

# Noise Study Report

Florida Department of Transportation

District 5

SR 535 PD&E Study

From US 192 to North of World Center Drive (SR 536)

Osceola and Orange Counties, Florida

Financial Project ID Number: 437174-2-22-01

ETDM Number: 14325

August 2024

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

## EXECUTIVE SUMMARY

This Noise Study Report (NSR) evaluates potential traffic noise impacts associated with the reconstruction and widening of SR 535 from US 192 (in Osceola County) to north of SR 536/World Center Drive (in Orange County).

This report documents a traffic noise study identifying noise-sensitive areas that may be affected by the proposed improvements and evaluates noise barriers as an abatement measure for sensitive areas expected to be impacted because of the planned improvements.

Traffic noise levels were predicted along the project corridor for the Existing Conditions, No Build, and the Preferred Alternative. Under the Preferred Alternative, traffic noise levels for the entire project are predicted to range from 56.0 dB(A) to 69.2 dB(A). The highest traffic noise level increase between the Existing Condition and the Preferred Alternative is 2.7 dB(A). Therefore, traffic noise levels throughout the project corridor are not expected to substantially increase above the existing conditions.

Under the Preferred Alternative, traffic noise levels with the planned improvements are predicted to approach or exceed the relevant NAC at one (1) special land use site, the Hawk's Landing Golf Club. The FDOT's special land use methodology was used to determine if the cost of a noise barrier would be reasonable for the impacted recreational areas based on the level of activity expected at the Hawk's Landing Golf Club. Based on the average usage that would be required to use this site per day, noise barriers at this site were determined to not be reasonable and are not recommended for further consideration or public input.

TABLE OF CONTENTS

**EXECUTIVE SUMMARY ..... I**

**1 INTRODUCTION..... 1-1**

1.1 PROJECT DESCRIPTION ..... 1-1

1.2 PURPOSE & NEED ..... 1-2

    1.2.1 *Transportation Demand*..... 1-3

    1.2.2 *Safety*..... 1-3

1.3 PROJECT STATUS..... 1-3

1.4 COMMITMENTS..... 1-4

1.5 ALTERNATIVES ANALYSIS SUMMARY..... 1-4

1.6 DESCRIPTION OF PREFERRED ALTERNATIVE ..... 1-5

    1.6.1 *Intersection Improvements*..... 1-6

    1.6.2 *Drainage* ..... 1-7

    1.6.3 *Right of way and Construction Cost*..... 1-10

**2 METHODOLOGY..... 2-1**

2.1 NOISE METRICS ..... 2-1

    2.1.1 *Traffic Data*..... 2-2

    2.1.2 *Elevation Data*..... 2-2

    2.1.3 *Receptor Data*..... 2-2

2.2 NOISE ABATEMENT CRITERIA ..... 2-3

2.3 NOISE ABATEMENT CONSIDERATION ..... 2-5

**3 TRAFFIC NOISE ANALYSIS..... 3-1**

3.1 FIELD MEASUREMENT DATA COLLECTION ..... 3-1

3.2 COMPUTER NOISE MODEL VALIDATION..... 3-3

3.3 PREDICTED NOISE LEVELS..... 3-5

    3.3.1 *The Cove*..... 3-14

**4 NOISE ABATEMENT ANALYSIS ..... 4-1**

4.1 SPECIAL LAND USE SITES..... 4-1

**5 CONCLUSIONS AND RECOMMENDATIONS..... 5-1**

**6 PUBLIC INVOLVEMENT ..... 6-1**

6.1 LAND USE COMPATIBILITY..... 6-1

6.2 PUBLIC OUTREACH..... 6-1

**7 CONSTRUCTION NOISE AND VIBRATION..... 7-1**

**8 REFERENCES..... 8-1**

**LIST OF FIGURES**

Figure 1-1: Project Location Map ..... 1-2  
Figure 1-2: Preferred Alternative Typical Section ..... 1-5  
Figure 1-3 - Osceola Parkway over SR 535 ..... 1-6  
Figure 1-4 - SR 417 over SR 535 ..... 1-6  
Figure 1-5: Preferred Alternative Ponds ..... 1-9  
Figure 3-1: Field Monitoring Locations ..... 3-2  
Figure 3-2: Noise Sensitive Receptor Locations ..... 3-6  
Figure 3-3: Predicted Noise Level Results ..... 3-8  
Figure 3-4: Predicted Noise Level Results Detailed - 1 of 4 ..... 3-10  
Figure 3-5: Predicted Noise Level Results Detailed - 2 of 4 ..... 3-11  
Figure 3-6: Predicted Noise Level Results Detailed - 3 of 4 ..... 3-12  
Figure 3-7: Predicted Noise Level Results Detailed - 4 of 4 ..... 3-13  
Figure 4-1: Analyzed Noise Barrier Location ..... 4-2

**LIST OF TABLES**

Table 1-1: Preferred Pond Alternatives ..... 1-8  
Table 1-2: Preferred FPC Site ..... 1-8  
Table 1-3: Cost Estimate ..... 1-10  
Table 2-1: Noise Activity Categories ..... 2-4  
Table 2-2: Typical Noise Levels ..... 2-5  
Table 3-1: Field Measurement Data ..... 3-4  
Table 3-2: Noise Receptor Locations and Noise Analysis Results ..... 3-9  
Table 6-1: Preferred Alternative Noise Impact Contour Distances ..... 6-1

**APPENDICES**

APPENDIX A: Traffic Data

APPENDIX B: Field Monitoring Worksheets

## 1 Introduction

In November 2017, the Florida Department of Transportation (FDOT) District Five (D-5) completed a Corridor Planning Study (CPS) to evaluate State Road 535 (SR 535) from US 192 in Osceola County to I-4 in Orange County. The purpose of the CPS was to identify specific problem areas along the corridor and evaluate multimodal alternatives that will be carried forward into future phases of project development in order to optimize the operations of the existing facility. Improvements identified as a result of the CPS included widening from four to six lanes, TSM&O and multimodal improvements, and intersection improvements (including innovative intersection designs).

FDOT D-5 is conducting a Project Development and Environment (PD&E) Study to evaluate the recommendations from the CPS including the widening of SR 535 from four to six lanes from US 192 in Osceola County to just north of World Center Drive (SR 536) in Orange County, approximately 2.35 miles. This Noise Study Report (NSR) evaluates potential traffic noise impacts associated with the reconstruction and widening of SR 535.

This report documents a traffic noise study identifying noise-sensitive areas that may be affected by the proposed improvements and evaluates noise barriers as an abatement measure for sensitive areas expected to be impacted because of the planned improvements. This traffic noise analysis was performed following the Code of Federal Regulations Title 23 Part 772 (23 CFR 772), *Procedures for Abatement of Highway Traffic Noise and Construction Noise*<sup>1</sup>, using methodology established by FDOT in the *Project Development and Environment Manual*<sup>2</sup>, Part 2, Chapter 18 (dated July 1, 2023).

### 1.1 Project Description

FDOT D-5 is conducting a PD&E Study to evaluate the widening of SR 535 from four to six lanes from US 192 in Osceola County to just north of World Center Drive (SR 536) in Orange County, approximately 2.35 miles as shown in Figure 1-1. SR 535 is known as Vineland Road in Osceola County and Kissimmee-Vineland Road in Orange County.

Within the study limits, SR 535 is a four-lane divided minor arterial facility that runs generally in a north south direction with an existing posted speed that varies from 45 to 50 mph. Bicycle and pedestrian facilities are provided intermittently throughout the study

area. There are three bridges over SR 535 within the study limits. Two of the existing bridges serve eastbound and westbound SR 417 and one of the existing bridges serves both eastbound and westbound Osceola Parkway. The existing drainage system collects roadway runoff in ditches and conveys the roadway runoff to treatment ponds via roadside ditches. The proposed improvements include widening SR 535 from four to six lanes, constructing signal improvements, providing drainage treatment and providing shared use paths along both sides of the roadway. The existing bridges will not be modified. The typical section for the preferred alternative is provided in **Figure 1 2**.



**Figure 1-1:Project Location Map**

## 1.2 Purpose & Need

The purpose and need of the project is to accommodate future projected traffic demand and improve safety.

### **1.2.1 Transportation Demand**

In the existing condition, the section of SR 535 from US 192 to Kyngs Heath Road operates at a Level of Service (LOS) D with an Annual Average Daily Traffic (AADT) of 28,300; the section from Kyngs Heath Road to Poinciana Boulevard operates at LOS D with an AADT of 26,900; the section from Poinciana Boulevard to Polynesian Isle Boulevard operates at LOS D with an AADT of 46,800; the section from Polynesian Isle Boulevard to World Center Drive operates at LOS D with an AADT of 44,300.

Based on the approved Orange County and Osceola County Comprehensive Plan's future land-uses that are included in the Central Florida Regional Planning Model (CFRPM) version 7.0, in the future year (2045) No-Build condition, the section of SR 535 from US 192 and Kyngs Heath Road is projected to operate at LOS F with an AADT of 42,000; the section from Kyngs Heath Road to Poinciana Boulevard is projected to operate at LOS E with an AADT of 40,000; the section from Poinciana Boulevard to Polynesian Isle Boulevard is projected to operate at LOS F with an AADT of 69,000; the section from Polynesian Isle Boulevard to World Center Drive is projected to operate at LOS F with an AADT of 66,000.

### **1.2.2 Safety**

A total of 981 crashes were reported on SR 535 from US 192 to Lake Bryan Beach Boulevard in the five-year period from 2014 through 2018. Of those reported crashes, 463 (47%) resulted in injury and four (4) resulted in a fatality. The most frequent crash type was rear end with 605 (62%) total crashes, indicating congestion. Sideswipe crashes were the second highest with 106 (11%), followed by left-turn with 93 (9%) total crashes. Of the 981 crashes, 602 (61%) crashes occurred during daylight conditions. The crash rates along this segment of SR 535 exceed the FDOT statewide averages for similar facilities.

### **1.3 Project Status**

The project is within the jurisdiction of MetroPlan Orlando. The MetroPlan Orlando 2045 Cost Feasible Plan (CFP) includes widening of SR 535 from US 192 in Osceola County to SR 536 in Orange County in years 2031 to 2035 (construction). The SR 535

improvements are funded for design in the Florida Department of Transportation (FDOT) 2024-2029 Five-Year Work Program and MetroPlan Orlando 2023-2028 Transportation Improvement Program (TIP). This project was screened in the Efficient Transportation Decision Making (ETDM) system as ETDM #14325.

#### **1.4 Commitments**

FDOT has made a series of commitments and recommendations during this PD&E Study. The following sections summarize the commitments and recommendations that will be adhered to during the future transportation phases.

- The most recent version of the USFWS Standard Protection Measures for the Eastern Indigo Snake will be utilized during construction.
- FDOT will require contractors to remove garbage daily from the construction site or use bear proof containers for securing of food and other debris from the project work area to prevent these items from becoming an attractant for the Florida black bear (*Ursus americanus floridanus*). Any interaction with nuisance bears will be reported to the FWC Wildlife Alert hotline 888-404-FWCC (3922).

#### **1.5 Alternatives Analysis Summary**

The following alternatives were evaluated during the study:

- 'No-Build' Alternative
- Construction ('Build') Alternatives

The build alternative consists of widening SR 535 from four to six lanes. The study evaluated a range of typical section and intersection alternatives including inside widening and outside widening of the existing roadway. The build alternative analysis included the evaluation of open and closed stormwater drainage conveyance systems together with the evaluation of pond site locations. The study also evaluated Transportation System Management and Operations (TSMO) and multimodal improvements.

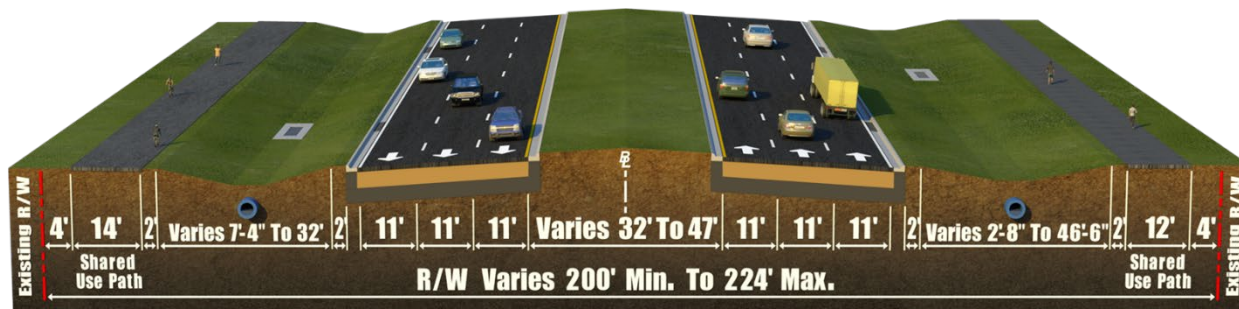


### 1.6 Description of Preferred Alternative

The Preferred Alternative consists of inside widening from four to six lanes with a shared use path along both sides and intersection improvements. The preferred alternative is shown **Figure 1-2**.

The Preferred Alternative has a design speed of 45-miles per hour (mph) and consists of full reconstruction with the additional lanes constructed towards the median. The typical section consists of three (3) 11-foot travel lanes in each direction separated by a 32-foot to 47-foot median with a 14-foot shared use path on the west side and a 12-foot shared use path on the east side of the roadway. The Preferred Alternative will be constructed within the existing right-of-way width of 200-feet to 224-feet. Swales with ditch bottom inlets in conjunction with flume inlets at the curb line will be provided for drainage conveyance. Stormwater attenuation and floodplain compensation will be provided.

**Figure 1-2: Preferred Alternative Typical Section**



SR 535. Roadway improvements would not require extending or reconstructing the existing bridges over SR 535 (One (1) bridge carries Osceola Parkway traffic over SR 535 and two (2) bridges carry SR 417) as all improvements will fit under the existing structures (see **Figure1-3** and **Figure 1-4**).

Figure 1-3 - Osceola Parkway over SR 535

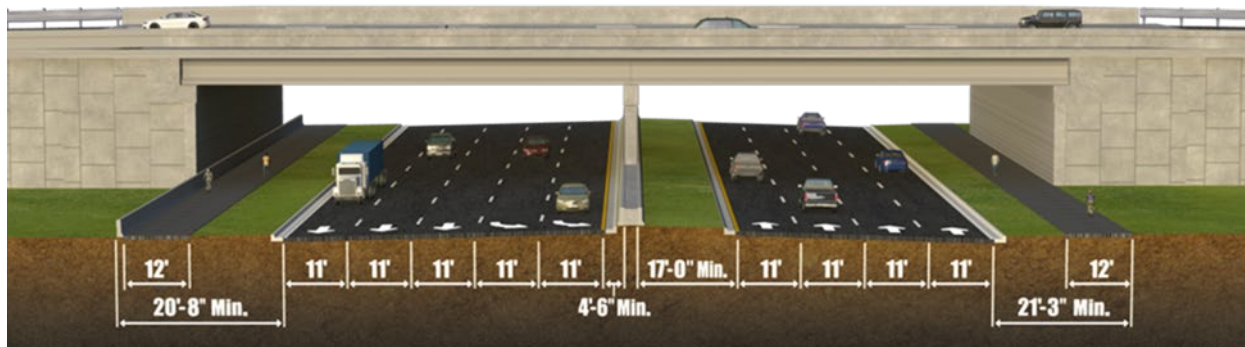
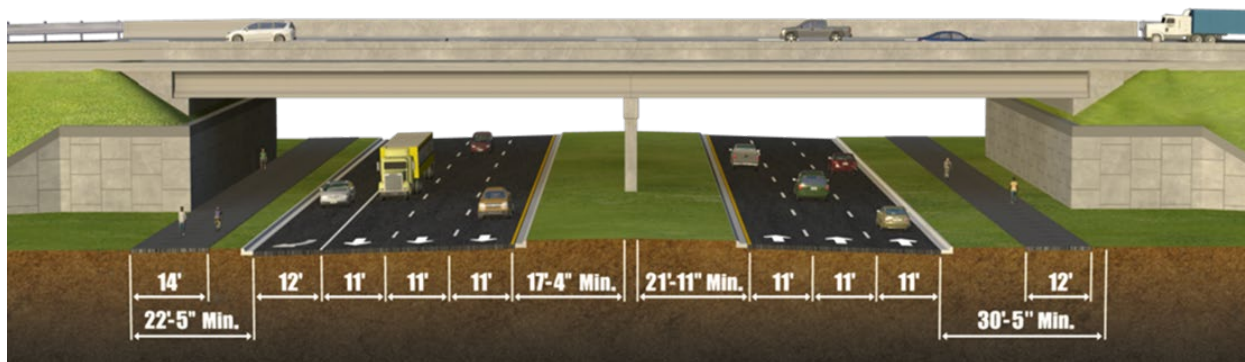


Figure 1-4 - SR 417 over SR 535



### 1.6.1 Intersection Improvements

The Preferred Alternative will also implement intersection improvements including the following innovative intersection concepts.

- Polynesian Isle Boulevard Partial Median U-Turn (PMUT): Implementation of the PMUT involves the removal of northbound and southbound direct left turn movements from SR 535 to Polynesian Isle Boulevard and the addition of signalized U-turns at the existing median openings located just north and south of the intersection along SR 535 to accommodate vehicles wishing to travel east or west on Polynesian Isle Boulevard.
- International Drive Partial Displaced Left Turn (PDLT). Implementation of the PDLT involves the removal of direct eastbound and westbound left turns from International Drive at SR 535 with the displaced left turns installed on both legs International Drive. The northbound and southbound left turn movements for SR 535 continue to take place at the main intersection.

- SR 536 (World Center Drive) Partial Displaced Left Turn (PDLT). Implementation of the PDLT involves the removal and replacement of direct northbound and southbound left turns from SR 535 at SR 536 with the displaced left turns installed on both legs of SR 535. The eastbound and westbound left turn movements for the SR 536/World Center Drive continue to take place at the main intersection.

### 1.6.2 Drainage

There are 4 basins in the existing and proposed condition, and all basins drain to permitted stormwater systems in the existing condition (see **Table 1-1**). Where feasible, stormwater management facilities have been recommended within existing FDOT or County right-of-way (R/W). Below is a summary of the preferred pond alternatives (see **Figure 1-5**).

- Basin 1: Alternative 1A is the Preferred Alternative for Basin 1. Alternative 1A consists of an existing wet detention pond (identified as Exist. Pond 1-1) within FDOT R/W to provide the required water quality treatment and attenuation volumes.
- Basin 2: Alternative 2A is the Preferred Alternative for Basin 2. Alternative 2A consists of 2 ponds, one existing wet detention pond within existing FDOT R/W (identified as Exist. Pond 2-1) interconnected with a second wet detention pond (identified as Pond 2-2) to provide the required water quality treatment and attenuation volumes. Since there is insufficient area within the existing FDOT R/W to provide a stormwater management alternative to meet water quality treatment and attenuation requirements, Pond Alternative 2A will require acquisition of R/W.
- Basin 3: Alternative 3A is the Preferred Alternative for Basin 3. Alternative 3A consists of 2 ponds, one existing wet detention pond within existing FDOT R/W (identified as Exist. Pond 3-1) interconnected with a second wet detention pond (identified as Pond 3-2) to provide the required water quality treatment and attenuation volumes. Since there is insufficient area within the existing FDOT R/W to provide a stormwater management alternative to meet water quality treatment and attenuation requirements, Pond Alternative 3A will require acquisition of R/W.
- Basin 4: Alternative 4A is the Preferred Alternative for Basin 4. Alternative 4A consists of an existing wet detention pond (identified as Exist. Pond 4-1) within existing R/W and easement to provide the required water quality treatment and attenuation volumes.

**Table 1-1: Preferred Pond Alternatives**

Basin	Preferred Alternative	Ponds	Type	R/W Req'd.	Remarks
1	1A	Exist. Pond 1-1	Wet	0.0	Exist. pond sufficient. Reduced drainage area (30.94 ac to 29.16 ac) from exist. to proposed conditions. Increased freeboard in exist. pond. Pond within exist. R/W
2	2A	Exist. Pond 2-1 and Pond 2-2	Wet	3.0	Interconnected ponds to provide required water quality treatment and attenuation. Utilize Exist. Pond 2-1 outfall to Shingle Creek. Exist. Pond 2-1 within exist. R/W. Estimated R/W needs for Pond 2-2 provided (excluding public R/W used for pond).
3	3A	Exist. Pond 3-1 and Pond 3-2	Wet	3.5	Interconnected ponds to provide required water quality treatment and attenuation. Utilize Exist. Pond 3-1 and Pond 3-2 outfalls to Shingle Creek. Exist. Pond 3-1 within exist. R/W. Estimated R/W needs for Pond 3-2 provided (excluding public R/W used for pond).
4	4A	Exist. Pond 4-1	Wet	0.0	Exist. pond sufficient. Reduced drainage area (8.70 ac to 7.63 ac) from exist. to proposed conditions. Increased freeboard in exist. pond. Pond within exist. R/W

An analysis of floodplain impacts and Floodplain Compensation (FPC) alternatives was performed. Project improvements will impact the 100-year floodplain as a result of longitudinal impacts and transverse impacts. The preferred FPC alternative and anticipated right of way needs associated with the preferred alternative are provided in **Table 1-2**.

**Table 1-2: Preferred FPC Site**

Name	Floodplain Impacts (ac-ft)	Floodplain compensation Volume Provided (ac-ft)	Estimated Pond R/W Req'd. (including access) (ac)
FPC-1	8.89	14.45	4.3



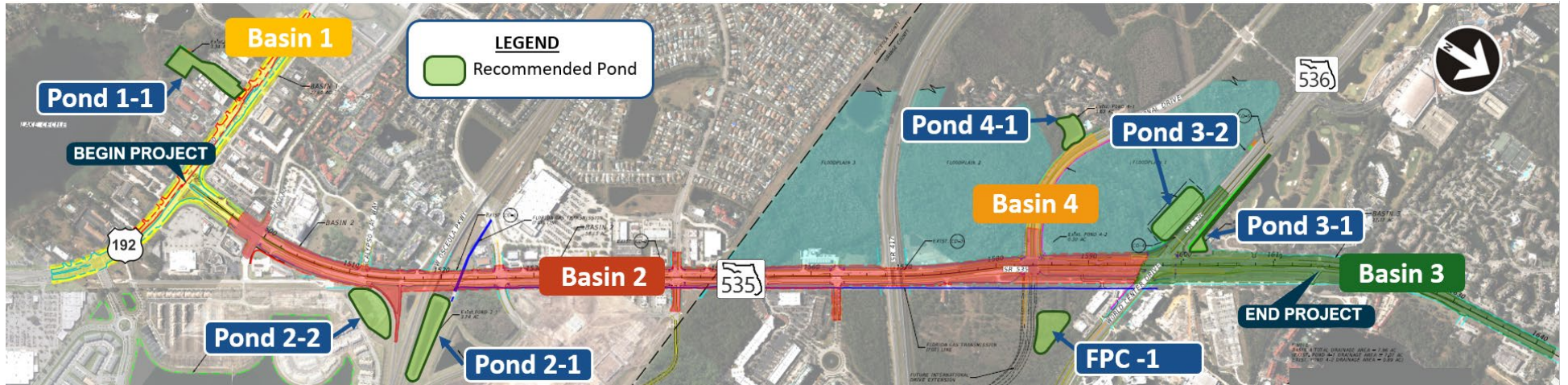


Figure 1-5: Preferred Alternative Ponds

### 1.6.3 Right of way and Construction Cost

SR 535 has an existing right-of-way of 224 feet which is ample right-of-way to accommodate the Preferred Alternative. Some right-of-way impacts will be required to accommodate intersection improvements at the International Drive and World Center Drive (SR 536) intersections and for offsite ponds. Approximately 11.5 acres of right-of-way impacts (excluding public R/W required) are anticipated as a result of the preferred alternative. Approximately 0.7 acres are associated with improvements at the SR 535/International Drive and SR 535/World Center Drive (SR 536) intersections. Additionally, approximately 10.8 acres are associated with the required stormwater and floodplain compensation ponds (excluding public R/W required). A total of 8 parcels are anticipated to be impacted from the preferred alternative. See **Table 1-3** for cost estimate.

**Table 1-3: Cost Estimate**

	Cost
Construction	\$76.5M
R/W	\$38.1M
Utility Relocation	\$7M
Sub Total	\$121.6M
Design (15%)	\$11.5M
CEI (10%)	\$7.7M
Total Estimated Project Cost	\$140.8M

## 2 Methodology

This noise analysis was conducted in accordance with *23 CFR Part 772: Procedures for “Abatement of Highway Traffic Noise and Construction Noise, dated July 13, 2010”*<sup>1</sup>; *“Chapter 18 - Highway Traffic Noise of the FDOT Project Development and Environment Manual, dated July 1, 2023”*<sup>2</sup>; *“Highway Traffic Noise: Analysis and Abatement Guidance, dated August 20”*<sup>3</sup>; and the *“FDOT Traffic Noise Modeling and Analysis Practitioners Handbook, dated December 31, 2018”*<sup>4</sup>.

The procedures, methods, and results of this analysis are summarized as follow:

- Identification of noise-sensitive receptor sites,
- Field measurement of noise levels and noise model validation,
- Prediction of existing and future noise levels,
- Assessment of traffic noise impacts, and
- Consideration of noise abatement measures.

This noise analysis utilized CAD files for the Preferred Alternative to evaluate traffic noise impacts and noise abatement analysis within the limits of the project. Based on the available data, this noise analysis provides a baseline for potential traffic noise impacts associated with the planned improvements and recommended noise barrier locations, if any, for any further consideration in design. The FHWA’s Traffic Noise Model (TNM) Version 2.5 (February 2004) was used to predict traffic noise levels and to analyze the effectiveness of noise abatement. This model estimates the noise level at noise sensitive receptor sites from traffic noise sources (i.e., roadways). Model-predicted noise levels are influenced by several factors, such as vehicle speed and distribution of vehicle types. Noise levels are also affected by characteristics of the source to receptor site path, including the effects of intervening barriers, houses, different ground surfaces and topography.

### 2.1 Noise Metrics

The noise levels presented in this report are expressed in dB(A) which is the scale that most closely approximates the range of frequencies a human ear can hear. All noise levels are reported as equivalent levels [Leq(h)], which is the equivalent sound level that

contains the same acoustic energy as an actual time-varying sound level over a period of one hour.

### 2.1.1 Traffic Data

Traffic data used in the TNM models is based upon both Level of Service (LOS) C that was obtained from the “June 2023 FDOT Quality/Level of Service Handbook<sup>5</sup>” and the Turning Movement Volumes (TMVs) sourced from the *March 2023 SR 535 Project Traffic Analysis Report (PTAR) FM# 437174-2 (SR 535 PTAR)*. Noise analysis was performed for Existing and Design Year No Build and Build conditions. Design Year is defined as opening year plus 20 years. A vehicle volume resulting in LOS C operating conditions is considered the maximum volume that allows vehicles to travel at the speed limit and, consequently, produces the worst-case traffic noise environment. For both Existing (2022) and Build years (Design Year 2045), traffic data was selected according to *FDOT’s Traffic Noise Modeling & Analysis Practitioners Handbook* which compares TMV volumes to LOS C volume from the *2023 FDOT Quality/Level of Service Handbook*. If TMVs were higher than LOS C volume, LOS C volumes were selected. If LOS C volumes were higher than TMVs, TMV volumes were selected. A table showing the comparison and selections is presented in **Appendix A**. For No Build, only LOS C volumes were selected. Furthermore, traffic factors for the project corridor were obtained from classification counts collected for the SR 535 PTAR. Traffic data and traffic factors used for this analysis are presented in **Appendix A**.

### 2.1.2 Elevation Data

The relationship between the elevation of the road and ground at nearby receptor sites can affect predicted noise levels and the effectiveness of potential noise barriers. Roadway elevations for SR 535 were estimated based on information from survey data provided by FDOT, Google Earth Pro, LIDAR, and/or the U.S. Geological Survey. Ground elevations of other features were also based on these data sources.

### 2.1.3 Receptor Data

Model receptors are used in TNM to predict resulting traffic noise levels at nearby noise sensitive sites and to evaluate the predicted effectiveness of noise barriers. These sites were chosen in accordance with *Chapter 18 of the FDOT PD&E Manual*. Factors that



were considered include: noise sensitivity, proximity to project improvements, frequent outdoor usage, and homogeneity (i.e., the site is representative of other nearby sites). After a desktop analysis of the project corridor and a field review, 19 model receptors representing noise sensitive sites have been selected for this analysis. The number of existing residences represented by each model receptor varies according to site conditions. For residences, traffic noise levels are predicted for the backyards of the residences. Model receptors are in areas of use closest to SR 535. All receptor sites are modeled five feet above ground.

## 2.2 Noise Abatement Criteria

FDOT uses Noise Abatement Criteria (NAC) established by the FHWA. Specific NAC levels have been developed for five of the FHWA’s seven Activity Categories (see **Table 2-1**). These NAC levels represent maximum traffic noise level conditions established for each land use category at which abatement should be considered. Noise abatement measures must be considered when predicted noise levels approach or exceed the FHWA NAC levels or when a substantial noise increase occurs. The FDOT defines “approach” as within one (1) dB(A) of the FHWA criteria. A substantial noise increase is defined as a predicted increase of 15 dB(A) or more above the existing noise levels resulting from a transportation improvement project. As shown in **Table 2-1**, the criteria vary according to a property’s Activity Category. Typical noise levels associated with common indoor and outdoor activities are shown in **Table 2-2**.

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**Table 2-1: Noise Activity Categories**

ACTIVITY CATEGORY	ACTIVITY Leq(h) <sup>1</sup>		EVALUATION LOCATION	DESCRIPTION OF ACTIVITY CATEGORY
	FHWA	FDOT		
A	57	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B <sup>2</sup>	67	66	Exterior	Residential
C <sup>2</sup>	67	66	Exterior	Active sports areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E <sup>2</sup>	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	–	–	–	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	–	–	–	Undeveloped lands that are not permitted.

(Based on Table 1 of 23 CFR Part 772)

<sup>1</sup> The Leq(h) Activity Criteria values are for impact determination only and are not design standards for noise abatement measures.

<sup>2</sup> Includes undeveloped lands permitted for this activity category.

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**Table 2-2: Typical Noise Levels**

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

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

### 2.3 Noise Abatement Consideration

Noise abatement is considered when the NAC is approached or exceeded. The most common and effective noise abatement measure for projects such as this is construction of a noise barrier as close as possible to the impacted sites or along the outside edges of the roadway. Noise barriers reduce noise by blocking the sound path between a roadway and a noise-sensitive area. To be effective, noise barriers must be long, continuous, and have sufficient height to block the path between the noise source and the receptor site. Other potential noise abatement alternatives include traffic management, creation of alternative roadway alignments, buffer zones, and land use controls.

Noise barriers are evaluated as follows:

- Primary consideration is generally given to ground-mounted noise barriers located outside of the roadway's clear recovery zone and as close as possible within the roadway right-of-way to the impacted noise-sensitive sites. Heights ranging from 8 to 22 feet are evaluated in 2-foot increments. According to the FDOT *Design Manual*<sup>6</sup> referenced for this analysis, a noise barrier located outside of the clear zone should not exceed a maximum height of 22 feet.
- If a ground-mounted noise barrier located outside of the roadway's clear recovery zone cannot provide at least a 5 dB(A) reduction to an impacted noise-sensitive site or is not construction-feasible, then a noise barrier located along the highway shoulder would be evaluated. According to the FDOT *Design Manual*<sup>6</sup>, a shoulder-mounted noise barrier should not exceed 14 feet in height when on fill (i.e., embankment) or 8 feet in height when on structure.
- Finally, the length and height of the noise barrier is optimized based on the benefit provided at residences where predicted noise levels approach or exceed the NAC.

A wide range of factors are used to evaluate the feasibility and reasonableness of noise abatement measures.

Feasibility primarily concerns the ability to reduce noise levels by at least 5 dB(A) at the impacted receptor sites using standard construction methods and techniques. In order to be considered feasible according to FDOT criteria, a noise barrier must provide a 5 dB(A) reduction for at least two impacted receptors. Engineering considerations typically assessed during the feasibility analysis include access, drainage, utilities, safety, and maintenance.

Reasonableness implies that common sense and good judgment were applied in a decision related to noise abatement. A reasonableness analysis includes consideration of the cost of abatement, the amount of noise abatement benefit, and consideration of the viewpoints of the impacted and benefited property owners and residents.

FDOT's current statewide average noise barrier unit cost of \$30 per square-foot (sf) is used to develop preliminary estimated noise barrier costs. To be deemed reasonable at residential properties, a noise barrier should, at a minimum, meet two important criteria used by FDOT:

- The estimated construction cost cannot exceed the reasonable cost criteria of \$42,000 per benefited receptor site, and
- The noise barrier must reduce noise levels by at least 7 dB(A) at one or more impacted receptor sites.

The reasonableness and feasibility of noise abatement measures for non-residential/special use sites are assessed in accordance with the FDOT report *A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations*<sup>7</sup> (updated July 22, 2009).

Noise barriers are evaluated based on the benefit provided to impacted noise sensitive locations where the predicted Preferred Alternative traffic noise levels approach or exceed the NAC or result in a substantial increase above existing worst-case traffic noise levels. For the process of evaluating the most cost-effective noise barrier for the maximum number of impacted noise-sensitive sites, various noise barrier design concepts are evaluated to determine the most effective location, length, and height. At some locations, a noise barrier may also benefit additional non-impacted noise-sensitive sites. Furthermore, 23 CFR 772 does not require consideration of noise abatement for non-impacted sites. Thus, noise barriers are not specifically designed to benefit them.

### 3 Traffic Noise Analysis

The traffic noise analysis includes existing field-monitored noise levels, noise model validation, and prediction of noise levels for design year (2045) of the No Build and Preferred Alternative. Field monitoring sites representing noise-sensitive sites were established by aerial imagery, field reviews, and in coordination with FDOT. The following describes the field monitoring sites:

- FM-1: Exterior areas of use (mainly hotels) adjacent to US 192
- FM-2: Exterior areas of use and homes adjacent to SR 535 between US 192 and Calypso Cay Way.
- FM-3: Exterior areas of use (mainly restaurants) adjacent to SR 535 between Calypso Cay Way and N Poinciana Boulevard.
- FM-4: Areas of public use adjacent to SR 535 between World Center Drive and Lake Bryan Beach Boulevard.
- FM-5: Exterior areas of use (mainly hotels) adjacent to World Center Drive between SR 535 and International Drive.

#### 3.1 Field Measurement Data Collection

All field measurements were conducted following procedures documented in *FHWA's Measurement of Highway-Related Noise*<sup>8</sup> and the *Traffic Noise Modeling and Analysis Practitioner's Handbook*<sup>4</sup>. The results for all of the field measurements are provided in **Table 3-1**. Field monitoring sheets documenting all monitoring events are provided in **Appendix C**.

All measurements were collected using a CEL-246 noise meter. The noise meter was calibrated before and after all measurements using a field calibrator. All measurements were taken at a height of 5 feet above ground level. Traffic data, including vehicle counts, classifications, and speeds, were collected during the sampling periods by the field team.

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SECTION 3 – TRAFFIC NOISE ANALYSIS



Figure 3-1: Field Monitoring Locations

### 3.2 Computer Noise Model Validation

Site conditions and traffic data gathered during the field measurements were used to develop inputs to the FHWA's TNM 2.5 for computer models representative of the field conditions. Additional geometric information necessary for these models were developed from aerial imagery and MicroStation files of the existing conditions in the project study area. The TNM results were then compared to the noise level data collected during the field measurements (see **Table 3-1**). The model inputs for the field conditions were deemed to be within an acceptable level of accuracy since the predicted noise levels are within  $\pm 3.0$  dB(A) of the measured noise levels in accordance with *Chapter 18 of the FDOT PD&E Manual*<sup>2</sup>, and the *2018 FDOT Traffic Noise Modeling and Analysis Practitioner's Handbook*<sup>4</sup>. Thus, further use of the TNM model on this project is supported.



**Table 3-1: Field Measurement Data**

FIELD RECEPTOR SITE NUMBER - LOCATION	SAMPLE RUN	DATE/TIME	DISTANCE FROM EDGE OF NEAR TRAVEL LANE (Feet)	MEASURED NOISE LEVEL [dB(A)]	MODELED TRAFFIC NOISE LEVEL [dB(A)]	DIFFERENCE (Measured - Modeled) [dB(A)]
FR-1	A	8/9/2022 12:22 pm	50	58.4	60.4	-2.0
			100	57.7	57.4	0.3
	B	8/9/2022 12:33 pm	50	61.2	58.2	3.0
			100	58.2	55.5	2.7
	C	8/9/2022 12:44 pm	50	59.4	59.3	0.1
			100	59.0	56.6	2.4
FR-2	A	8/9/2022 1:35 pm	50	65.2	67.5	-2.3
			100	60.8	63.2	-2.4
	B	8/9/2022 1:45 pm	50	61.7	64.1	-2.4
			100	60.5	61.1	-0.6
	C	8/9/2022 1:55 pm	50	63.3	65.4	-2.1
			100	59.2	61.6	-2.4
FR-3	A	8/9/2022 2:28 pm	50	66.3	66.6	-0.3
			100	64.4	62.2	2.2
	B	8/9/2022 2:39 pm	50	64.8	65.0	-0.2
			100	60.1	60.4	-0.3
	C	8/9/2022 2:50 pm	50	64.7	66.5	-1.8
			100	62.7	62.1	0.6
FR-4	A	8/9/2022 3:19 pm	50	65.3	68.0	-2.7
			100	63.0	63.8	-0.8
	B	8/9/2022 3:29 pm	50	64.5	67.3	-2.8
			100	63.9	63.1	0.8
	C	8/9/2022 3:39 pm	50	65.8	68.3	-2.5
			100	64.0	64.0	0.0
FR-5	A	8/9/2022 12:48 pm	50	65.1	65.2	-0.1
			100	61.6	61.1	0.5
	B	8/9/2022 12:58 pm	50	64.6	65.0	-0.4
			100	60.5	60.7	-0.2
	C	8/9/2022 1:09 pm	50	63.3	64.8	-1.5
			100	59.7	60.8	-1.1

### 3.3 Predicted Noise Levels

Within the project limits, noise-sensitive land uses that are specified in the NAC include:

- **Activity Category B** (residential areas) – Includes 32 single-family homes in the project corridor, part of The Cove.
- **Activity Category C** (exterior areas of public use) – Includes the Hawk’s Landing Golf Course
- **Activity Category E** (Outdoor use areas, e.g. restaurants) – Four (4) hotels with exterior areas of use were identified within the project area which include the Golden Link Hotel, Embassy Suites, Hampton Inn Suites, and Buena Vista Suites. Five (5) restaurants with exterior seating were located within the project corridor which include Smokey Bones, Miller’s Alehouse, Starbucks, Twistee Treat, and Wendy’s.

No Activity Category A lands, which are sites on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential for the area to continue to serve its intended purpose, are found along the project corridor.

No Activity Category D lands, which are interior locations that require a lower noise threshold (e.g. Auditoriums, medical facilities, libraries, recording studios), are found along the project corridor.

Nineteen (19) model receptor locations which would represent 42 noise-sensitive sites as described previously were input into the TNM model. These locations are described in **Table 3-2**. The identifiers for each model receptor generally include the first several letters of the community or site name along with sequential numbering for sites where more than one model receptor is located. Each line item in the table is a single receptor which represents one or more noise-sensitive site. These locations are shown in **Figure 3-2**.

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SECTION 3 – TRAFFIC NOISE ANALYSIS

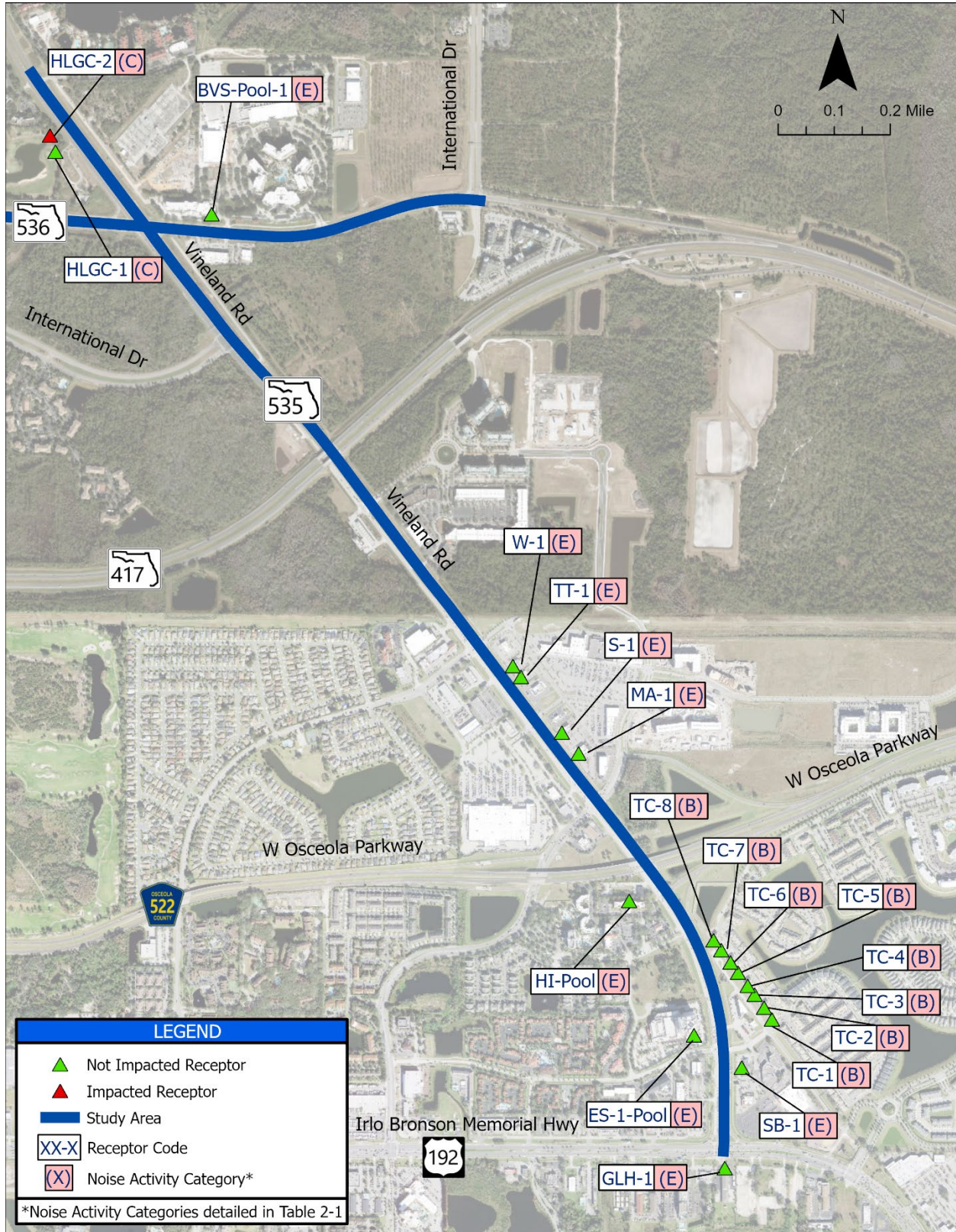


Figure 3-2: Noise Sensitive Receptor Locations



Traffic noise levels were predicted along the project corridor for the Existing Conditions, No Build, and the Preferred Alternative, see **Figure 3-3** for results of the noise analysis and the design of the Preferred Alternative, and **Figures 3-4 to 3-8** for a detailed view of the noise sensitive sites. Existing condition predicted noise levels for the entire project range from 54.3 dB(A) to 67.8 dB(A). Under No Build, traffic noise levels for the entire project are predicted to range from 55.5 dB(A) to 68.9 dB(A). Under the Preferred Alternative, traffic noise levels for the entire project are predicted to range from 56.0 dB(A) to 69.2 dB(A). The highest traffic noise level increase between the Existing Condition and the Preferred Alternative is 2.7 dB(A). Therefore, traffic noise levels throughout the project corridor are not expected to substantially increase above the existing conditions.

Under the Preferred Alternative, traffic noise levels with the planned improvements are predicted to approach or exceed the relevant NAC at one (1) special use site, the Hawk's Landing Golf Course. The feasibility and reasonableness of providing a noise barrier to reduce traffic noise has been evaluated for the Hawk's Landing Golf Club.

It should be noted that, at the time of submittal for this NSR, progress has been monitored for the site being planned for development on the southeast corner of SR 535 and World Center Drive. No official Building Permits have been approved for construction. However, generalized future noise impact contours for the properties in the immediate vicinity of the project have been developed for Noise Abatement Activity Categories B/C and E (i.e., residential/other sensitive land uses and sensitive commercial, respectively). This is further discussed and presented in **Section 6**.

SECTION 3 – TRAFFIC NOISE ANALYSIS

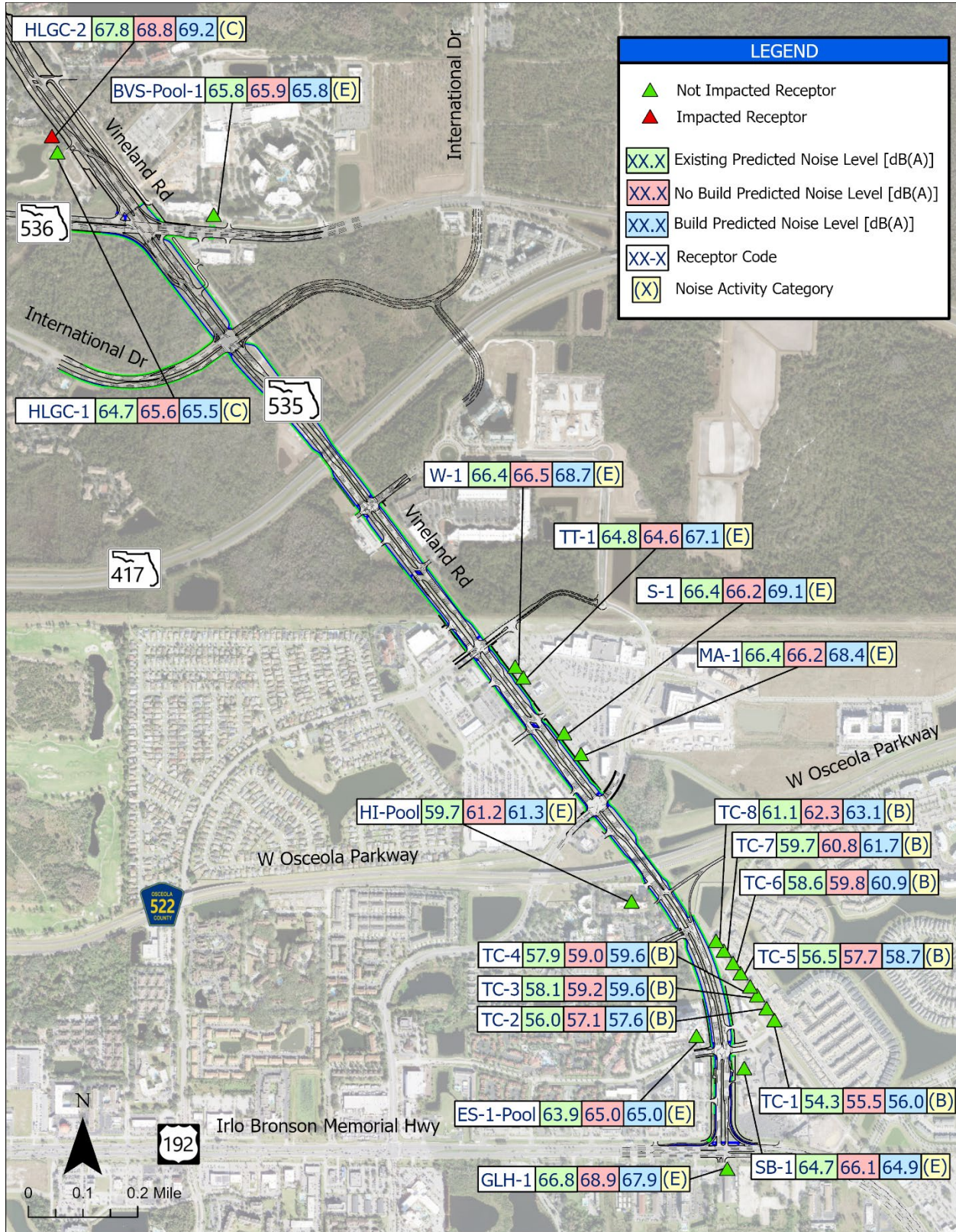


Figure 3-3: Predicted Noise Level Results



Table 3-2: Noise Receptor Locations and Noise Analysis Results

Representative Model Receptor	Site	Location (Station)	Description (Activity Category)	FDOT Noise Abatement [dB(A)]	Number of Noise Sensitive Sites	Distance to Nearest Traffic Lane (Feet)	Predicted Traffic Noise Level [Leq(1h), dB(A)]		
							Existing	No Build	Build
GLH-1	4914 W IRLO BRONSON MEM HWY	100+50.00	Exterior Use (E)	71	1	130	66.8	68.9	67.9
SB-1	2911 VINELAND RD	104+50.00	Exterior Use (E)	71	1	155	64.7	66.1	64.9
ES-1-Pool	4955 KYNGS HEATH RD	111+50.00	Exterior Use (E)	71	1	135	63.9	65.0	65.0
TC-1	4969 WINDERMERE AVE	112+50.00	Residential (B)	66	4	525	54.3	55.5	56.0
TC-2	4961 WINDERMERE AVE	113+25.00	Residential (B)	66	4	485	56.0	57.1	57.6
TC-3	4951 WINDERMERE AVE	114+50.00	Residential (B)	66	4	390	58.1	59.2	59.6
TC-4	4943 WINDERMERE AVE	115+50.00	Residential (B)	66	4	350	57.9	59.0	59.6
TC-5	4931 WINDERMERE AVE	116+75.00	Residential (B)	66	4	275	56.5	57.7	58.7
TC-6	4923 WINDERMERE AVE	117+75.00	Residential (B)	66	4	225	58.6	59.8	60.9
TC-7	4911 WINDERMERE AVE	119+15.00	Residential (B)	66	4	170	59.7	60.8	61.7
TC-8	4903 WINDERMERE AVE	119+85.00	Residential (B)	66	4	100	61.1	62.3	63.1
MA-1	3151 VINELAND RD	141+15.00	Exterior Use (E)	71	1	145	66.4	66.2	68.4
S-1	3173 VINELAND RD	144+50.00	Exterior Use (E)	71	1	115	66.4	66.2	69.1
TT-1	3269 VINELAND RD	151+15.00	Exterior Use (E)	71	1	150	64.8	64.6	67.1
W-1	3271 VINELAND RD	152+50.00	Exterior Use (E)	71	1	120	66.7	66.5	68.7
HLGC-1	8701 WORLD CENTER DR	218+15.00	Public Area (C)	66	1	215	64.7	65.6	65.5
HLGC-2		220+15.00				130	<b>67.8</b>	<b>68.8</b>	<b>69.2</b>
BVS-Pool-1	8203 WORLD CENTER DR	2049+00.00	Exterior Use (E)	71	1	125	65.8	65.9	65.8
HI-Pool	4971 CALYPSO CAY WAY	127+50.00	Exterior Use (E)	71	1	250	59.7	61.2	61.3





Figure 3-4: Predicted Noise Level Results Detailed - 1 of 4





Figure 3-5: Predicted Noise Level Results Detailed - 2 of 4



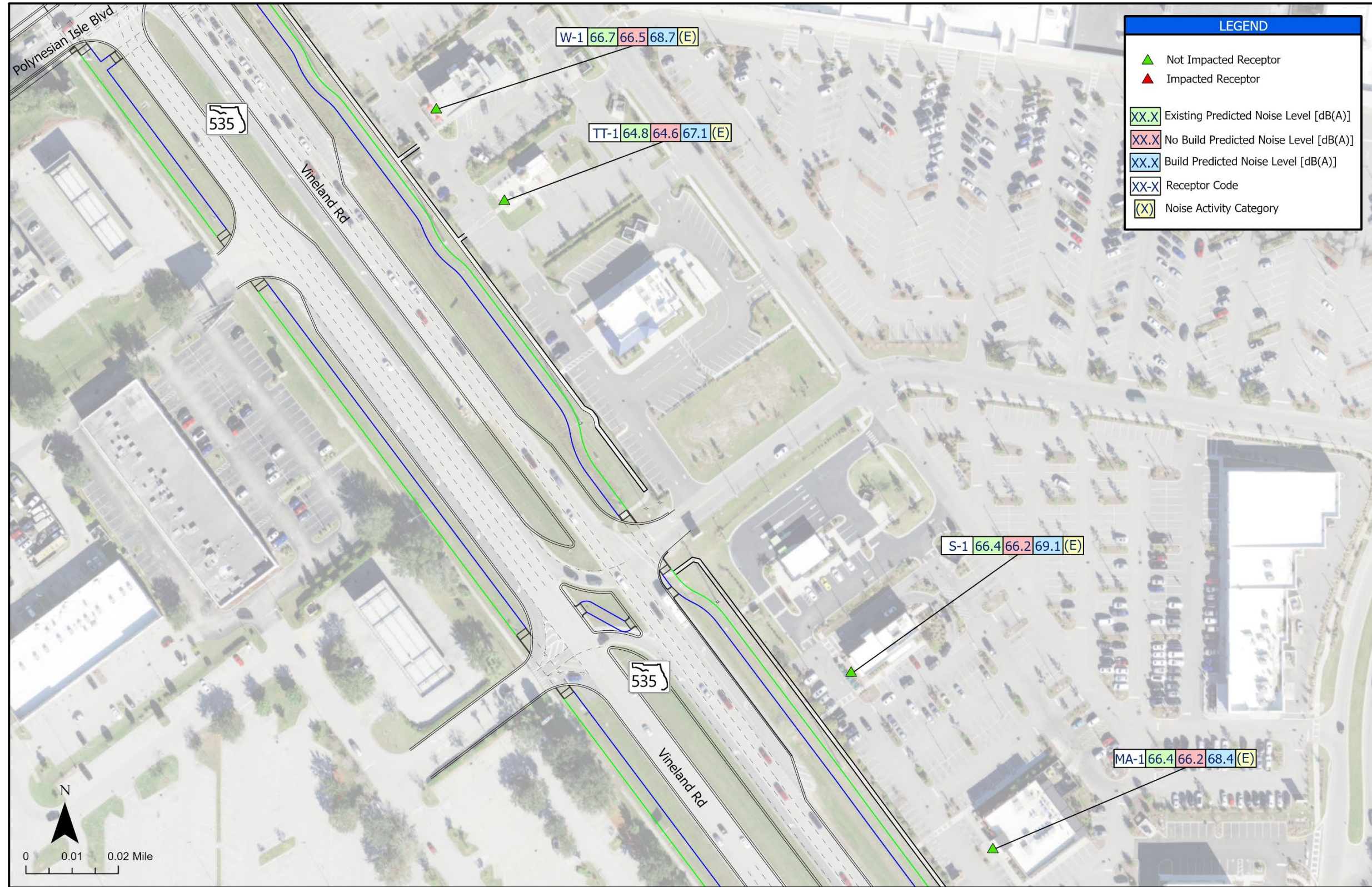


Figure 3-6: Predicted Noise Level Results Detailed - 3 of 4





Figure 3-7: Predicted Noise Level Results Detailed - 4 of 4



### 3.3.1 The Cove

The SR 535 Road residential community consists of a large gated community with multiple single-family homes located on Windermere Avenue adjacent to Old Vineland Road and Kyngs Heath Road. With the planned improvements, the nearest travel lane remains at an equal distance from the residences as widening is occurring on the interior of the roadway. The Preferred Alternative traffic noise levels at these homes are predicted to range from 56.0 dB(A) to 63.1 dB(A). Thirty-two (32) homes within the gated community, all adjacent to Old Vineland Road are not expected to experience noise levels with the planned improvements that approach or exceed the NAC [66.0 dB(A)]. The predicted Preferred Alternative traffic noise levels are expected to increase by no more than 2.3 dB(A) above the existing levels.

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## 4 Noise Abatement Analysis

Following FDOT policy, it is required that the reasonableness and feasibility of noise abatement be considered when the FHWA NAC is approached or exceeded. The most common and effective noise abatement measure for projects such as this is the construction of noise barriers. The following sections describes the noise abatement analysis performed for the impacted noise sensitive site/area by evaluating the cost reasonableness criteria of providing a noise barrier at the impacted special land use site.

### 4.1 Special Land Use Sites

The FDOT's special land use methodology was used to determine if the cost of a noise barrier would be reasonable for the impacted recreational areas based on the level of activity expected at the Hawk's Landing Golf Club. The impacted special use area includes the tee box of the 13<sup>th</sup> Hole of the Hawk's Landing Golf Club. Based on FDOT's special land use methodology, 323 persons would be required to play the 13<sup>th</sup> hole during an average day of play in order meet the cost reasonableness criteria. A conservative estimate of the anticipated usage of this area of the golf course during the shortest day of the winter (approximately 10 hours) is 160 persons and the anticipated usage of this area of the golf course during the longest day of the summer (approximately 15 hours) is 240 persons. Based on the average usage that would be required to use this site per day, noise barriers at this site were determined to not be reasonable and are not recommended for further consideration or public input. The analyzed noise barrier location is shown in **Figure 4-1**.

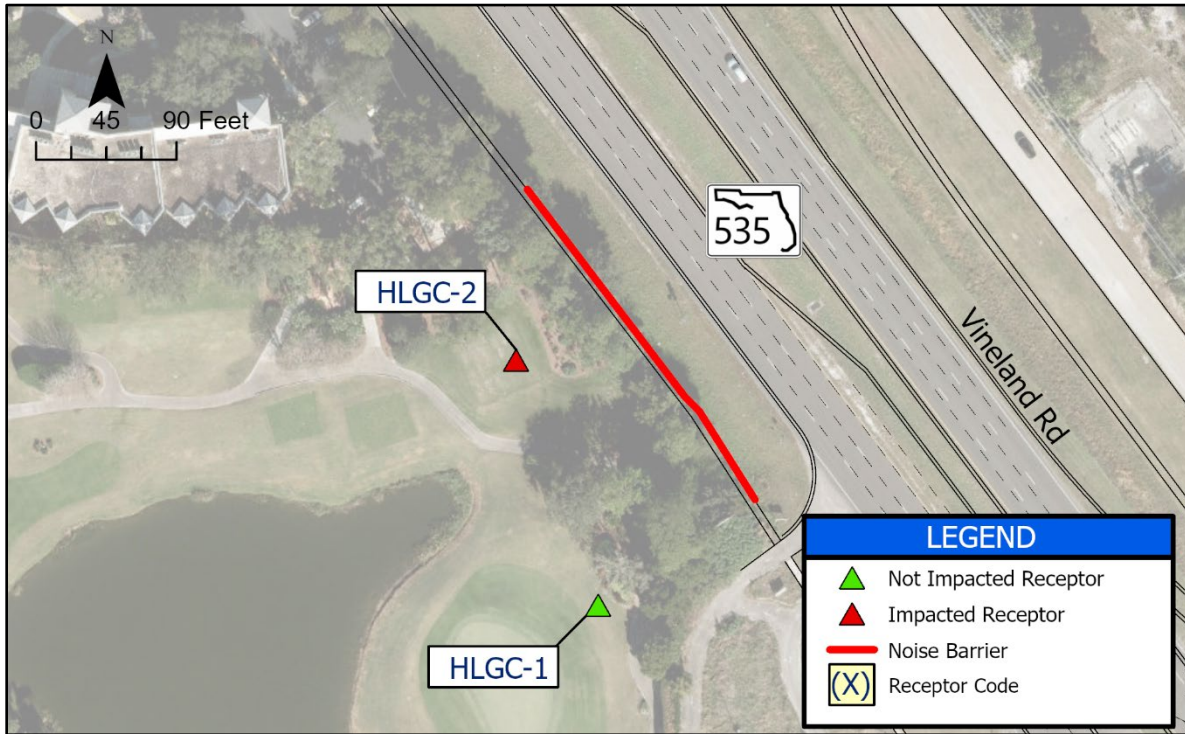


Figure 4-1: Analyzed Noise Barrier Location

## 5 Conclusions and Recommendations

Traffic noise levels were predicted along the project corridor for the Existing Conditions, No Build, and the Preferred Alternative. Throughout the project corridor, 32 single-family homes (Category B/Residential Areas), four (4) hotels along with five (5) restaurants with exterior use (Category E/Outdoor Use Areas) and one (1) non-residential/special land use site consisting of the Hawk's Landing Golf Club (Category C/Recreational Area) were designated as noise sensitive areas. Under the Preferred Alternative, traffic noise levels for the entire project are predicted to range from 56.0 dB(A) to 69.2 dB(A). The highest traffic noise level increase between the Existing Condition and the Preferred Alternative is 2.7 dB(A). Therefore, traffic noise levels throughout the project corridor are not expected to substantially increase above the existing conditions.

Under the Preferred Alternative, traffic noise levels with the planned improvements are predicted to approach or exceed the relevant NAC at one (1) special land use site, the Hawk's Landing Golf Club. The FDOT's special land use methodology was used to determine if the cost of a noise barrier would be reasonable for the impacted recreational areas based on the level of activity expected at the Hawk's Landing Golf Club. Based on the average usage that would be required to use this site per day, noise barriers at this site were determined to not be reasonable and are not recommended for further consideration or public input.

Based on the noise analyses performed to date, there are no feasible solutions available to mitigate the noise impacts at the locations identified in **Section 4**.

## 6 Public Involvement

### 6.1 Land Use Compatibility

To aid in promoting land use compatibility, a copy of the NSR, which provides information that can be used to protect future land development from becoming incompatible with anticipated traffic noise levels, is available to local agencies. In addition, generalized future noise impact contours for the properties in the immediate vicinity of the project have been developed for Noise Abatement Activity Categories B/C and E (i.e., residential/other sensitive land uses and sensitive commercial, respectively). These contours represent the approximate distance from the edge of the nearest proposed travel lane of SR 535 to the limits of the area predicted to approach [i.e., within 1 dB(A)] or exceed the NAC during the design year. These contours do not consider any shielding of noise provided by structures or elevation changes between the receiver and the proposed travel lanes. Within the project corridor, the distances between the proposed edge of the outside travel lane and the contour at various locations are presented in **Table 6-1**.

As previously mentioned, at the time of submittal for this NSR, progress has been monitored for the site being planned for development on the southeast corner of SR 535 and World Center Drive. No official construction permits have been approved for construction, but if that were to change before the NSR is finalized the development will be analyzed further.

**Table 6-1: Preferred Alternative Noise Impact Contour Distances**

SR 535		Approximate Distance from proposed nearest to SR 535 Lane to Noise Contour Line (feet)	
From	To	71 dB(A) Activity Category E	66 dB(A) Activity Category B/C
US 192	Lake Bryan Beach Blvd	50	100

### 6.2 Public Outreach

Public involvement activities were integrated into the PD&E study process providing the opportunity for property owners, residents, businesses, government entities and agencies

to share their concerns and ideas with the Department. The following is a brief summary of these activities.

- A Public Involvement Plan (PIP) has been developed and is being carried out as an integral part of the project and provides an overview of the outreach approach for the PD&E Study.
- As part of the Programming Screen for this project, an Advance Notification Package was sent to the Florida State Clearinghouse on May 9, 2019, where it was then distributed to the appropriate state agencies, non-state agencies and tribal nations for review.
- An Informational Kick-Off Newsletter was sent in November 2020 in lieu of a Kick-Off Meeting. The newsletter was sent to adjacent property owners within 300 feet of the study corridor, elected officials, agencies, and interested parties.
- A Hybrid Alternatives Public Information Meeting (APIM) was held on August 11, 2022 at Embassy Suites – Lake Buena Vista South and online via GoToWebinar. This meeting provided an opportunity for property owners, residents, businesses, elected officials, stakeholders and other interested parties to view project alternatives before developing a recommended set of improvements and ask questions of the study team and provide comments. No comments were received during this meeting regarding highway noise.
- A Public Hearing was held on June 18, 2024 (virtual via GoToWebinar) and on June 20, 2024 (in-person) at Embassy Suites – Lake Buena Vista South. The hearing was held to give interested persons an opportunity to express their views concerning the location, conceptual design, and social, economic, and environmental effects of the proposed improvements. No comments were received during this meeting regarding highway noise.



In addition, a Project Visioning Team was formed during the Corridor Planning Study (CPS). This group was expanded for the PD&E Study and a Community Advisory Group (CAG) was formed. The CAG includes participation from the following groups: Orange County, Osceola County, MetroPlan Orlando, LYNX, East Central Florida Regional Council, FDOT District 5, International Drive Resort Area Chamber of Commerce, Kissimmee-Osceola County Chamber of Commerce. There have been several meetings with the CAG group and the Local Agencies throughout the study. No formal comments have been made concerning the Noise Study Report.

## 7 Construction Noise and Vibration

Based on the existing land use within the limits of this project, construction of the proposed roadway improvements is not anticipated to 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*<sup>8</sup> 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 FDOT's Noise Specialist and the Contractor, will investigate additional methods of controlling these impacts.

## 8 References

1. 23 CFR Part 772, "*Procedures for Abatement of Highway Traffic Noise and Construction Noise*", Federal Register, Vol. 75, No. 133, Tuesday, July 13, 2010.
2. Florida Department of Transportation, "*Project Development and Environment Manual, Part 2, Chapter 18, Noise*", July 1, 2023.
3. Federal Highway Administration Report FHWA-HEP-10-025, "*Highway Traffic Noise: Analysis and Abatement Guidance*", June 2010 (revised December, 2010).
4. *Traffic Noise Modeling and Analysis Practitioner's Handbook; FDOT Environmental Management Office; December 2018*
5. Florida Department of Transportation, "*Quality/ Level of Service Handbook; Systems Planning Office; June 2023*."
6. Florida Department of Transportation, "*Design Manual, Part 2, Chapter 264, Noise Walls and Perimeter Walls*", January 1, 2019.
7. Florida Department of Transportation, "*A Method To Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations*," July 22. 2009.
8. Florida Department of Transportation, "*Standard Specifications for Road and Bridge Construction*." FY 2024 – 2025.



# APPENDIX A

## Traffic Data



## 72 – Hour Classification Counts

## ANNUAL VEHICLE CLASSIFICATION REPORT

VHB PROJECT NO: 63311.02 - 2019 Orange County Counts  
 LOCATION CODE: 1  
 COUNT LOCATION: SR 535 Btwn EB Ramp to Osceola Pkwy US 192  
 EQUIPMENT ID: 70

Vehicle Classification	Vehicle Type	Average Daily Statistics	
		Volume	Percentage
Class 1	Motorcycles	279	0.88%
Class 2	Cars	23,472	74.32%
Class 3	Pick-Ups & Vans	4,661	14.76%
Class 4	Buses	156	0.49%
Class 5	2 Axle, Single Unit Trucks	1,344	4.26%
Class 6	3 Axle, Single Unit Trucks	135	0.43%
Class 7	4 Axle, Single Unit Trucks	66	0.21%
Class 8	2 Axle Trctr with 1 or 2 Axle Trlr, 3 Axle Trctr with 1 Axle	672	2.13%
Class 9	3 Axle Tractor with 2 Axle Trailer	89	0.28%
Class 10	3 Axle Tractor with 3 Axle Trailer	105	0.33%
Class 11	5 Axle Multi Trailer	29	0.09%
Class 12	6 Axle Multi Trailer	14	0.04%
Class 13	7 or more Axles	17	0.05%
Class 14	Not Used	543	1.72%
Class 15	Other	0	0.00%
<b>TOTALS</b>		<b>31,582</b>	<b>100.00%</b>

Vehicle Type	Volume	Percentage
Auto	23,472	75.62%
Medium	6,677	21.51%
Heavy	455	1.47%
Bus	156	0.50%
Motorcycle	279	0.90%
Total	31,039	100.00%



## ANNUAL VEHICLE CLASSIFICATION REPORT

VHB PROJECT NO: 63311.02 - 2019 Orange County Counts  
 LOCATION CODE: 2  
 COUNT LOCATION: SR 535 between Poinciana Blvd and Polynesian Isle Blvd  
 EQUIPMENT ID: 70

Vehicle Classification	Vehicle Type	Average Daily Statistics	
		Volume	Percentage
Class 1	Motorcycles	524	1.24%
Class 2	Cars	27,728	65.67%
Class 3	Pick-Ups & Vans	7,717	18.28%
Class 4	Buses	273	0.65%
Class 5	2 Axle, Single Unit Trucks	1,334	3.16%
Class 6	3 Axle, Single Unit Trucks	293	0.69%
Class 7	4 Axle, Single Unit Trucks	150	0.36%
Class 8	2 Axle Trctr with 1 or 2 Axle Trlr, 3 Axle Trctr with 1 Axle	1,476	3.50%
Class 9	3 Axle Tractor with 2 Axle Trailer	234	0.55%
Class 10	3 Axle Tractor with 3 Axle Trailer	264	0.63%
Class 11	5 Axle Multi Trailer	124	0.29%
Class 12	6 Axle Multi Trailer	70	0.17%
Class 13	7 or more Axles	93	0.22%
Class 14	Not Used	1,946	4.61%
Class 15	Other	0	0.00%
<b>TOTALS</b>		<b>42,226</b>	<b>100.00%</b>

Vehicle Type	Volume	Percentage
Auto	27,728	68.84%
Medium	10,527	26.13%
Heavy	1,228	3.05%
Bus	273	0.68%
Motorcycle	524	1.30%
Total	40,280	100.00%

## ANNUAL VEHICLE CLASSIFICATION REPORT

VHB PROJECT NO: 63311.02 - 2019 Orange County Counts  
 LOCATION CODE: 3  
 COUNT LOCATION: SR 535 between LBV Factory Stores Dr International Dr  
 EQUIPMENT ID: 0

Vehicle Classification	Vehicle Type	Average Daily Statistics	
		Volume	Percentage
Class 1	Motorcycles	1,110	2.22%
Class 2	Cars	34,512	68.97%
Class 3	Pick-Ups & Vans	8,423	16.83%
Class 4	Buses	417	0.83%
Class 5	2 Axle, Single Unit Trucks	1,091	2.18%
Class 6	3 Axle, Single Unit Trucks	370	0.74%
Class 7	4 Axle, Single Unit Trucks	238	0.48%
Class 8	2 Axle Trctr with 1 or 2 Axle Trlr, 3 Axle Trctr with 1 Axle	1,180	2.36%
Class 9	3 Axle Tractor with 2 Axle Trailer	243	0.49%
Class 10	3 Axle Tractor with 3 Axle Trailer	374	0.75%
Class 11	5 Axle Multi Trailer	122	0.24%
Class 12	6 Axle Multi Trailer	55	0.11%
Class 13	7 or more Axles	101	0.20%
Class 14	Not Used	1,801	3.60%
Class 15	Other	0	0.00%
<b>TOTALS</b>		<b>50,037</b>	<b>100.00%</b>

Vehicle Type	Volume	Percentage
Auto	34,512	71.55%
Medium	10,694	22.17%
Heavy	1,503	3.12%
Bus	417	0.86%
Motorcycle	1,110	2.30%
Total	48,236	100.00%

## ANNUAL VEHICLE CLASSIFICATION REPORT

VHB PROJECT NO: 63311.02 - 2019 Orange County Counts  
 LOCATION CODE: 4  
 COUNT LOCATION: SR 535 between International Dr and SR 536  
 EQUIPMENT ID: 0

Vehicle Classification	Vehicle Type	Average Daily Statistics	
		Volume	Percentage
Class 1	Motorcycles	235	0.51%
Class 2	Cars	33,261	71.60%
Class 3	Pick-Ups & Vans	5,949	12.81%
Class 4	Buses	565	1.22%
Class 5	2 Axle, Single Unit Trucks	1,332	2.87%
Class 6	3 Axle, Single Unit Trucks	194	0.42%
Class 7	4 Axle, Single Unit Trucks	31	0.07%
Class 8	2 Axle Trctr with 1 or 2 Axle Trlr, 3 Axle Trctr with 1 Axle	1,103	2.37%
Class 9	3 Axle Tractor with 2 Axle Trailer	121	0.26%
Class 10	3 Axle Tractor with 3 Axle Trailer	213	0.46%
Class 11	5 Axle Multi Trailer	231	0.50%
Class 12	6 Axle Multi Trailer	47	0.10%
Class 13	7 or more Axles	71	0.15%
Class 14	Not Used	3,104	6.68%
Class 15	Other	0	0.00%
<b>TOTALS</b>		<b>46,457</b>	<b>100.00%</b>

Vehicle Type	Volume	Percentage
Auto	33,261	76.72%
Medium	8,384	19.34%
Heavy	908	2.09%
Bus	565	1.30%
Motorcycle	235	0.54%
Total	43,353	100.00%

## ANNUAL VEHICLE CLASSIFICATION REPORT

VHB PROJECT NO: 63311.02 - 2019 Orange County Counts  
 LOCATION CODE: 5  
 COUNT LOCATION: SR 535 between SR 536 and Lake Bryan Beach  
 EQUIPMENT ID: 0

Vehicle Classification	Vehicle Type	Average Daily Statistics	
		Volume	Percentage
Class 1	Motorcycles	192	0.44%
Class 2	Cars	28,448	65.93%
Class 3	Pick-Ups & Vans	7,428	17.22%
Class 4	Buses	863	2.00%
Class 5	2 Axle, Single Unit Trucks	1,826	4.23%
Class 6	3 Axle, Single Unit Trucks	144	0.33%
Class 7	4 Axle, Single Unit Trucks	27	0.06%
Class 8	2 Axle Trctr with 1 or 2 Axle Trlr, 3 Axle Trctr with 1 Axle	1,431	3.32%
Class 9	3 Axle Tractor with 2 Axle Trailer	76	0.18%
Class 10	3 Axle Tractor with 3 Axle Trailer	227	0.53%
Class 11	5 Axle Multi Trailer	315	0.73%
Class 12	6 Axle Multi Trailer	17	0.04%
Class 13	7 or more Axles	89	0.21%
Class 14	Not Used	2,064	4.78%
Class 15	Other	0	0.00%
<b>TOTALS</b>		<b>43,147</b>	<b>100.00%</b>

Vehicle Type	Volume	Percentage
Auto	28,448	69.25%
Medium	10,685	26.01%
Heavy	895	2.18%
Bus	863	2.10%
Motorcycle	192	0.47%
Total	41,083	100.00%



## Excerpt from QLOS Handbook

# C3C & C3R

## Motor Vehicle Arterial Generalized Service Volume Tables

### Peak Hour Directional

### Peak Hour Two-Way

### AADT



(C3C-Suburban Commercial)

	B	C	D	E
1 Lane	*	760	1,070	**
2 Lane	*	1,520	1,810	**
3 Lane	*	2,360	2,680	**
4 Lane	*	3,170	3,180	**

	B	C	D	E
2 Lane	*	1,380	1,950	**
4 Lane	*	2,760	3,290	**
6 Lane	*	4,290	4,870	**
8 Lane	*	5,760	5,780	**

	B	C	D	E
2 Lane	*	15,300	21,700	**
4 Lane	*	30,700	36,600	**
6 Lane	*	47,700	54,100	**
8 Lane	*	64,000	64,200	**



(C3R-Suburban Residential)

	B	C	D	E
1 Lane	*	970	1,110	**
2 Lane	*	1,700	1,850	**
3 Lane	*	2,620	2,730	**

	B	C	D	E
2 Lane	*	1,760	2,020	**
4 Lane	*	3,090	3,360	**
6 Lane	*	4,760	4,960	**

	B	C	D	E
2 Lane	*	19,600	22,400	**
4 Lane	*	34,300	37,300	**
6 Lane	*	52,900	55,100	**

### Adjustment Factors

The peak hour directional service volumes should be adjusted by multiplying by 1.2 for one-way facilities  
 The AADT service volumes should be adjusted by multiplying 0.6 for one way facilities  
 2 Lane Divided Roadway with an Exclusive Left Turn Lane(s): Multiply by 1.05  
 2 lane Undivided Roadway with No Exclusive Left Turn Lane(s): Multiply by 0.80

Exclusive right turn lane(s): Multiply by 1.05  
 Multilane Undivided Roadway with an Exclusive Left Turn Lane(s): Multiply by 0.95  
 Multilane Roadway with No Exclusive Left Turn Lane(s): Multiply by 0.75  
 Non-State Signalized Roadway: Multiply by 0.90

This table does not constitute a standard and should be used only for general planning applications. The table should not be used for corridor or intersection design, where more refined techniques exist.

\* Cannot be achieved using table input value defaults.

\*\* Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached.





## TNM Traffic Data Sources

Existing

Intersection	Segments	Existing										Vehicle Traffic Factors				
		# Lanes Existing	NB-EB Existing TMV (AM)	SB-WB Existing TMV (AM)	NB-EB Existing TMV (PM)	SB-WB Existing TMV (PM)	Existing Peak Hour TMV (NB-EB)	Existing Peak Hour TMV (SB-WB)	QLOS LOS C Volume	TNM Traffic Data Source (NB-EB)	TNM Traffic Data Source (SB-WB)	Auto	Medium	Heavy	Bus	Motorcycle
SR 535@Lake Bryan Beach Blvd	Lake Bryan Beach Blvd, west of SR 535 (Local)	1	0	29	0	51	0	51	760	TMV	TMV	69.2%	26.0%	2.2%	2.1%	0.5%
	Lake Bryan Beach Blvd, East of SR 535 (Local)	1	110	64	54	160	110	160	760	TMV	TMV	69.2%	26.0%	2.2%	2.1%	0.5%
	SR 535, North of Lake Bryan Beach Blvd(Regional)	3	1,932	1,258	1,620	1,796	1932	1796	2360	TMV	TMV	69.2%	26.0%	2.2%	2.1%	0.5%
	SR 535, South of Lake Bryan Beach Blvd(Regional)	3	1,971	1,222	1,602	1,833	1971	1833	2360	TMV	TMV	69.2%	26.0%	2.2%	2.1%	0.5%
SR 535@World Center Dr	World Center Dr, west of SR 535(Regional)	2	620	1,614	1,463	1,406	1463	1614	1520	TMV	QLOS Handbook	76.7%	19.3%	2.1%	1.3%	0.5%
	World Center Dr, East of SR 535(Regional)	2	1,015	1,547	2,148	1,896	2148	1896	1520	QLOS Handbook	QLOS Handbook	76.7%	19.3%	2.1%	1.3%	0.5%
	SR 535, North of World Center Dr(Regional)	3	1,971	1,222	1,602	1,833	1971	1833	2360	TMV	TMV	76.7%	19.3%	2.1%	1.3%	0.5%
	SR 535, South of World Center Dr(Regional)	3	2,379	1,168	2,156	2,192	2379	2192	2360	QLOS Handbook	TMV	76.7%	19.3%	2.1%	1.3%	0.5%
SR 535@International Dr S	International Dr S, West of SR 535(Regional)	3	620	124	1,463	154	1463	154	2360	TMV	TMV	71.5%	22.2%	3.1%	0.9%	2.3%
	International Dr S, East of SR 535(Regional)	3	-	-	-	-	0	0	2360	TMV	TMV	71.5%	22.2%	3.1%	0.9%	2.3%
	SR 535, North of International Dr S(Regional)	3	2,379	1,168	2,156	2,192	2379	2192	2360	QLOS Handbook	TMV	76.7%	19.3%	2.1%	1.3%	0.5%
	SR 535, South of International Dr S(Regional)	2	2,347	1,168	1,714	2,448	2347	2448	1520	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%
SR 535@LBV Factory Stores Dr	LBV Factory Stores Dr, west of SR 535 (Local)	1	25	63	32	117	32	117	760	TMV	TMV	71.5%	22.2%	3.1%	0.9%	2.3%
	LBV Factory Stores Dr, East of SR 535 (Local)	2	71	71	112	112	112	112	1520	TMV	TMV	71.5%	22.2%	3.1%	0.9%	2.3%
	SR 535, North of LBV Factory Stores Dr(Regional)	2	2,347	1,168	1,714	2,448	2347	2448	1520	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%
	SR 535, South LBV Factory Stores Dr(Regional)	2	2,309	1,090	1,610	2,367	2309	2367	1520	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%
SR 535@Polynesian Isle Blvd	Polynesian Isle Blvd, west of SR 535 (Local)	2	395	153	410	527	410	527	1520	TMV	TMV	68.8%	26.1%	3.0%	0.7%	1.3%
	Polynesian Isle Blvd, East of SR 535 (Local)	2	30	200	158	244	158	244	1520	TMV	TMV	68.8%	26.1%	3.0%	0.7%	1.3%
	SR 535, North of Polynesian Isle Blvd(Regional)	2	2,333	1,104	1,648	2,347	2333	2347	1520	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%
	SR 535, South of Polynesian Isle Blvd(Regional)	2	1,837	1,020	1,288	1,956	1837	1956	1520	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%
SR 535@Poinciana Blvd	Poinciana Blvd, west of SR 535(Regional)	2	788	450	632	825	788	825	1520	TMV	TMV	68.8%	26.1%	3.0%	0.7%	1.3%
	Poinciana Blvd, East of SR 535(Local)	2	76	236	129	490	129	490	1520	TMV	TMV	68.8%	26.1%	3.0%	0.7%	1.3%
	SR 535, North of Poinciana Blvd(Regional)	2	1,821	998	1,287	1,922	1821	1922	1520	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%
	SR 535, South of Poinciana Blvd(Regional)	2	1,084	759	784	1,587	1084	1587	1520	TMV	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%
SR 535@Osceola Pkwy On-Ramps	Catypso Cay Way, west of SR 535(Local)	1	118	76	123	55	123	76	760	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	Osceola Pkwy On ramp (WB), East of SR 535	1	196	-	459	-	459	0	760	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, North of Osceola Pkwy On ramp(Regional)	3	1,134	606	865	1,214	1134	1214	2360	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, South of Osceola Pkwy On ramp(Regional)	2	1,183	621	888	1,250	1183	1250	1520	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
SR 535@Kyns Heath Rd	Kyns Heath Rd, west of SR 535(Local)	1	137	79	284	140	284	140	760	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	Kyns Heath Rd, East of SR 535(Local)	1	78	79	149	111	149	111	760	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, North of Kyns Heath Rd(Regional)	2	1,183	613	888	1,250	1183	1250	1520	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, South of Kyns Heath Rd(Regional)	2	1,138	548	806	1,134	1138	1134	1520	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
SR 535@US 192	US 192, west of SR 535(Regional)	3	880	1,350	1,410	1,313	1410	1350	2360	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	US 192, East of SR 535(Regional)	3	1,253	2,308	2,227	1,798	2227	2308	2360	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, North of US 192(Regional)	2	1,090	502	798	1,130	1090	1130	1520	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, South of US 192(Local)	1	9	6	7	7	9	7	760	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%

## No Build

Intersection	Segments	No Build				Vehicle Traffic Factors				
		# Lanes Existing	QLOS LOS C Volume	TNM Traffic Data Source (NB-EB)	TNM Traffic Data Source (SB-WB)	Auto	Medium	Heavy	Bus	Motorcycle
SR 535@Lake Bryan Beach Blvd	Lake Bryan Beach Blvd, west of SR 535 (Local)	1	760	QLOS Handbook	QLOS Handbook	69.2%	26.0%	2.2%	2.1%	0.5%
	Lake Bryan Beach Blvd, East of SR 535 (Local)	1	760	QLOS Handbook	QLOS Handbook	69.2%	26.0%	2.2%	2.1%	0.5%
	SR 535, North of Lake Bryan Beach Blvd(Regional)	3	2360	QLOS Handbook	QLOS Handbook	69.2%	26.0%	2.2%	2.1%	0.5%
	SR 535, South of Lake Bryan Beach Blvd(Regional)	3	2360	QLOS Handbook	QLOS Handbook	69.2%	26.0%	2.2%	2.1%	0.5%
SR 535@World Center Dr	World Center Dr, west of SR 535(Regional)	2	1520	QLOS Handbook	QLOS Handbook	76.7%	19.3%	2.1%	1.3%	0.5%
	World Center Dr, East of SR 535(Regional)	2	1520	QLOS Handbook	QLOS Handbook	76.7%	19.3%	2.1%	1.3%	0.5%
	SR 535, North of World Center Dr(Regional)	3	2360	QLOS Handbook	QLOS Handbook	76.7%	19.3%	2.1%	1.3%	0.5%
	SR 535, South of World Center Dr(Regional)	3	2360	QLOS Handbook	QLOS Handbook	76.7%	19.3%	2.1%	1.3%	0.5%
SR 535@International Dr S	International Dr S, West of SR 535(Regional)	3	2360	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%
	International Dr S, East of SR 535(Regional)	3	2360	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%
	SR 535, North of International Dr S(Regional)	3	2360	QLOS Handbook	QLOS Handbook	76.7%	19.3%	2.1%	1.3%	0.5%
	SR 535, South of International Dr S(Regional)	2	1520	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%
SR 535@LBV Factory Stores Dr	LBV Factory Stores Dr, west of SR 535 (Local)	1	760	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%
	LBV Factory Stores Dr, East of SR 535 (Local)	2	1520	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%
	SR 535, North of LBV Factory Stores Dr(Regional)	2	1520	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%
	SR 535, South LBV Factory Stores Dr(Regional)	2	1520	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%
SR 535@Polynesian Isle Blvd	Polynesian Isle Blvd, west of SR 535 (Local)	2	1520	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%
	Polynesian Isle Blvd, East of SR 535 (Local)	2	1520	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%
	SR 535, North of Polynesian Isle Blvd(Regional)	2	1520	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%
	SR 535, South of Polynesian Isle Blvd(Regional)	2	1520	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%
SR 535@Poinciana Blvd	Poinciana Blvd, west of SR 535(Regional)	2	1520	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%
	Poinciana Blvd, East of SR 535(Local)	2	1520	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%
	SR 535, North of Poinciana Blvd(Regional)	3	2360	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%
	SR 535, South of Poinciana Blvd(Regional)	2	1520	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%
SR 535@Osceola Pkwy On-Ramps	Calypso Cay Way, west of SR 535(Local)	1	760	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%
	Osceola Pkwy On ramp (WB), East of SR 535	1	760	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, North of Osceola Pkwy On ramp(Regional)	2	1520	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, South of Osceola Pkwy On ramp(Regional)	2	1520	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%
SR 535@Kyngs Heath Rd	Kyngs Heath Rd, west of SR 535(Local)	1	760	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%
	Kyngs Heath Rd, East of SR 535(Local)	1	760	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, North of Kyngs Heath Rd(Regional)	2	1520	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, South of Kyngs Heath Rd(Regional)	2	1520	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%
SR 535@US 192	US 192, west of SR 535(Regional)	3	2360	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%
	US 192, East of SR 535(Regional)	3	2360	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, North of US 192(Regional)	2	1520	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, South of US 192(Local)	1	760	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%

**Build**

Intersection	Segments	Build										Vehicle Traffic Factors					
		# Lanes Build	NB-EB 2045 TMV (AM)	SB-WB 2045 TMV (AM)	NB-EB 2045 TMV (PM)	SB-WB 2045 TMV (PM)	2045 Peak Hour TMV (NB-EB)	2045 Peak Hour TMV (SB-WB)	QLOS LOS C Volume (2025)	TNM Traffic Data Source (NB-EB)	TNM Traffic Data Source (SB-WB)	Auto	Medium	Heavy	Bus	Motorcycle	
SR 535@Lake Bryan Beach Blvd	Lake Bryan Beach Blvd, west of SR 535 (Local)	1	23	39	20	62	23	62	760		TMV	TMV	69.2%	26.0%	2.2%	2.1%	0.5%
	Lake Bryan Beach Blvd, East of SR 535 (Local)	1	129	76	73	173	129	173	760		TMV	TMV	69.2%	26.0%	2.2%	2.1%	0.5%
	SR 535, North of Lake Bryan Beach Blvd(Regional)	3	2,478	2,268	2,366	2,412	2478	2412	2360	QLOS Handbook	QLOS Handbook	69.2%	26.0%	2.2%	2.1%	0.5%	
	SR 535, South of Lake Bryan Beach Blvd(Regional)	3	2,515	2,236	2,347	2,451	2515	2451	2360	QLOS Handbook	QLOS Handbook	69.2%	26.0%	2.2%	2.1%	0.5%	
SR 535@World Center Dr	World Center Dr, west of SR 535(Regional)	2	2,271	2,537	2,372	2,136	2372	2537	1520	QLOS Handbook	QLOS Handbook	76.7%	19.3%	2.1%	1.3%	0.5%	
	World Center Dr, East of SR 535(Regional)	2	1,893	2,459	2,235	2,304	2235	2459	1520	QLOS Handbook	QLOS Handbook	76.7%	19.3%	2.1%	1.3%	0.5%	
	SR 535, North of World Center Dr(Regional)	3	2,515	2,236	2,347	2,451	2515	2451	2360	QLOS Handbook	QLOS Handbook	76.7%	19.3%	2.1%	1.3%	0.5%	
	SR 535, South of World Center Dr(Regional)	3	2,325	2,346	2,232	2,641	2325	2641	2360	TMV	QLOS Handbook	76.7%	19.3%	2.1%	1.3%	0.5%	
SR 535@International Dr S	International Dr S, West of SR 535(Regional)	3	2,271	1,391	2,372	1,226	2372	1391	2360	QLOS Handbook	TMV	TMV	71.5%	22.2%	3.1%	0.9%	2.3%
	International Dr S, East of SR 535(Regional)	3	1,883	1,578	1,722	1,350	1883	1578	2360	TMV	TMV	71.5%	22.2%	3.1%	0.9%	2.3%	
	SR 535, North of International Dr S(Regional)	3	2,325	2,346	2,232	2,641	2325	2641	2360	TMV	QLOS Handbook	76.7%	19.3%	2.1%	1.3%	0.5%	
	SR 535, South of International Dr S(Regional)	3	2,938	2,620	2,505	2,922	2938	2922	2360	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%	
SR 535@LBV Factory Stores Dr	LBV Factory Stores Dr, west of SR 535 (Local)	1	46	111	62	194	62	194	760		TMV	TMV	71.5%	22.2%	3.1%	0.9%	2.3%
	LBV Factory Stores Dr, East of SR 535 (Local)	2	404	404	378	378	404	404	1520		TMV	TMV	71.5%	22.2%	3.1%	0.9%	2.3%
	SR 535, North of LBV Factory Stores Dr(Regional)	3	2,938	2,620	2,505	2,922	2938	2922	2360	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%	
	SR 535, South LBV Factory Stores Dr(Regional)	3	2,920	2,776	2,516	2,994	2920	2994	2360	QLOS Handbook	QLOS Handbook	71.5%	22.2%	3.1%	0.9%	2.3%	
SR 535@Polynesian Isle Blvd	Polynesian Isle Blvd, west of SR 535 (Local)	2	688	565	664	721	688	721	1520		TMV	TMV	68.8%	26.1%	3.0%	0.7%	1.3%
	Polynesian Isle Blvd, East of SR 535 (Local)	2	416	476	522	456	522	476	1520		TMV	TMV	68.8%	26.1%	3.0%	0.7%	1.3%
	SR 535, North of Polynesian Isle Blvd(Regional)	3	2,961	2,704	2,516	2,928	2961	2928	2360	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%	
	SR 535, South of Polynesian Isle Blvd(Regional)	3	2,682	2,608	2,456	2,745	2682	2745	2360	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%	
SR 535@Poinciana Blvd	Poinciana Blvd, west of SR 535(Regional)	2	919	699	984	858	984	858	1520		TMV	TMV	68.8%	26.1%	3.0%	0.7%	1.3%
	Poinciana Blvd, East of SR 535(Local)	2	508	881	494	955	508	955	1520		TMV	TMV	68.8%	26.1%	3.0%	0.7%	1.3%
	SR 535, North of Poinciana Blvd(Regional)	3	2,682	2,520	2,498	2,637	2682	2637	2360	QLOS Handbook	QLOS Handbook	68.8%	26.1%	3.0%	0.7%	1.3%	
	SR 535, South of Poinciana Blvd(Regional)	3	1,732	2,163	1,405	2,131	1732	2163	2360	TMV	TMV	68.8%	26.1%	3.0%	0.7%	1.3%	
SR 535@Osceola Pkwy On-Ramps	Calypso Cay Way, west of SR 535(Local)	1	161	105	152	68	161	105	760		TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	Osceola Pkwy On ramp (WB), East of SR 535	1	746	-	633	-	746	0	760		TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, North of Osceola Pkwy On ramp(Regional)	3	1,863	1,548	1,538	1,631	1863	1631	2360	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%	
	SR 535, South of Osceola Pkwy On ramp(Regional)	3	1,918	1,554	1,567	1,676	1918	1676	2360	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%	
SR 535@Kyngs Heath Rd	Kyngs Heath Rd, west of SR 535(Local)	1	346	173	370	182	370	182	760		TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	Kyngs Heath Rd, East of SR 535(Local)	1	356	465	373	353	373	465	760		TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	SR 535, North of Kyngs Heath Rd(Regional)	3	1,918	1,554	1,567	1,676	1918	1676	2360	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%	
	SR 535, South of Kyngs Heath Rd(Regional)	3	1,664	1,409	1,434	1,529	1664	1529	2360	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%	
SR 535@US 192	US 192, west of SR 535(Regional)	3	1,610	1,700	1,836	1,501	1836	1700	2360		TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%
	US 192, East of SR 535(Regional)	3	2,276	2,618	2,610	2,177	2610	2618	2360	QLOS Handbook	QLOS Handbook	75.6%	21.5%	1.5%	0.5%	0.9%	
	SR 535, North of US 192(Regional)	3	1,664	1,409	1,434	1,529	1664	1529	2360	TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%	
	SR 535, South of US 192(Local)	1	26	23	17	14	26	23	760		TMV	TMV	75.6%	21.5%	1.5%	0.5%	0.9%





# **APPENDIX B**

## **Field Monitoring Sheets**

Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE

**Project:** SR 535

**Site ID:** FR1 Run 1

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 90.8 End: 95.1 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 1.1 Max: 8.9 Average: 3.8 (mph)

Wind Speed (End): Min: 2.3 Max: 5.5 Average: 4.1 (mph)

Humidity Start: 58.1 End: 62.2 (%)

#### Equipment Data

Sound Level Meter: CEL-246 Serial Number 50' Run 1 1443727 100' Run 1 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 58.4/57.7  
in dB(A)

Major Noise Sources:

Background Noise Sources:

Other Notes/Observations:

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Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 12:33 PM

**Project:** SR 535

**Site ID:** FR 1 Run 2

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 90.5 End: 90.6 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 0.4 Max: 4.3 Average: 3.3 (mph)

Wind Speed (End): Min: 1.3 Max: 7.2 Average: 2.3 (mph)

Humidity Start: 57.6 End: 57.2 (%)

#### Equipment Data

Sound Level Meter: CEL-246 Serial Number 50' Run 2 1443727 100' Run 2 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 61.2/58.2  
in dB(A)

Major Noise Sources: SR 535 and US 192 traffic

Background Noise Sources: Helicopter distant 9:20 and 7:10

Other Notes/Observations:

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Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 12:44 PM

**Project:** SR 535

**Site ID:** FR1 Run 3

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 96.5 End: 93.4 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 1.8 Max: 6.9 Average: 2.2 (mph)

Wind Speed (End): Min: 0.6 Max: 6.8 Average: 2.7 (mph)

Humidity Start: 54.8 End: 51.6 (%)

#### Equipment Data

Sound Level Meter: CEL-246 Serial Number 50' Run 3 1443727 100' Run 3 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 59.4/59  
in dB(A)

Major Noise Sources: SR 535 and US 192

Background Noise Sources: Helicopter 5:04

Other Notes/Observations:

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Observed Traffic Data

Observed Traffic Data

Site #: FR1

Run #: 1-3

Vehicle Types	FR1-1		FR1-2		FR1-3	
	Volume	Speed	Volume	Speed	Volume	Speed
Auto	NB: 124 SB: 120	NB: 30 SB: 20	NB: 106 SB: 101	NB: 27 SB: 16	NB: 116 SB: 113	NB: 29 SB: 16
Medium Truck	NB: 2 SB: 1	NB: 27 SB: 20	NB: 0 SB: 1	NB: 0 SB: 25	NB: 1 SB: 2	NB: 29 SB: 16
Heavy Truck	NB: 3 SB: 0	NB: 27 SB: 0	NB: 1 SB: 2	NB: 30 SB: 19	NB: 1 SB: 3	NB: 22 SB: 21
Bus	NB: 0 SB: 1	NB: 0 SB: 19	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0
Motorcycle	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0

---

Site Sketch

Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 1:35 PM

**Project:** SR 535

**Site ID:** FR 2 Run 1

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 94.4 End: 95.2 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 1.6 Max: 4.8 Average: 1.2 (mph)

Wind Speed (End): Min: 0.9 Max: 7.7 Average: 2.3 (mph)

Humidity Start: 51.8 End: 48.3 (%)

**Equipment Data**

Sound Level Meter: CEL-246 Serial Number 50' Run 4 1443727 100' Run 4 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 65.2/60.8  
in dB(A)

Major Noise Sources: SR 535 traffic

Background Noise Sources: Helicopter at 4:38 and 1:45

Other Notes/Observations:

50' noise meter height is at about the same height as the NB SR 535 pavement

Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 1:45 PM

**Project:** SR 535

**Site ID:** FR 2 Run 2

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 100.4 End: 99.6 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 0.7 Max: 7.7 Average: 3.4 (mph)

Wind Speed (End): Min: 0.4 Max: 5.4 Average: 3.3 (mph)

Humidity Start: 45.7 End: 49.8 (%)

**Equipment Data**

Sound Level Meter: CEL-246 Serial Number 50' Run 5 100' Run 5  
1443727 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 61.7/60.5  
in dB(A)

Major Noise Sources: \_\_\_\_\_

Background Noise Sources: \_\_\_\_\_

Other Notes/Observations: \_\_\_\_\_

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Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 1:55 PM

**Project:** SR 535

**Site ID:** FR 2 Run 3

**Weather Conditions** Clear Partly Cloudy  Cloudy Other

Temperature Start: 98.4 End: 99.5 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 1.1 Max: 5.8 Average: 2.8 (mph)

Wind Speed (End): Min: 1.6 Max: 6.2 Average: 3.4 (mph)

Humidity Start: 49.8 End: 48.2 (%)

**Equipment Data**

Sound Level Meter: CEL-246 Serial Number 50' 100'  
1443727 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 63.3/59.2  
in dB(A)

Major Noise Sources: SR 535

Background Noise Sources:

Other Notes/Observations:

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Observed Traffic Data

Observed Traffic Data

Site #: FR2

Run #: 1-3

Vehicle Types	FR2-1		FR2-2		FR2-3	
	Volume	Speed	Volume	Speed	Volume	Speed
Auto	NB: 148 SB: 140	NB: 45 SB: 41	NB: 116 SB: 155	NB: 44 SB: 41	NB: 160 SB: 135	NB: 41 SB: 43
Medium Truck	NB: 2 SB: 0	NB: 41 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0	NB: 1 SB: 0	NB: 47 SB: 0
Heavy Truck	NB: 5 SB: 0	NB: 42 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 2	NB: 0 SB: 43
Bus	NB: 2 SB: 0	NB: 40 SB: 0	NB: 0 SB: 1	NB: 0 SB: 37	NB: 0 SB: 0	NB: 0 SB: 0
Motorcycle	NB: 2 SB: 2	NB: 45 SB: 44	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0

---

Site Sketch

Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 2:28 PM

**Project:** SR 535

**Site ID:** FR3 Run 1

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 92.6 End: 97 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 0.1 Max: 3.2 Average: 0.6 (mph)

Wind Speed (End): Min: 0.4 Max: 2.8 Average: 1.4 (mph)

Humidity Start: 56.4 End: 48.3 (%)

**Equipment Data**

Sound Level Meter: CEL-246 Serial Number 50' Run 7 1443727 100' Run 7 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 66.3/64.4  
in dB(A)

**Major Noise Sources:** SR 535

**Background Noise Sources:**

**Other Notes/Observations:**

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Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 2:39 PM

**Project:** SR 535

**Site ID:** FR3 Run 2

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 99.1 End: 98.3 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 0.3 Max: 6.4 Average: 0.9 (mph)

Wind Speed (End): Min: 1.4 Max: 3.9 Average: 3 (mph)

Humidity Start: 47.8 End: 52.8 (%)

**Equipment Data**

Sound Level Meter: CEL-246 Serial Number 50' Run 8 1443727 100' Run 8 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 64.8/60.1  
in dB(A)

Major Noise Sources: \_\_\_\_\_

Background Noise Sources: \_\_\_\_\_

Other Notes/Observations: \_\_\_\_\_

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Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 2:50 PM

**Project:** SR 535

**Site ID:** FR3 Run 3

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 102.8 End: 99.4 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 1.6 Max: 5.5 Average: 3.2 (mph)

Wind Speed (End): Min: 1.4 Max: 7.3 Average: 4.1 (mph)

Humidity Start: 49.1 End: 50.4 (%)

#### Equipment Data

Sound Level Meter: CEL-246 Serial Number 50' Run 9 100' Run 9  
1443727 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 64.7/62.7  
in dB(A)

Major Noise Sources: \_\_\_\_\_

Background Noise Sources: \_\_\_\_\_

Other Notes/Observations: \_\_\_\_\_

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Observed Traffic Data

Observed Traffic Data

Site #: FR3

Run #: 1-3

Vehicle Types	FR3-1		FR3-2		FR3-3	
	Volume	Speed	Volume	Speed	Volume	Speed
Auto	NB: 236 SB: 217	NB: 36 SB: 40	NB: 273 SB: 280	NB: 32 SB: 26	NB: 279 SB: 248	NB: 35 SB: 34
Medium Truck	NB: 4 SB: 0	NB: 18 SB: 0	NB: 4 SB: 1	NB: 34 SB: 39	NB: 0 SB: 1	NB: 0 SB: 34
Heavy Truck	NB: 1 SB: 7	NB: 38 SB: 30	NB: 2 SB: 3	NB: 32 SB: 30	NB: 1 SB: 8	NB: 32 SB: 43
Bus	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0
Motorcycle	NB: 1 SB: 0	NB: 45 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 0

Site Sketch

Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 3:19 PM

**Project:** SR 535

**Site ID:** FR4 Run 1

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 99.4 End: 98.9 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 1 Max: 8.1 Average: 5 (mph)

Wind Speed (End): Min: 0.2 Max: 4.1 Average: 2.7 (mph)

Humidity Start: 47.1 End: 50.8 (%)

#### Equipment Data

Sound Level Meter: CEL-246 Serial Number 50' Run 10 100' Run 10  
1443727 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 65.3/63  
in dB(A)

**Major Noise Sources:** SR 535

**Background Noise Sources:**

**Other Notes/Observations:** Car near 100' at min 3



Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 3:29 PM

**Project:** SR 535

**Site ID:** FR4 Run 2

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 96.5 End: 95.8 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 0.8 Max: 5.6 Average: 3.6 (mph)

Wind Speed (End): Min: 1.2 Max: 7.9 Average: 5.4 (mph)

Humidity Start: 51.4 End: 52.3 (%)

#### Equipment Data

Sound Level Meter: CEL-246 Serial Number 50' Run 11 1443727 100' Run 11 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 64.5/63.9  
in dB(A)

Major Noise Sources: \_\_\_\_\_

Background Noise Sources: \_\_\_\_\_

Other Notes/Observations: \_\_\_\_\_

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Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 3:39 PM

**Project:** SR 535

**Site ID:** FR 4 Run 3

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 96 End: 96.2 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 1.4 Max: 4.2 Average: 2.3 (mph)

Wind Speed (End): Min: 1.1 Max: 7 Average: 3.4 (mph)

Humidity Start: 50.8 End: 55.5 (%)

#### Equipment Data

Sound Level Meter: CEL-246 Serial Number 50' Run 12 1443727 100' Run 12 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 65.8/64  
in dB(A)

Major Noise Sources: \_\_\_\_\_

Background Noise Sources: \_\_\_\_\_

Other Notes/Observations: \_\_\_\_\_

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Observed Traffic Data

Observed Traffic Data

Site #: FR3

Run #: 1-3

Vehicle Types	FR3-1		FR3-2		FR3-3	
	Volume	Speed	Volume	Speed	Volume	Speed
Auto	NB: 258 SB: 258	NB: 44 SB: 39	NB: 249 SB: 284	NB: 43 SB: 35	NB: 264 SB: 289	NB: 46 SB: 40
Medium Truck	NB: 1 SB: 2	NB: 39 SB: 34	NB: 1 SB: 2	NB: 45 SB: 22	NB: 0 SB: 5	NB: 0 SB: 41
Heavy Truck	NB: 4 SB: 1	NB: 40 SB: 40	NB: 1 SB: 5	NB: 39 SB: 33	NB: 1 SB: 1	NB: 41 SB: 34
Bus	NB: 0 SB: 0	NB: 0 SB: 0	NB: 0 SB: 1	NB: 0 SB: 30	NB: 0 SB: 1	NB: 0 SB: 39
Motorcycle	NB: 0 SB: 0	NB: 0 SB: 0	NB: 1 SB: 1	NB: 35 SB: 35	NB: 0 SB: 0	NB: 0 SB: 0

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Site Sketch

Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022 **Measurement Taken by:** SE 12:48

**Project:** SR 535

**Site ID:** FR5 Run 1

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 92.6 End: 93 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 0 Max: 3.5 Average: 1.4 (mph)

Wind Speed (End): Min: 0.4 Max: 4.6 Average: 1.3 (mph)

Humidity Start: 63.1 End: 59.3 (%)

#### Equipment Data

Sound Level Meter: CEL-246 Serial Number 50' Run 13 1443727 100' Run 13 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 65.1/61.6  
in dB(A)

Major Noise Sources:

Background Noise Sources: Helicopter min 9:55, 6:00

Other Notes/Observations:

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Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 12:58 PM

**Project:** SR 535

**Site ID:** FR5 Run 2

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 92.7 End: 93.6 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 0.4 Max: 6.7 Average: 2.3 (mph)

Wind Speed (End): Min: 0.4 Max: 3.7 Average: 2.1 (mph)

Humidity Start: 55.3 End: 55.3 (%)

#### Equipment Data

Sound Level Meter: CEL-246 Serial Number 50' Run 14 1443727 100' Run 14 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 64/60.5  
in dB(A)

Major Noise Sources: \_\_\_\_\_

Background Noise Sources: \_\_\_\_\_

Other Notes/Observations: \_\_\_\_\_

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Site/Run #

### Noise Measurement Data Sheet

**Date:** 8/9/2022

**Measurement Taken by:** SE 1:09 PM

**Project:** SR 535

**Site ID:** FR5 Run 3

**Weather Conditions** Clear Partly Cloudy ✓ Cloudy Other

Temperature Start: 94.9 End: 95.6 (°F)

Wind Direction Start: SSE End: SSE

Wind Speed (Start): Min: 0.5 Max: 3.6 Average: 0.9 (mph)

Wind Speed (End): Min: 0 Max: 1.6 Average: 0.7 (mph)

Humidity Start: 55.4 End: 54.5 (%)

#### Equipment Data

Sound Level Meter: CEL-246 Serial Number 50' Run15 1443727 100' Run15 3173221

Date of Last Traceable Calibration: 8/9/2022

Calibration: Start: ✓ End: ✓ Difference: 0.0

Battery: Start: Full End: Full

Weighting Scale: A Response:

Calibrator: CEL-120 Serial Number: 3574097

**Results:** Leq: 63.3/59.7  
in dB(A)

Major Noise Sources: \_\_\_\_\_

Background Noise Sources: \_\_\_\_\_

Other Notes/Observations: \_\_\_\_\_

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Observed Traffic Data

Observed Traffic Data

Site #: FR3

Run #: 1-3

Vehicle Types	FR3-1		FR3-2		FR3-3	
	Volume	Speed	Volume	Speed	Volume	Speed
Auto	NB: 145 SB: 124	NB: 40 SB: 40	NB: 130 SB: 118	NB: 40 SB: 41	NB: 204 SB: 131	NB: 42 SB: 40
Medium Truck	NB: 2 SB: 2	NB: 44 SB: 44	NB: 0 SB: 1	NB: 0 SB: 36	NB: 1 SB: 2	NB: 37 SB: 37
Heavy Truck	NB: 4 SB: 3	NB: 32 SB: 34	NB: 1 SB: 1	NB: 34 SB: 34	NB: 3 SB: 0	NB: 37 SB: 0
Bus	NB: 0 SB: 0	NB: 0 SB: 0	NB: 1 SB: 1	NB: 30 SB: 30	NB: 0 SB: 0	NB: 0 SB: 0
Motorcycle	NB: 1 SB: 0	NB: 38 SB: 0	NB: 0 SB: 1	NB: 0 SB: 58	NB: 1 SB: 0	NB: 40 SB: 0

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Site Sketch