

DESIGN NOISE STUDY REPORT

Florida Department of Transportation District One

SR 29 Labelle Design Project

Limits of Project: from County Road (CR) 80A (Cowboy Way) to CR 731 (Whidden Road)

Hendry and Glades Counties, Florida

Financial Project ID: 417878-8-32-01

ETDM Number: 5531

Date: April 2025

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

Executive Summary

The Florida Department of Transportation (FDOT) District One is conducting a Project Development and Environment (PD&E) Study to evaluate options for improvements to SR 29 in LaBelle, Hendry and Glades Counties, Florida. The study limits extend from south of CR 80A (Cowboy Way) to north of CR 731 (Whidden Road), a distance of approximately 3 miles (see **Figure 1-1**). The purpose of the project is to provide capacity and operational improvements to the existing facility by upgrading to a four-lane facility, including the addition of a new bridge over the Caloosahatchee River.

This Design Noise Study Report (DNSR) was prepared to document the areas identified in the PD&E Noise Study Report (NSR) as either having noise impacts or a potentially reasonable and feasible noise barrier system. There was also one neighborhood, Maple Corner Mobile Home Park, that had a number of relocations of first row homes directly adjacent to SR 29 planned for during the PD&E that precluded it from consideration for noise abatement. Those relocations are no longer anticipated so this neighborhood was analyzed for impacts and noise abatement.

A total of 194 receptors representing 136 residences and 7 Special Land Use (SLU) sites located adjacent to SR 29 were evaluated for traffic noise related impacts associated with the widening of SR 29 within the project limits. With the proposed widening, the exterior traffic noise levels for the future year (2040) build alternative are predicted to range from 42.6 dB(A) to 72.9 dB(A). Noise levels at 38 residences and 3 SLUs are predicted to approach or exceed the NAC established by the Federal Highway Administration (FHWA) for the Build condition.

Noise barriers were evaluated for the impacted receptors. The results of the noise barrier evaluation are summarized in Table 4-1. Noise barrier systems (see **Table 4-1** for more detail on the noise barriers) were determined to be feasible and reasonable abatement measures for the Maple Corner Mobile Home Park and Whisper Creek RV Resort. Although preliminary analysis indicates that noise barriers are potentially feasible and reasonable, FDOT must still confirm whether benefited residents desire their construction. During the public involvement process, FDOT will actively gather community input through noise abatement workshops and surveys to ensure a majority (>50%) of responding residents and property owners support the proposed barriers. This input process ensures noise barriers reflect the preferences of those directly affected before final decisions regarding construction are made.

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1. PROJECT SUMMARY

FDOT District One is conducting a PD&E Study to evaluate options for improvements to SR 29 in LaBelle, Hendry and Glades Counties, Florida. The study limits extend from south of CR 80A (Cowboy Way) to north of CR 731 (Whidden Road), a distance of approximately 3 miles (see **Figure 1-1**). The purpose of the project is to provide capacity and operational improvements to the existing facility by upgrading to a four-lane facility, including the addition of a new bridge over the Caloosahatchee River.

This Design Noise Study Report (DNSR) was prepared to document the areas identified in the PD&E NSR as either having noise impacts or a potentially reasonable and feasible noise barrier system. There was also one neighborhood, Maple Corner Mobile Home Park, that had a number of relocations of first row homes directly adjacent to SR 29 planned for during the PD&E that precluded it from consideration for noise abatement. Those relocations are no longer anticipated so this neighborhood was analyzed for impacts and noise abatement.

1.1 PURPOSE AND NEED

The purpose of this project is to improve traffic operational conditions along the SR 29 corridor from CR 80A (Cowboy Way) to north of CR 731 (Whidden Road) to accommodate projected travel demand, specifically increased freight and commuter traffic. SR 29 is a designated Strategic Intermodal System (SIS) facility. Traffic flow within the corridor is of particular concern given the high percentage of heavy trucks and their unique acceleration and deceleration characteristics which cause vehicular travel delay and, ultimately, impact the movement of freight and commuter traffic on the two- to three-lane roadway.

The project also enhances interregional connectivity between key economic regions in Florida as well as regional emergency response and evacuation needs while improving safety for the efficient movement of people and freight. The need for the project is based on the following primary and secondary criteria.

1.1.1 PRIMARY CRITERIA

Capacity/Transportation Demand: Improve Operational Conditions

This project is anticipated to improve traffic operations and preserve operational capacity along SR 29 to address increased travel demand (particularly increased commuter and freight traffic). This travel demand is spurred by projected population and employment growth along the corridor and higher volumes of heavy trucks on the corridor due to increased industrial and agricultural activities in the area.

The six-county region (DeSoto, Glades, Hendry, Hardee, Highlands and Okeechobee) of the Heartland Regional Transportation Planning Organization (HRTPO) is expected to experience a 33 percent population increase from 253,399 in 2010 to 336,600 in 2040. Similarly, total employment for the region is expected to grow from 101,721 in 2011 to 134,178 in 2040, a 32 percent increase. Future traffic volumes for the region are anticipated to increase based on the generated population and employment forecasts.

If the projected capacity deficiency is not addressed for the project segment (particularly for the portion within Hendry County), it is anticipated that the facility volume-to-capacity (V/C) ratio will increase to 1.59 V/C by 2040. A roadway is deemed deficient if the volume-to-capacity ratio exceeds 0.9 as it has surpassed its designated service volume and level of service (LOS) standard. Given that SR 29 is a designated SIS facility, and the project portion of the roadway is located outside of an urban area, the LOS standard for the facility is LOS "C". Without the proposed improvements, travel conditions along the corridor will continue to deteriorate, resulting in a failing LOS by 2040. This will contribute to higher

levels of congestion and delays, particularly hindering the north-south movement of freight traffic in the southwest portion of the State.

1.1.2 SECONDARY CRITERIA

Enhance Freight Mobility And Economic Competitiveness

The project predominantly occurs within Hendry County, which is a designated Rural Area of Opportunity (a Florida Legislature designation that encourages and facilitates the location and/or expansion of major economic development projects of significant scale in designated rural communities). In addition, the project falls within the Hendry County Enterprise Zone and the Glades County Enterprise Zone as well as within a Foreign Trade Zone designation (implemented to assist companies in streamlining the process and minimizing costs associated with qualified importing, exporting, manufacturing and distribution activities), further emphasizing the importance of goods movement and trade. Based on the HRTPO 2040 Long Range Transportation Plan, the “region’s future economic climate” is projected to be supported by agriculture, healthcare, mining, warehousing, ecotourism, and services industries as well as energy and trade focused economies.

Designated as part of Florida’s SIS network and classified as a regionally significant freight roadway by the HRTPO, SR 29 serves regional through movements for long-haul truck volumes, as well as provides regional freight access to agriculture and ranching operations, industrial/commercial areas, and freight distribution facilities throughout southwest Florida, principally due to its connections to I-75, SR 80, and US 27. According to the SIS Highway Component for Current and Future Heavily Congested Corridors Report prepared in 2014 by the Florida Department of Transportation, the SR 29 project segment is anticipated to become a heavily congested corridor by year 2040 if it remains a two-lane undivided facility. Furthermore, the need for increased capacity or widening of SR 29 is classified as a very high priority investment in the Florida Freight Mobility and Trade Plan Investment Element dated September 2014.

Currently, the project segment of SR 29 has truck volumes that range from 12 percent to 15 percent. Florida’s SIS Highways are the backbone of the highway transportation network; this network consists of nearly 4,400 miles of roadways. While this mileage represents only 3 percent of the total state roadway mileage, the network supports 54 percent of all traffic and 70 percent of all truck traffic on the State Highway System. These significant corridors connect all of Florida’s economic regions including economic markets beyond Florida. Within the State, this network facilitates the movement of passengers and goods between the major airports, seaports, rail facilities, and notable intermodal hubs. As travel demand along SR 29 is expected to continue to increase, improvements to traffic operational conditions along the corridor will:

- Alleviate congestion along this critical southwest Florida link, and
- Enhance and sustain overall access to local and regional freight distribution centers and the circulation of goods.

FIGURE 1 PROJECT LOCATION MAP



1.1.3 SAFETY CONDITIONS: Enhance Safety Along The Corridor

Crash data reviewed for the 2011-2013 period along the project corridor revealed a total of 133 incidents, including 51 injuries and 1 fatality. The high percentage of heavy trucks on the corridor and their unique acceleration and deceleration characteristics may have contributed to the reported crashes. It should be noted that as the volume of traffic increases along the corridor, the opportunity for vehicle movement conflict is expected to increase.

SR 29 is also a designated HRTPO emergency evacuation route, which is consistent with the evacuation route network established by the Florida Division of Emergency Management.

The proposed project is anticipated to:

- Improve safety characteristics of the facility, which are particularly exacerbated by the high truck percentages, by enhancing overall traffic operations, and
- Enhance evacuation and response times by improving overall evacuation capacity and traffic circulation.

1.2 PROJECT DESCRIPTION

SR 29 is an SIS facility from SR 82 in Collier County (south of this project's study limits) to US 27 in Glades County (north of this project's study limits). Within the study limits, from CR 80A (Cowboy Way) to CR 731 (Whidden Road), SR 29 currently consists of two- and three-lane urban and rural facilities. SR 29 (Main Street) from CR 80A to SR 80 is a three-lane urban facility with one travel lane in each direction and a two-way center left-turn lane. Within the same area, SR 29A (Bridge Street) is also a three-lane urban facility. At SR 80, the designation of SR 29 shifts from Main Street to Bridge Street, as shown in **Figure 1-2**.

From SR 80 to the Caloosahatchee River Bridge, SR 29 (Bridge Street) continues as a three-lane urban facility and is within the Downtown LaBelle Historic District. Main Street in this area is a two-lane urban roadway.

The Caloosahatchee River Bridge crossing is a two-lane urban roadway. From north of the bridge to CR 731 (Whidden Road), SR 29 is a two-lane undivided rural facility.

The project is located within Sections 28, 29, 32, and 33 of Township 42 South, Range 29 East and within Sections 4, 5, 8, 9, 16, and 17 of Township 43 South, Range 29 East.

FIGURE 2 EXISTING SR 29 DESIGNATION



1.3 PROPOSED ACTION

The proposed action is to increase the capacity of the existing two- and three-lane facility to a four-lane facility to accommodate for the Purpose and Need stated in the previous section. The following section discusses those Build Alternatives considered, including the No-Build Alternative.

Six build alternatives were developed for analysis. The six alternatives are comprised of three primary alignments (Alternatives 1-3); each with two design options at the intersections of Main Street and Bridge Street at CR 80A (Cowboy Way). The two design options at the intersection with CR 80A (Cowboy Way) include Option A which would consist of two signalized intersections (similar to what exists now); and Option B which would install a modern roundabout. Either of these intersection options could be used with any of the three primary build alternatives under consideration. The build alternatives considered are shown in **Appendix A**. Below are brief descriptions of the six build alternatives as well as the no-build alternative.

1.3.1 ALTERNATIVE 1

Alternative 1 is a one-way pair that would utilize Bridge Street for two northbound lanes and Main Street for two southbound lanes from CR 80A (Cowboy Way) to north of the Caloosahatchee River. With this alternative, the existing two-lane bascule bridge on Bridge Street would be replaced and a second two-lane bascule bridge would be constructed at Main Street. For Alternative 1, the two bridge crossings would begin at the northern termini of Main and Bridge Streets.

Alternative 1 with Option A – Signalized Intersections

Alternative 1 with Option A would include all of the design components described in **Section** above, with two signalized intersections installed at CR 80A (Cowboy Way), similar to what is there currently.

Alternative 1 with Option B – Modern Roundabout

Alternative 1 with Option B would include all of the design components described in **Section** above with installation of a new roundabout at CR 80A (Cowboy Way).

1.3.2 ALTERNATIVE 2

Alternative 2 is also a one-way pair alternative that would utilize Bridge Street for two northbound lanes and Main Street for two southbound lanes. With this alternative, the existing two-lane bascule bridge on Bridge Street would be replaced and a second two-lane bascule bridge would be constructed at the realigned Main Street. Additionally, Main Street would be shifted to the east just north of Curry Street and re-routed along the east side of the existing library. With this alternative, existing Main Street will be closed north of Fort Thompson Road and new access will be provided for properties on the west side of Main Street.

Alternative 2 with Option A – Signalized Intersections

Alternative 2 with Option A would include all of the design components described in **Section** above, with two signalized intersections installed at CR 80A (Cowboy Way).

Alternative 2 with Option B – Modern Roundabout

Alternative 2 with Option B would include all of the design components described in **Section** above with installation of a new roundabout at CR 80A (Cowboy Way).

1.3.3 ALTERNATIVE 3

Alternative 3 is also a one-way pair alternative that would utilize Bridge Street for two northbound lanes and Main Street for two southbound lanes. With this alternative, the existing two-lane bascule bridge at Bridge Street would be replaced and a second two-lane bascule bridge would be constructed at Main

Street. The two bridge crossings will start at the northern ends of the current locations of Main and Bridge Streets and will merge to a four-lane suburban roadway north of the river, at Buser Avenue. Alternative 3 crosses the Caloosahatchee River at the same point as Alternative 1 from Main Street, but north of the bridge it shifts to the east sooner to avoid impacts to the Handy Mart.

Alternative 3 with Option A - Signalized Intersections

Alternative 3, Option A would include all of the design components described in Section 1.4.3 above, with two signalized intersections installed at CR 80A (Cowboy Way), similar to what is there currently.

Alternative 3 with Option B – Modern Roundabout

Alternative 3, Option B would include all of the design components described in Section 1.4.3 above with installation of a new roundabout at CR 80A (Cowboy Way).

1.3.4 NO-BUILD ALTERNATIVE

In addition to the build alternatives, the no-build scenario remains a viable alternative throughout the study process. It assumes that traffic volumes continue to increase in the future while no capacity, turn-lane, or operational improvements are made to SR 29. Only routine maintenance would continue along the roadway. While the no-build alternative does not meet purpose and need for this project as described in **Section 1.2** of this report, it requires no capital outlay for construction, causes no substantial increase in operation and maintenance of the of the existing roadway, and results in minimal environmental impacts.

1.3.5 RECOMMENDED ALTERNATIVE

After the Alternatives Public Workshop held on March 7, 2017, and a presentation to the City of LaBelle City Commission, it was determined to eliminate Alternatives 1 and 2 from further consideration as well as Option A [the signalized intersections at CR 80A (Cowboy Way)]. At their regularly scheduled City Commission meeting on April 13, 2017, the City of LaBelle stated their support for Alternative 3 with Option B (the modern roundabout). A certified copy of the minutes of their meeting can be found in the project files. As a result, Alternative 3 has been selected as the Recommended Alternative to be carried forward for more detailed analysis.

Alternative 3 consists of a one-way pair that would utilize Bridge Street for two northbound lanes and Main Street for two southbound lanes. With this alternative, the existing two-lane bascule bridge at Bridge Street will be replaced and a new two-lane bascule bridge will be constructed at Main Street. The two bridge crossings will start at the northern ends of the current locations of Main and Bridge Streets and will merge to a four-lane rural roadway north of the river, at Buser Avenue. Alternative 3 will also replace the existing signalized intersection at CR 80A (Cowboy Way) with a modern roundabout. North of the bridge, this alternative shifts to the east to avoid impacts to the Handy Mart.

2 METHODOLOGY

The traffic noise study was conducted in accordance with Title 23, Part 772 of the Code of Federal Regulations (23 CFR Part 772) *Procedures for Abatement of Highway Traffic Noise and Construction Noise*¹. The methodology used for this study follows the policies and procedures established by FDOT in the *PD&E Manual*, Part 2, Highway Traffic Noise Chapter², and the *Traffic Noise Modeling and Analysis Practitioners Handbook*³. Predicted noise levels were generated using the FHWA Traffic Noise Model (TNM), version 2.5.

2.1 Noise Metrics

Noise levels for this analysis are expressed in decibels (dB) using an A-weighted scale [dB(A)], which closely approximates the human ear's response. All reported noise levels represent the hourly equivalent noise levels [Leq(h)]. The Leq is defined as *"the equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with Leq(h) being the hourly value of Leq."*². Use of the dB(A) and Leq(h) metrics to evaluate traffic noise is consistent with 23 CFR 772¹.

2.2 Traffic Data

Traffic noise is heavily dependent on both traffic speed and traffic volume with the amount of noise generated by traffic increasing as the vehicle speed and number of vehicles increases. Traffic volumes and vehicle mix (e.g. cars, medium trucks, heavy trucks, motorcycles and buses) were predicted for the design year (2040) for the Build Condition. Level of Service (LOS) C traffic volumes were utilized for the prediction of roadway related noise for the future build condition to represent the worst-case traffic scenario for the 2040 Build alternative. Traffic volumes and speeds used in the analysis are provided in Appendix A.

2.3 Noise Abatement Criteria

A noise-sensitive site is any property where frequent exterior or interior human use occurs and where a reduction in noise would be beneficial. FHWA has established Noise Abatement Criteria (NAC) for various types of noise-sensitive sites. These criteria, adopted by FDOT for traffic noise evaluation, are shown in **Table 2-1**. Noise abatement measures are considered when predicted noise levels approach or exceed the NAC. FDOT defines "approach" as being within one dB(A) of the applicable FHWA criterion. **Figure 2** provides a comparison of typical noise levels for common indoor and outdoor activities. Predicted traffic noise levels, NAC classification, and impact criteria for all residential receptors are documented in **Appendix B**.

Noise abatement must also be considered if a transportation project results in a substantial increase in traffic noise. A substantial increase is defined as an increase of 15 dB(A) or more above existing conditions. A substantial increase typically occurs in areas where traffic noise is currently a minor component of the existing noise environment but would become a dominant factor after project completion (e.g., a new alignment project). Because this project follows the existing alignment of SR 29, the PD&E noise analysis determined that a substantial increase in traffic noise will not occur. Predicted traffic noise levels, NAC classification, and impact criteria for all SLU receptors are documented in **Appendix B**.

2.4 Noise Abatement Measures

Noise abatement measures are considered when projected traffic noise levels approach or exceed the **Noise Abatement Criteria (NAC)** (see **Table 2-1** for details) or increase substantially. The feasibility and reasonableness of these measures are evaluated based on noise reduction potential, cost, engineering constraints, and community impact.

2.4.1 Traffic Management Measures

Speed limits, vehicle restrictions, and signal timing adjustments can reduce noise but may conflict with roadway mobility needs. For example, restricting heavy trucks would lower noise but disrupt freight movement. Given these trade-offs, traffic management is not a feasible noise abatement measure.

2.4.2 Alignment Modifications

Shifting the roadway alignment can reduce noise but would require significant **right-of-way (ROW)** acquisition, causing property impacts and environmental concerns. Vertical adjustments are also

impractical due to design constraints. Therefore, alignment modifications are not reasonable for this project.

2.4.3 Land Use Controls

Buffer zones and zoning regulations can minimize noise impacts for future development. While not a direct mitigation strategy for existing receptors, noise contours have been developed to guide local land use planning.

2.4.4 Noise Barriers

Noise barriers are the preferred method of noise abatement, effectively reducing traffic noise for adjacent sensitive areas. When implemented, they provide a significant reduction in noise levels and are a key mitigation strategy for minimizing impacts on nearby receptors.

3 TRAFFIC NOISE ANALYSIS

3.1 Noise Sensitive Sites and Impact Analysis

Within the project limits, residential and non-residential sites were evaluated. Receptors representing noise-sensitive sites were digitized in the noise model following the FDOT PD&E Manual² as follows:

- **Residential receptors:** Placed at areas of frequent exterior use (e.g., patio or lanai) or at the corner of the residential building closest to the primary traffic noise source.
- **Special Land Use (SLU) receptors:** Located in areas with frequent outdoor human use. For large spaces, such as parks, receptors are arranged in a grid pattern.
- **Representative receptor:** For clusters of residences, a single representative receptor is analyzed for a group of similar sites.
- **Ground floor receptors:** Assumed to be 5 feet above ground elevation.

The locations of the receptors are shown on project aerials in **Appendix C**.

3.2 Receptor Naming System:

Each receptor is identified by a unique code:

- **First Letter:** "R" for residential receptors or "S" for SLU receptors.
- **Next Two Letters:** indicate the roadway side (e.g., "NB" for northbound, "SB" for southbound).
- **Next Two-Digit Number:** Represents the Common Noise Environment (CNE) identifier.
- **Final Three-Digit Number:** Separated by a dash, this denotes the specific receptor (e.g., RSB03-002 is the 2nd residential receptor in the 3rd CNE on the southbound side).

A total of 194 receptors representing 136 residences and 7 SLU sites located adjacent to SR 29 were evaluated for traffic noise related impacts associated with the widening of SR 29 within the project limits. With the proposed widening, the exterior traffic noise levels for the future year (2040) build alternative are predicted to range from 42.6 dB(A) to 72.9 dB(A). Noise levels at 38 residences and 3 SLUs are predicted to approach or exceed the NAC established by the Federal Highway Administration (FHWA) for the Build condition.

Predicted noise levels for the design year are included in **Appendix B**, while receptor locations are illustrated in **Appendix C**.

Table 2-1 – FHWA Noise Abatement Criteria

NOISE ABATEMENT CRITERIA (NAC) [Hourly A-Weighted Sound Level-decibels (dB(A))]				
Activity Category	Activity Leq(h) ¹		Evaluation location	Description of activity category
	FHWA	FDOT		
A	57	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B ²	67	66	Exterior	Residential
C ²	67	66	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E ²	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	–	–	–	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	–	–	–	Undeveloped lands that are not permitted.
<p><i>(Based on Table 1 of 23 CFR Part 772)</i></p> <p>¹ The Leq(h) Activity Criteria values are for impact determination only and are not design standards for noise abatement measures.</p> <p>² Includes undeveloped lands permitted for this activity category.</p> <p><i>Note:</i> FDOT defines that a substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 decibels or more as a result of the transportation improvement project. When this occurs, the requirement for abatement consideration will be followed.</p>				

Figure 3 – Typical Noise Levels

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

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

3.3 Noise Abatement Analysis

Receptors were grouped into CNEs to evaluate the feasibility and reasonableness of noise abatement measures. Noise barriers mitigate traffic noise by blocking the sound path between the roadway and noise-sensitive sites. Effective noise barriers are sufficiently long, continuous (without gaps), and of adequate height. For a noise barrier to be considered for construction, it must meet feasibility and reasonableness criteria:

Feasibility Criteria:

- Must provide at least a 5 dB(A) reduction in traffic noise to at least two impacted receptors.
- Must consider design, construction, safety, access, ROW constraints, maintenance, drainage, and utility factors.

Reasonableness Criteria:

- Must meet FDOT's Noise Reduction Design Goal (NRDG), by reducing noise at least 7 dB(A) for at least one benefited receptor.
- Must satisfy FDOT's cost threshold of \$64,000 per benefited receptor (defined as a receptor receiving at least a 5 dB(A) reduction). The current unit cost used to evaluate cost reasonableness is \$40 per square foot, covering materials and labor.
- Must incorporate community feedback from affected property owners and residents.

For CNEs with impacted receptors, noise barriers were evaluated at heights from 8 to 14 feet (in 2-foot increments) placed outside the clear recovery zone but within the ROW. This approach identifies the maximum number of impacted receptors that could achieve at least a 5 dB(A) reduction in traffic-related noise. Barrier placement is often constrained by conditions such as overhead utilities.

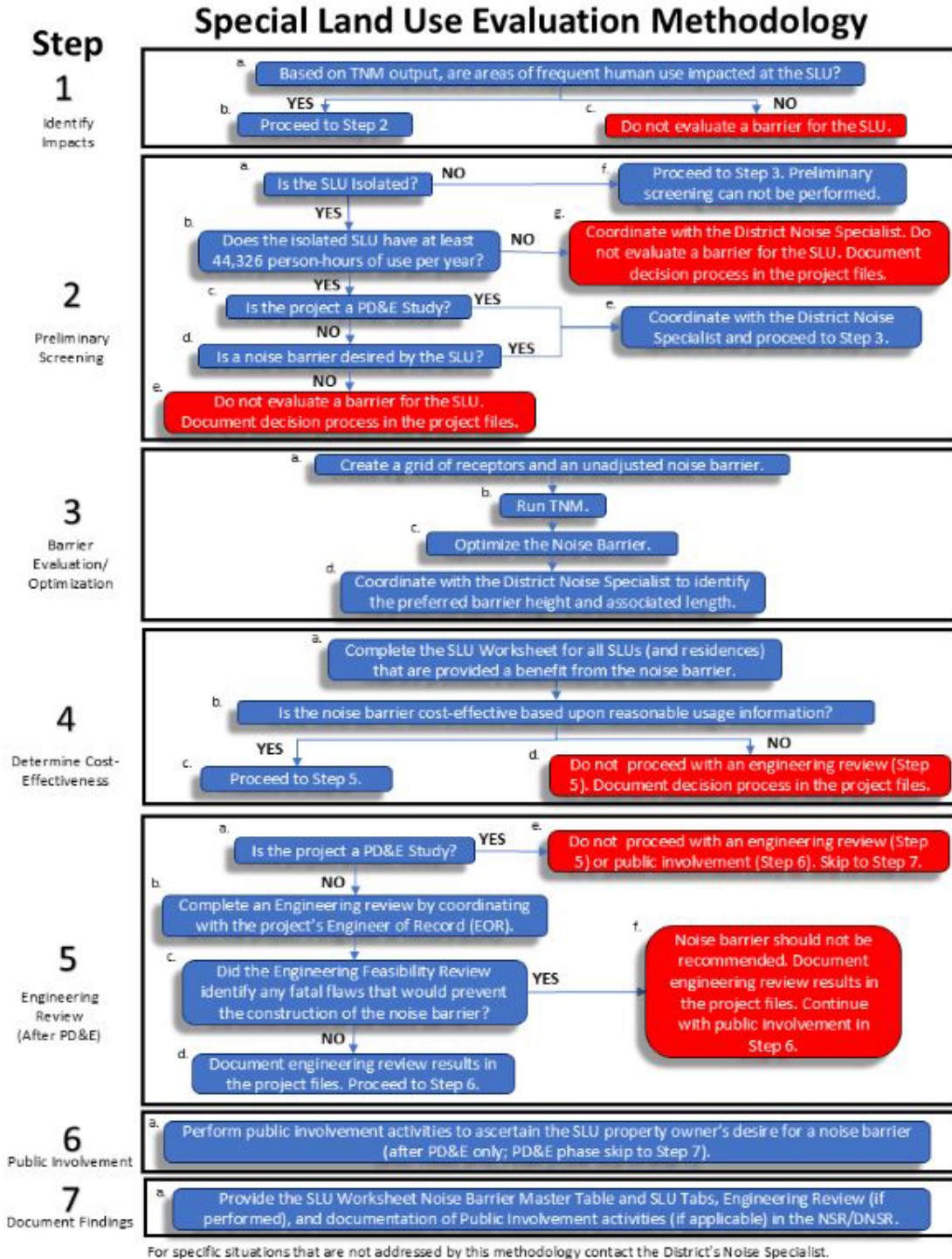
In some areas, barriers may also benefit receptors that do not approach the NAC. Because abatement is not required for these receptors, barrier height or length is not increased solely for their benefit. However, when these receptors receive a benefit due to their proximity to an impacted receptor, they are included in the cost reasonableness evaluation, which is calculated on a cost-per-benefited-receptor basis. This methodology aligns with FHWA policy and guidance.

3.4 Special Land Use (SLU) Analysis

FDOT's *Methodology to Evaluate Highway Traffic Noise at Special Land Uses*⁵ replaces the previous 1997/2009 guidance and addresses several limitations in the former approach. This comprehensive seven-step process (as shown in Figure 3) begins with identifying impacts at non-residential SLU noise sensitive sites in FHWA's NAC Activity Categories A, C, D, and E. There is also an optional preliminary screening process to reduce unnecessary analysis of isolated, low-usage SLUs that historically wouldn't qualify for noise abatement.

A significant change in the new methodology is the Equivalent Residence (ER) approach, which allows for combined evaluation of impacted SLUs and adjacent impacted residential areas. This calculation converts SLU usage to residential equivalents based on person-hours of use. One ER equals 22,163 person-hours annually (calculated from an average Florida residence with 2.53 people available 24 hours daily year-round). The subsequent steps include TNM barrier evaluation and optimization, cost-effectiveness determination using the FDOT SLU Worksheet with a current reasonableness threshold of \$64,000 per benefited residence or ER, engineering feasibility review (during design phase), public involvement, and documentation of findings.

Figure 4 – SLU Methodology Flowchart



4 Common Noise Environments

4.1 Northbound Side of SR 29

4.1.1 First Baptist Church of Labelle (CNE SB01)

The First Baptist Church of Labelle is located on the northwest corner of Main Street and Fort Thompson Avenue. This area is shown on sheet 1 of the project aerials located in **Appendix C**. The model includes one NAC D receptor representing indoor use at the church since no clear area of frequent outdoor use was identified. A noise reduction factor of 25 dB (for a masonry building with single glazed windows) was applied to the modeled results at this location to account for the reduction in noise provide by the building structure for the interior use at this location. Predicted noise levels are not expected to approach or exceed the NAC for the Build Condition in Design Year 2040. Therefore, no noise barriers were evaluated to abate traffic-related noise. The predicted noise levels for residential sites are provided in **Appendix B**.

4.1.2 Rising Starz (CNE SB02)

The Rising Starz childcare facility is located on the northbound side of Main Street, north of Fort Thompson Avenue. This area is shown on sheet 1 of the project aerials located in **Appendix C**. The model includes a grid of nine NAC C receptors representing outdoor use at the facility playground. Noise levels are predicted to approach or exceed the NAC for the Build condition at three receptors. The predicted noise levels for SLU sites are provided in **Appendix B**.

Because noise impacts were predicted for the SLU site, the SLU Evaluation methodology detail in Section 3.4 is used to evaluate this site. Noise impacts were identified at three receptors within the site. The next step in the evaluation was to determine whether this location qualifies as an isolated SLU. Based on the surrounding land uses, and with no other impacted residential or SLU receptors in the area, the site was determined to be an isolated SLU.

A preliminary screening was then conducted to assess whether the site meets the minimum usage threshold of 44,326 person-hours per year. According to a phone conversation with a staff member on April 4, 2025, the current enrollment is 72 students with up to 18 staff members. Children reportedly spend up to 1.5 hours outdoors per day. Assuming a total of 90 individuals on site, each spending 1.5 hours outdoors per day, five days a week, year-round (52 weeks), the estimated annual usage is approximately 35,100 person-hours. This is below the minimum threshold (44,326 person-hours per year) required for noise abatement consideration. As the minimum person-hour requirement is not met, no further noise abatement analysis was conducted for this site.

4.1.3 Single Family Residences (CNE SB03)

Two single family homes are located on the southbound side of Main Street between the Park Avenue and DeSoto Avenue. This area is shown on sheet 1 of the project aerials located in **Appendix C**. The model includes two NAC B receptors representing areas of outdoor use at the two homes. Noise levels at these sites are not predicted to approach or exceed the NAC for the Build condition and therefore noise abatement was not considered for CNE SB03. The receptor points representing CNE SB03 are shown in the project aerials located in Appendix C and the predicted noise levels are shown in **Appendix B**.

4.1.4 Barron Library (CNE SB04)

The Barron Library is located on the northbound side of Main Street between the Park Avenue and DeSoto Avenue. This area is shown on sheet 1 of the project aerials located in **Appendix C**. The model includes one NAC D receptor representing interior use at this site as no outdoor use areas were identified for the library. A noise reduction factor of 25 dB (for a masonry building with single glazed

windows) was applied to the modeled results at this location to account for the reduction in noise provide by the building structure for the interior use at this location. Noise levels at this site is not predicted to approach or exceed the NAC for the Build condition and therefore noise abatement was not considered for CNE SB04. The receptor points representing CNE SB04 are shown in the project aerials located in Appendix C and the predicted noise levels are shown in **Appendix B**.

4.1.5 LaBelle City Dock Park (CNE SB05)

The LaBelle City Dock Park is located along Desoto Avenue west of SR 29. This area is shown on sheet 1 of the project aerials located in **Appendix C**. The model includes two NAC C receptors representing a 4 park benches near the city docks. There are boat slips at the city docks but city ordinance limits stays at these docks to 3 days, so the boats docks would not be considered residential sites. Noise levels are predicted to approach or exceed the NAC for the Build condition at one receptor. The predicted noise levels for SLU sites are provided in **Appendix B**.

Because noise impacts were predicted for the SLU site, the SLU Evaluation methodology detail in Section 3.4 is used to evaluate this site. Noise impacts are predicted for one receptor, so the next step is to determine if this is an isolated SLU. This is considered an isolated SLU as there are no other impacted residences or SLUs in this area. The next step is to perform the preliminary screen process to determine if the site meets the minimum usage threshold of 44,326 person-hours of use per year. If all 4 benches had 2 people sitting on the for a full 12 hours each day, 7 days a week, 52 weeks a year, they would still only generate 34,944 person-hours of use per year. That does not meet the minimum number of person hours to qualify for noise abatement consideration, so no further analysis was conducted.

4.1.6 The Inn at Labelle Yacht Club (CNE SB06)

The Inn at Labelle Yacht Club is located on the southbound side of Old County Road 78 north of SR 29. This area is just north of the visible area, along the north bank of the river on sheet 1 of the project aerials located in **Appendix C**. The model includes one NAC E receptor representing outdoor use at the pool. Noise levels at this site are not predicted to approach or exceed the NAC for the Build condition and therefore noise abatement was not considered for CNE SB06. The predicted noise levels for the area are shown in **Appendix B**.

4.1.7 Single Family Residences and County Line Trailer Park (CNE SB07)

Two single family homes and the County Line Trailer Park are located on the southbound side of SR 29 between Nobels Road and Whidden Avenue. This area is shown on sheet 3-6 of the project aerials located in **Appendix C**. The model includes two NAC B receptors representing areas of outdoor use at the two homes. Noise levels at these sites are not predicted to approach or exceed the NAC for the Build condition and therefore noise abatement was not considered for CNE SB07. The receptor points representing CNE SB07 are shown in the project aerials located in Appendix C and the predicted noise levels are shown in **Appendix B**.

4.1.8 Maple Corner Mobile Home Park (CNE SB08)

The Maple Corner Mobile Home Park is located on the southbound side of SR 29 just north of Whidden Avenue. This area is shown on sheet 5 of the project aerials located in **Appendix C**. The model includes 17 NAC B receptors representing areas of outdoor use at 17 residences. Noise levels are predicted to approach or exceed the NAC for the Build condition at 12 of these residences. The receptor points representing CNE SB08 are shown in the project aerials located in Appendix C and the predicted noise levels are shown in **Appendix B**.

Noise barriers were evaluated for these residential sites to mitigate traffic related noise. Based on this evaluation, a potential noise barrier system located along the right-of-way could provide a 7 dB(A)

reduction at one or more receptors and a 5 dB(A) reduction at two or more impacted receptors. This noise barrier will not exceed the allowable \$64,000 per benefited receptor and therefore, noise barriers are a cost reasonable method to abate traffic related noise impacts for the residences and outdoor use sites in CNE SB08. **Table 4-1** summarizes the barrier configurations evaluated for CNE SB08.

Although preliminary analysis indicates that noise barriers are potentially feasible and reasonable, FDOT must still confirm whether benefited residents desire their construction. During the public involvement process, FDOT will actively gather community input through noise abatement workshops and/or surveys to ensure a majority (>50%) of responding residents and property owners support the proposed barriers. This input process ensures noise barriers reflect the preferences of those directly affected before final decisions regarding construction are made.

Table 4-1 – Maple Corner Mobile Home Park (CNE SB08)

Height (feet)	Length ¹ (feet)	No. of Impacts	Noise Reduction at Impacted Residences			Number of Benefited Residences				Impacted Res. Not Benefited ⁴	Total Estimated Cost ⁵	Cost per Benefited Residence
			5-5.9 dB(A)	6.0-6.9 dB(A)	> 7 dB(A)	Impacted ²	Not Impacted ³	Total	Average Reduction dB(A)			
14	580	12	1	0	11	12	2	14	9.3	0	\$492,800	\$35,200
14	300											
14	540	12	1	2	8	11	2	13	9.2	1	\$448,000	\$34,462
14	260											
12	580	12	0	1	10	11	1	12	8.9	1	\$422,400	\$35,200
12	300											

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

² Benefited residences with predicted noise levels that approach or exceed the NAC.

³ Benefited residences with predicted noise levels that do not approach the NAC.

⁴ Impacted residences that do not receive a minimum 5 dB(A) reduction from proposed noise barrier.

⁵ Unit cost of \$40/ft²

⁷ Noise barrier system did not meet the noise reduction design goal of a 7 dB(A) reduction at any receptor, so no further analysis was conducted.

4.1.9 Whisper Creek RV Resort (CNE SB09)

Whisper Creek RV Resort is located on the southbound side of SR 29 between Nobels Road and Whidden Avenue. This area is shown on sheet 1 of the project aerials located in Appendix C. The model includes 86 NAC B receptors representing areas of outdoor use at these residences. Noise levels are predicted to approach or exceed the NAC for the Build condition at 25 of these residences. The receptor points representing CNE SB09 are shown in the project aerials located in Appendix C, and the predicted noise levels are shown in **Appendix B**.

Noise barriers were evaluated for these residential sites to mitigate traffic-related noise. Based on this evaluation, a potential noise barrier system located along the right-of-way could provide a 7 dB(A) reduction at one or more receptors and a 5 dB(A) reduction at two or more impacted receptors. This noise barrier will not exceed the allowable \$64,000 per benefited receptor, and therefore noise barriers are a cost-reasonable method to abate traffic-related noise impacts for the residences in CNE SB09. **Table 4-2** summarizes the barrier configurations evaluated for CNE SB09.

Although preliminary analysis indicates that noise barriers are potentially feasible and reasonable, FDOT must still confirm whether benefited residents desire their construction. During the public involvement process, FDOT will actively gather community input through noise abatement workshops and/or surveys

to ensure a majority (>50%) of responding residents and property owners support the proposed barriers. This input process ensures noise barriers reflect the preferences of those directly affected before final decisions regarding construction are made.

Table 4-2 – Whisper Creek RV Resort (CNE SB09)

Height (feet)	Length ¹ (feet)	No. of Impacts	Noise Reduction at Impacted Residences			Number of Benefited Residences				Impacted Res. Not Benefited ⁴	Total Estimated Cost ⁵	Cost per Benefited Residence
			5-5.9 dB(A)	6.0-6.9 dB(A)	> 7 dB(A)	Impacted ²	Not Impacted ³	Total	Average Reduction dB(A)			
14	1490	25	3	1	21	25	47	72	8.4	0	\$834,400	\$11,589
14	1450	25	0	2	20	22	45	67	8.6	3	\$812,000	\$12,119
12	1490	25	1	2	20	23	44	67	7.9	2	\$715,200	\$10,675

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

² Benefited residences with predicted noise levels that approach or exceed the NAC.

³ Benefited residences with predicted noise levels that do not approach the NAC.

⁴ Impacted residences that do not receive a minimum 5 dB(A) reduction from proposed noise barrier.

⁵ Unit cost of \$40/ft²

⁷ Noise barrier system did not meet the noise reduction design goal of a 7 dB(A) reduction at any receptor, so no further analysis was conducted.

4.2 Southbound Side of SR 29

4.2.1 Single Family Residence (CNE NB01)

One isolated single-family residence is located on the northbound side of Bridge Street between the Fort Thompson Avenue and Park Avenue. This area is shown on sheet 1 of the project aerials located in **Appendix C**. The model includes one NAC B receptor representing areas of outdoor use at the home. Noise levels are not predicted to approach or exceed the NAC for the Build condition and therefore noise abatement was not considered for CNE NB01. The receptor point representing CNE NB01 is shown in the project aerials located in Appendix C and the predicted noise level is shown in **Appendix B**.

4.2.2 Barron Park (CNE NB02)

Barron Park is located on the northbound side of SR 29, between Park Avenue and DeSoto Avenue. This area is shown on sheet 1 of the project aerials located in **Appendix C**. The noise model includes 41 NAC C receptor points representing outdoor use areas at the park, comprising a grid of 38 receptors for the main park area and additional receptors along the riverbank representing benches and picnic tables. Noise levels are predicted to approach or exceed the NAC for the Build condition at 11 receptors. The predicted noise levels for SLU sites are provided in **Appendix B**.

Since noise impacts were identified at Barron Park, the evaluation proceeded according to the FDOT SLU methodology detailed in Section 3.4. The analysis confirmed Barron Park as an isolated SLU, with no other impacted residential or SLU receptors nearby. The preliminary screening indicated that Barron Park exceeds the minimum usage threshold of 44,326 person-hours per year, based on the available designated parking spaces and additional on-street parking capacity.

An 8-foot-tall noise barrier along the northbound edge of the SR 29 bridge was evaluated. However, modeling results showed that this configuration would not achieve the minimum required 5 dB(A) noise reduction for any impacted receptor. Due to the presence of side streets and the elevated structure of SR 29 at this location, the only viable placement for a noise barrier was at the edge of the bridge. Structural constraints associated with retaining walls and MSE walls at this location limit the maximum barrier height to 8 feet.

The barrier’s limited effectiveness is primarily due to these height restrictions, the constrained length near the SR 29 and Park Avenue intersection, and unshielded traffic noise from Park Avenue. As a result, a noise barrier at this location is determined to be neither feasible nor reasonable for noise abatement.

Detailed results of evaluated noise barrier scenarios are summarized in **Table 4-3**.

Table 4-3 – Barron Park (CNE NB02)

Height (feet)	Length ¹ (feet)	Location	No. of Impacted ER's	Impacted and Benefited ERs	Benefited ERs	Average Reduction dB(A)	Total Cost ²	Cost per Benefited ER	Barrier Reasonable and Feasible?
8	500	SH ³	1.32	0	0	N/A ⁴	N/A ⁴	N/A ⁴	N/A ⁴

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

² Unit cost of \$40/ft²

³ SH – SH noise barrier

⁴ Noise Barrier did not benefit an receptors by at least 5dB(A), so no further analysis was conducted.

4.2.3 Belle Hatchee Marina (CNE NB03)

The Belle Hatchee Marina is located on the northbound side of SR 29 just north of the Caloosahatchee River. This area is shown on sheet 2 of the project aerials located in **Appendix C**. The model includes three NAC E receptor representing outdoor use at an outdoor pool, playground, and lounge with outdoor seating at the marina. Noise levels at this site are not predicted to approach or exceed the NAC for the Build condition and therefore noise abatement was not considered for CNE NB03. The predicted noise levels for the area are shown in **Appendix B**.

4.2.4 Single Family Residences (CNEs NB04 and NB05)

Five scattered single-family homes are located on the northbound side of SR 29 between the Riverbend Drive and the northern limits of the project. This area is shown on sheets 2-7 of the project aerials located in **Appendix C**. The model includes five NAC B receptors representing areas of outdoor use at these residences. Noise levels at one home are predicted to approach or exceed the NAC for the Build condition. Since FDOT’s noise abatement criteria require at least two impacted residences to receive a minimum 5 dB(A) benefit to consider noise barriers, this location does not qualify for noise abatement. Therefore, noise barrier analysis was not performed. Receptor locations representing this area (CNEs NB04 and NB05) are provided in Appendix C, and predicted noise levels are detailed in **Appendix B**.

5 OUTDOOR ADVERTISING

A review of existing conditions confirmed that there are no existing, conforming, and legally permitted outdoor advertising signs located where noise barriers are proposed. Therefore, no conflicts or additional coordination related to outdoor advertising sign visibility or impacts are anticipated for this project.

6 CONCLUSIONS

A total of 194 receptors representing 136 residences and 7 SLU sites located adjacent to SR 29 were evaluated for traffic noise related impacts associated with the widening of SR 29 within the project limits. With the proposed widening, the exterior traffic noise levels for the future year (2040) build alternative are predicted to range from 42.6 dB(A) to 72.9 dB(A). Noise levels at 38 residences and 3 SLUs are predicted to approach or exceed the NAC established by the FHWA for the Build condition.

Table 5-1 – Noise Barrier Evaluation Summary

Noise Barrier System (CNEs included in barrier system)	Number of Impacted Residences	Noise Barrier Approx. Begin Station	Noise Barrier Approx. End Station	Noise Barrier Height (ft.)	Noise Barrier Length (ft.) ¹	Total Preliminary Barrier Cost ²	Number of Residences Potentially Benefited by a Noise Barrier		Total Noise Barrier System Cost Per Benefited Residence
							Impacted	Total ³	
Maple Corner Mobile Home Park (SB08)	12	2001+90	2007+40	14	580	\$492,800	12	14	\$35,200
		2007+60	2010+55	14	300				
Whisper Creek RV Resort (SB09)	25	2018+25	2033+05	14	1490	\$834,400	25	72	\$11,589

¹ Full height is for length indicated. The length for any required taper in height at a shoulder noise barrier termination would be in addition to the length indicated.

² Unit cost of \$40/ft² for all noise barriers

³ Total includes impacted/benefited residences and residences with a predicted noise level that does not approach or exceed 67 dBA, but are incidentally benefited.

Noise barriers were evaluated for the impacted receptors. The results of the noise barrier evaluation are summarized in Table 4-1. Noise barrier systems were determined to be feasible and reasonable abatement measures for the Maple Corner Mobile Home Park and Whisper Creek RV Resort. Although preliminary analysis indicates that noise barriers are potentially feasible and reasonable, FDOT must still confirm whether benefited residents desire their construction. During the public involvement process, FDOT will actively gather community input through noise abatement workshops and/or surveys to ensure a majority (>50%) of responding residents and property owners support the proposed barriers. This input process ensures noise barriers reflect the preferences of those directly affected before final decisions regarding construction are made.

7 CONSTRUCTION NOISE AND VIBRATION

Based on the existing land use within the limits of this project, construction of the proposed roadway improvements may have temporary noise and vibration impacts. Construction noise sensitive sites include all of the noise sensitive sites detailed in Section 4.0 of this report. Vibration sensitive sites on the project include residential neighborhoods, outdoor eating areas and seating, educational buildings, nature trails and a golf course. Trucks, compaction equipment, earth moving equipment, demolition equipment, pumps, and generators are sources of construction noise and vibration. During the construction phase of the proposed project, short-term noise and vibration may be generated by stationary and mobile construction equipment. The construction noise and vibration will be temporary at any location and will be controlled by adherence to the most recent edition of the *FDOT Standard Specifications for Road and Bridge Construction*⁵.

Should any noise or vibration issues arise during construction, the Project Engineer, in concert with the District Noise Specialist and the Contractor, will investigate additional methods of controlling these impacts.

8 PUBLIC INVOLVEMENT

Section will be added later when the public involvement effort is complete...

9 REFERENCES

1. **Federal Highway Administration.** *Procedures for Abatement of Highway Traffic Noise and Construction Noise.* Title 23, Code of Federal Regulations, Part 772 (23 CFR Part 772). Washington, D.C.: FHWA, July 13, 2011.
2. **Florida Department of Transportation.** *Project Development and Environment (PD&E) Manual – Part 2, Highway Traffic Noise Chapter.* Tallahassee, FL: FDOT, Jul. 31, 2024.
3. **Florida Department of Transportation.** *Traffic Noise Modeling and Analysis Practitioners Handbook.* Tallahassee, FL: FDOT, Dec. 2018.
4. **Florida Department of Transportation.** *Methodology to Evaluate Highway Traffic Noise at Special Land Uses.* Tallahassee, FL: FDOT, Dec. 2024.
5. **Florida Department of Transportation.** *Standard Specifications for Road and Bridge Construction.* Tallahassee, FL: FDOT, Jul. 2024.