Draft Noise Study Report Addendum

INTERSTATE 4 (I-4)/STATE ROAD 400 (SR 400) ULTIMATE PROJECT

FROM EAST OF KIRKMAN ROAD (SR 435) TO EAST OF SR 434

Orange and Seminole Counties, Florida

Financial Project ID Number: 432193-1-52-01

FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 5
719 South Woodland Boulevard
Deland, Florida 32720

July 2013
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1.0 Introduction

As part of the I-4 Ultimate Project, the Florida Department of Transportation (FDOT) is planning to improve Interstate 4 (I-4)/State Road 400 (SR 400) from east of Kirkman Road (SR 435) in Orange County to east of SR 434 in Seminole County (see Figure 1-1). The planned I-4 Ultimate Project is located within the limits of Section 2 of the I-4 Project Development and Environment (PD&E) Study (see Figure 1.0.1 in Appendix A). The initial Record of Decision (ROD) for the limits from west of Kirkman Road to the Orange/Seminole County line was approved by Federal Highway Administration (FHWA) on December 5, 2002. The ROD for the I-4 segment from the Orange/Seminole County Line to north of SR 434 was approved by FHWA on December 8, 2005. As part of the commitments made during the PD&E Study, a traffic noise study is being performed as part of the current Design Change/Construction Advertisement Reevaluation. This traffic noise study was conducted in accordance with FDOT’s PD&E Manual, Part 2, Chapter 17, Noise (May 24, 2011), Title 23 of the Code of Federal Regulations Part 772 (23 CFR 772), Procedures for Abatement of Highway Traffic Noise and Construction Noise (July 13, 2010), and FDOT’s Plans Preparations Manual, Volume 1, Chapter 32 Noise Barriers (July 1, 2013).

As part of the I-4 Section 2 PD&E Study, a noise study was conducted. The methods and results of this study are summarized in the Section 2 Noise Impact Report dated August 2002. The 2002 and 2005 RODs stated that noise barriers are considered reasonable and feasible at 11 noise sensitive areas (NSAs) including 2-E, 2-F, 2-H, 2-I, 2-J, 3-B, 3-C, 3-D, 3-E, 3-F, and 4-C. The general locations of the 11 noise barriers are shown in Figure 3.4.1 in Appendix A. The relevant pages referenced from the 2002 Noise Impact Report are included in Appendix A including Figure 2.3.1 that shows the locations of the NSAs from the 2002 Noise Impact Report. In the two RODs, FDOT committed to the implementation of reasonable and feasible noise abatement contingent upon the “Selective Alternative” meeting the following conditions during the design phase of the project:

- Detailed noise analyses during the final design process support the need for abatement;
- Reasonable cost analyses indicate that the economic cost of the barriers will not exceed the guidelines;
- Community input regarding desires, types, heights, and locations of barriers have been solicited by FDOT;
Figure 1-1 | Project Location Map

I-4 Ultimate From West of Kirkman Road to East of SR 434

- Construction Length: 21.11 Miles
- Construction Cost: Approximately $2 Billion
- Bridges: 56 New (Including Pedestrian Crossing), 68 Replacements, 13 Modifications
- Interchanges: 15 Major Interchanges Reconstructed
- Pedestrian Crossings: 1 New (Maitland Blvd.)
Preferences regarding compatibility with adjacent land uses, particularly as addressed by officials having jurisdiction over such land uses has been noted;

Safety and engineering aspects as related to the roadway user and the adjacent property owner(s) have been reviewed; and

Any other mitigating circumstances identified in Part 2, Chapter 17-4.6.1 of FDOT’s PD&E Manual have been analyzed.

Since the approval of the RODs, the FEIS has been reevaluated to address various design changes which were approved by FHWA on December 20, 2004, April 7, 2005, and August 22, 2006. The 2004, 2005, and 2006 Reevaluations indicate no changes have been made to the noise abatement commitments as stated in the Final EIS and ROD. However, the 2006 Reevaluation indicates the following as a new commitment for Financial Management (FM) Number 242484-5: “Adjust locations of noise walls to outside the mainline due to using remainder parcel that will be acquired for exfiltration system and will become a part of the overall landscaping plan.” The 2005 and 2006 Reevaluations also indicate that “Detailed noise analyses will be conducted to support the need for noise abatement in accordance with the Department’s guidelines.”

It should be noted that three of the 11 noise barriers recommended for further consideration during the PD&E Study along SR 408 (i.e., NSAs 2-I, 2-J, and 2-H) have been constructed as part of a separate project. Therefore, these barriers do not to be reassessed since FDOT’s commitment to construct reasonable and feasible noise abatement at these locations has been met. In addition, FDOT’s commitment to implement reasonable and feasible noise abatement does not include two other NSAs (i.e., 4-I and 4-J) where noise barriers were considered reasonable and feasible in the 2002 Noise Study Report. As described in Section 1.2 below, the noise barriers for NSAs 4-I and 4-J located north of SR 434 and east of I-4 have already been constructed as a part of a separate project. Therefore, these two noise barriers do not warrant reassessment. The locations and limits of the five noise barriers that have already been constructed are shown in Figure 3-1 located at the end of Section 3.0 (see Sheets 23 through 27).

The main purpose of the current noise study is to reassess the remaining eight noise barriers recommended for further consideration during the I-4 PD&E Study based on the Preliminary Design Plans, current land uses, and the latest noise regulations (i.e., 23 CFR 772). The reassessment is
intended: 1) to confirm that these noise barriers are still reasonable and feasible, and 2) to identify the type, location, dimensions, and estimated costs of the recommended noise barriers. In addition, other noise sensitive areas were reassessed for noise barriers where roadway geometry refinements, changes in traffic volumes, or the proposed design changes are likely to change the number of noise impacts or the limits of an existing noise barrier. The other noise sensitive areas that were reassessed for impacts and noise barriers are described in Section 3. The methods and results of the current noise study are summarized in this report. The following sections describe the project and the previous noise studies that have been completed.
1.1 Project Description

1.1.1 Project Background
In November 1989, FDOT completed a Master Plan for improvements to I-4 from the Polk/Osceola County Line to US 17/92 in Seminole County. The original I-4 Master Plan proposed highway improvements through 2010. The Master Plan recommended that the existing roadway be widened by up to 16 lanes with an envelope for transit in the median. In addition, it recommended modifications to several interchanges. The Master Plan was approved by METROPLAN ORLANDO, formerly the Orlando Urban Area Metropolitan Planning Organization (MPO), in November of 1989.

In October 1996, FDOT completed the I-4 Multi-Modal Master Plan (MMMP) for the 73-mile I-4 corridor through Central Florida. The I-4 MMMP limits extended from the Polk/Osceola County Line to Interstate 95 (I-95) in Volusia County. The I-4 MMMP was developed to identify the specific components of the I-4 improvements through 2020.

The I-4 MMMP was performed using a three-tier analysis, in which a broad range of alternatives were evaluated and narrowed. Tier 1 dealt with a broad array of potential investment strategies, including roadway investments outside the I-4 corridor. Nine alternatives were selected for further analysis in Tier 2. Tier 2 was conducted as a Major Investment Study (MIS), in accordance with Federal law. The recommended design concept and scope were adopted by both METROPLAN ORLANDO and the Volusia County MPO. Tier 3 refined the basic Tier 2 design concept and scope into a Master Plan, which adheres to the FDOT Interstate Highway Policy.

In September 1995, METROPLAN ORLANDO and the Volusia County MPO voted to adopt the I-4 MIS design concept and scope. In December 1995, both MPO's approved their respective 2020 Long Range Transportation Plans (LRTP's), which included the recommended I-4 MIS improvements. As a result of the recommendations presented in the I-4 MMMP and MIS, the FDOT elected to go forward with the next phase of the I-4 corridor facility development process through four (4) closely coordinated studies. These studies included three PD&E studies for the I-4 highway sections:

- Section 1 from Osceola/Polk County Line to West of SR 528 in Osceola and Orange Counties: Finding of No Significant Impacts (FONSI);
Section 2 from SR 528 to East of SR 472, in Orange, Seminole and Volusia Counties: Environmental Impact Statement (EIS); and

Section 3 from East of SR 472 to I-95 in Volusia County: Environmental Assessment, Finding of No Significant Impacts (FONSI).

In addition, a Preliminary Engineering (PE) Report and an EIS for the Light Rail Transit (LRT) system was concurrently and independently being developed. The LRT and I-4 studies represent freestanding projects capable of independent operation.

As stated above, the proposed I-4 Ultimate Project is located within the limits of the Section 2 PD&E Study. The initial ROD for limits from West of Kirkman Road to Orange/Seminole County Line in Orange County was executed on December 5, 2002. The ROD for the limits from Orange/ Seminole County Line to East of SR 434 in Seminole County was executed on December 8, 2005. Since the approval of the RODs, the FEIS has been reevaluated to address various design changes which were approved by FHWA on December 20, 2004, April 7, 2005, and August 22, 2006. The System Access Modification Report (SAMR) was originally approved in June 2000 and subsequently updated and approved in 2003. The SAMR for the interchanges inside the project limits was fully reevaluated and approved on January 20, 2011. The Department is in the process of completing a Design Change/Construction Advertisement Reevaluation to address updates to the I-4 Ultimate Project, completion of the Traffic and Revenue Study, and updates to the various Project commitments and environmental documentation.

1.1.2 Project Overview

The construction of the I-4 Ultimate Project will extend from east of Kirkman Road (State Road 435) in Orange County to east of SR 434 in Seminole County. I-4 will be reconstructed to accommodate, in each direction, three general use lanes, auxiliary lanes, and two managed lanes. Access to and from the Managed Lanes will be provided through slip ramps located along the corridor and direct access Managed Lane-only ramps will be at Grand National Drive, South Street, Anderson Street, Ivanhoe Boulevard and Central Parkway interchanges.

The widening of I-4 includes reconstruction of the following interchanges along I-4:
Kirkman Road (SR 435);
Grand National Boulevard;
Florida’s Turnpike (SR 91);
Orange Blossom Trail (SR 600, US 17/92);
Michigan Avenue;
Kaley Street;
East-West Expressway (SR 408);
South Street;
Anderson Street;
Colonial Drive (SR 50);
Ivanhoe Boulevard;
Princeton Street (SR 438);
Fairbanks Avenue (SR 426);
Lee Road (SR 423);
Maitland Boulevard (SR 414);
Semoran Boulevard (SR 436);
Central Parkway; and
SR 434.

The I-4 Ultimate Project will involve replacement of nearly all of the bridges along I-4 within the project’s limits.

The SR 408/I-4 interchange will be built to its ultimate configuration and will include modifications to SR 408, which is operated by Orlando-Orange County Expressway Authority (OOCEA). The improvements to SR 408 will include, but not be limited to, modifications or additions of bridges over:

- Parramore Avenue;
- Westmoreland Avenue;
- Rio Grande Avenue;
- Orange Blossom Trail (SR 600, US 17/92); and
- Tampa Avenue.
The I-4 PD&E Study Reevaluation which was approved by FHWA on April 7, 2005, included a new typical section for I-4, expanded to 12 total lanes to accommodate, in each direction, three general use lanes, auxiliary lanes, and two tolled lanes, through the section of the corridor from west of Kirkman Road (Orange County) to east of SR 434 (Seminole County).

FDOT has completed Reference Design Plans (up to 60% for most roadway portions) on this 21-plus mile corridor. The Reference Design established the I-4 mainline and ramp geometry based on the traffic operational and safety needs for the roadway. The Reference Design also provides the layout of the Managed Lanes, including the start and end transitions from the Managed Lanes to the existing general use lanes and direct connect ramps to specific side streets along the corridor. FDOT has acquired right-of-way and obtained environmental permits based on the roadway layout depicted in the Reference Design. The items below represent modifications from the original design, and will be included in the upcoming Design Change/Construction Advertisement Reevaluation:

- A revised layout for the Kirkman interchange which is currently at 20% - line and grade plan level. FDOT has obtained the environmental resource permit for this change;
- The Grand National Drive interchange with I-4 which is currently at 60% plan level. FDOT has obtained the environmental resource permit for this change;
- Modification of the Light Rail Transit Envelope Reservation from Kirkman Road to John Young Parkway and inclusion of a collector distributor road system from Florida’s Turnpike to Conroy Road is currently undergoing a PD&E Study Reevaluation (there are no design plans associated with this change);
- Revised interchange layout between Florida’s Turnpike and Conroy Road is currently undergoing a PD&E Study Re-evaluation (there are no plans associated with this change); and
- Removal of the pedestrian bridge on SR 436, addition of a pedestrian underpass crossing of SR 436, and sidewalks on the SR 436 bridge over I-4.

The Reference Design was also used to develop the Preliminary Design Plans which incorporate the design changes listed above. The Reference Design consists of six separate design segments each with a separate FM Number. These design segments are referred to as Design Sections 1 through 6 in this report as listed below:
- Design Section 1 - West of Kirkman Road to Orange Blossom Trail FM No. 242484-3;
- Design Section 2 - Orange Blossom Trail to South of Ivanhoe Boulevard FM No. 242484-4;
- Design Section 3 - South of Ivanhoe to North of Kennedy Boulevard FM No. 242484-5;
- Design Section 4 - Kennedy Boulevard to North of Maitland Boulevard FM No. 242484-6;
- Design Section 6 - Orange County Line to ¼ Mile East of Central Parkway FM No. 242592-2; and
- Design Section 6 - ¼ Mile East of Central Parkway to East of SR 434 FM No. 242529-3.
1.2 Previous Noise Studies

Traffic noise studies were performed for each of the three I-4 PD&E Study Sections. The planned I-4 Ultimate Project is located within the limits of the Noise Impact Report for the I-4 PD&E Study Section 2 dated August 2002. The project corridor for Section 2 was divided into six segments and included 51 noise sensitive areas (NSAs), 1-A through 6-F, that were assessed for noise impacts. The 51 NSAs are described in Section 2.3 on pages 12 through 16 and shown in Figure 2.3.1 of the 2002 Noise Impact Report. The relevant pages referenced from the 2002 Noise Impact Report are included in Appendix A. Of the 51 NSAs, 33 (i.e., 1-G through 4-J) are located within the limits of the I-4 Ultimate Project. Twenty three of the 33 NSAs (i.e., 2-B through 4-J) within the I-4 Ultimate Project limits were evaluated to determine the reasonableness and feasibility of noise barriers. The reasonableness and feasibility of noise barriers at these NSAs are summarized in Table 4.4-1 and pages 49 through 53 in Appendix A from Section 3.4 of the 2002 Noise Impact Report. Noise barriers were determined to be reasonable and feasible noise abatement measures at 13 noise sensitive areas (NSAs) including 2-E, 2-F, 2-H, 2-I, 2-J, 3-B, 3-C, 3-D, 3-E, 3-F, 4-C, 4-I, and 4-J. The general locations of the 13 noise barriers are shown in Figure 3.4.1 in Appendix A. Following the completion of the 2002 Noise Study Report, the noise barriers for NSAs 4-I and 4-J located north of SR 434 and east of I-4 were constructed as a part of a separate project. Therefore, these two noise barriers were not identified in the 2005 ROD’s commitments to be implemented as part of the I-4 Ultimate Project.

In addition to the three I-4 PD&E Noise Studies, an earlier noise study was performed as part of the John Young Parkway/I-4 Interchange PD&E Study. The methodology and results are summarized in a Noise Impact Report dated August 1998. Several residential areas are located along I-4 and to the east of John Young Parkway. These residential areas (i.e., Lakeshore Landings Mobile Home Park, Isle of Catalina, and Thirty Third Street Park Subdivision) were predicted to experience design year traffic noise levels that approached or exceeded FHWA’s Noise Abatement Criteria. However, noise barriers were not determined to be reasonable or feasible abatement measures and were not recommended for further consideration. The 2002 Noise Impact Report for the I-4 PD&E Study Design Section 2 did not reassess these residential areas or identify them as specific NSAs. These residential areas are located to the east of NSAs 2-A and 2-B which were identified in the 2002 Noise Impact Report. For the current noise study, the residential areas east of the NSA 2-A were identified as NSA 2-AA and the residential areas east of NSA 2-B were identified as NSA 2-BB.
Following the approval of the RODs, three design phase noise studies were performed to reevaluate the noise barriers that were determined to be reasonable and feasible during the 2002 PD&E Noise Study. The Noise Analysis Reevaluation Technical Memorandum dated February 2006, presented the results of the reevaluation of the noise barriers for the six NSAs (i.e., 2-E through 2-K) located between Orange Blossom Trail and Ivanhoe Boulevard (i.e., Design Section 2). The I-4 Noise Barrier Analysis Technical Memorandum revised November 22, 2005, presented the results of the reevaluation of the noise barriers for the eight NSAs (i.e., 3-A through 3-H) located between Ivanhoe Boulevard and north of Kennedy Boulevard (i.e., Design Section 3). The Design Phase Noise Study Update Report dated July 2009, presented the results of the reevaluation of the noise barrier for NSA 4-C located between the Orange County Line and north of Central Parkway (Design Section 5). The relevant information in these reports has been incorporated into Section 3 of this report as part of the discussion and reevaluation of the NSAs within the project limits. It should be noted that some of the heights of the recommended noise barriers along the outside shoulders of I-4 were greater than 14 feet in these reports. Currently, as described in Section 2.5, the maximum height of noise barriers along the outside shoulder and on embankment is limited to 14 feet per FDOT’s PD&E Manual, Volume 2, Chapter 17, Noise (May 24, 2011) and Plans Preparations Manual, Volume 1, Chapter 32 Noise Barriers (July 1, 2013).

In addition to these three design phase noise study reports, the results of the survey to determine the support for the construction of the noise barriers recommended for NSAs 2-E and 2-F are summarized in the “I-4 Noise Abatement Benefited Receptor Survey Report of Findings” dated August 2006. For both locations, a majority of benefited receptor sites were in favor of the noise barrier construction. The relevant information in that report has been incorporated into Section 3 of this report as part of the discussion and reevaluation of these two NSAs.
2.0 METHODOLOGY

This study was conducted in accordance with FDOT’s PD&E Manual, Volume 2, Chapter 17, Noise (May 24, 2011), FDOT’s Plans Preparations Manual, Volume 1, Chapter 32 Noise Barriers (July 1, 2013), and 23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise (July 13, 2010). The following sections describe the noise metrics, traffic noise model, and the noise abatement criteria used in this noise analysis. Section 2.5 summarizes the methodology used to evaluate the feasibility and reasonableness of noise barriers.

2.1 Noise Metric

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

2.2 Traffic Noise Modeling

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 barriers. The TNM 2.5 predicted noise levels and the other referenced noise levels in this report are dB(A) Leq(h). The TNM 2.5 was used because it is FHWA’s latest approved noise model and the noise model used in the 2002 I-4 Section 2 PD&E Study Noise Impact Report (i.e., STAMINA 2.0) is considered outdated by FHWA. In addition, 23 CFR 772 now requires the use of the latest version of TNM for all Design Change Reevaluations.

TNM 2.5 estimates the acoustic intensity at noise sensitive receptor sites from a series of roadway segments (the source). Model-predicted noise levels are influenced by several factors, such as vehicle speed and distribution of vehicle types. Noise levels are also affected by characteristics of the source-to-receptor site path, including the effects of intervening barriers, houses, trees, and different ground surfaces and topography. The proposed horizontal and vertical roadway geometry and ground elevations used in the TNM were based on the Preliminary Design Plans as well as the design survey used to develop the Reference Design Plans.
Table 2.1 | Sound Levels of Typical Noise Sources and Environments

<table>
<thead>
<tr>
<th>COMMON OUTDOOR ACTIVITIES</th>
<th>NOISE LEVEL dB(A)</th>
<th>COMMON INDOOR ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jet Fly-over at 1000 ft</td>
<td>---110---</td>
<td>Rock Band</td>
</tr>
<tr>
<td>Gas Lawn Mower at 3 ft</td>
<td>---100---</td>
<td></td>
</tr>
<tr>
<td>Diesel Truck at 50 ft, at 50 mph</td>
<td>---90---</td>
<td></td>
</tr>
<tr>
<td>Noise Urban Area (Daytime)</td>
<td>---80---</td>
<td></td>
</tr>
<tr>
<td>Gas Lawn Mower at 100 ft</td>
<td>---70---</td>
<td></td>
</tr>
<tr>
<td>Commercial Area</td>
<td>---60---</td>
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<tr>
<td>Heavy Traffic at 300 ft</td>
<td>---50---</td>
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<tr>
<td>Quiet Urban Daytime</td>
<td>---40---</td>
<td></td>
</tr>
<tr>
<td>Quiet Urban Nighttime</td>
<td>---30---</td>
<td></td>
</tr>
<tr>
<td>Quiet Suburban Nighttime</td>
<td>---20---</td>
<td></td>
</tr>
<tr>
<td>Quiet Rural Nighttime</td>
<td>---10---</td>
<td></td>
</tr>
<tr>
<td>Lowest Threshold of Human Hearing</td>
<td>---0---</td>
<td>Lowest Threshold of Human Hearing</td>
</tr>
</tbody>
</table>


2.3 Traffic Data

The traffic data used in the noise analysis including the peak hour traffic volumes for the future design year conditions were obtained from the I-4 Future Traffic Methodology Memorandum dated March 26, 2013, and the LOS “C” volumes contained in the generalized tables of FDOT’s Level of Service Handbook (December 2012). The traffic volumes used to predict design year noise levels included the least of either: 1) the traffic capacity of the roadway at LOS “C” or 2) the projected traffic demand of the roadway. These traffic volumes can be expected to produce the noisiest traffic conditions likely to occur during the design year.
2.4 Noise Abatement Criteria

The FHWA has established Noise Abatement Criteria (NAC) for seven land use activity categories. The NAC levels are presented in Table 2.2. Noise abatement measures must be considered when predicted noise levels approach or exceed the NAC levels or when a substantial noise increase occurs at a noise sensitive receptor site. A substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 dB(A) or more as a result of the transportation improvement project. The FDOT defines “approach” as within 1.0 dB(A) of the FHWA criteria.

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

The developed areas along the project corridor have been classified by the Noise Abatement Activity Categories and mapped on Figure 3-1 (Sheets 1 through 29, located at the end of Section 3.3). Different colored dots were used with the identifying labels to distinguish between the categories (e.g., yellow dots and text were used for residential and orange for other sensitive land uses). Activity Category F including retail stores and industrial lands and other non-sensitive developed properties were noted by blue dots. Green dots were used for potentially sensitive commercial properties including restaurant, hotels, and office buildings that have exteriors areas of frequent human use. Commercial properties without exterior areas of use including restaurants, hotels, and office buildings do not have a NAC so were also noted with blue dots to denote they represent non-sensitive developed properties.
<table>
<thead>
<tr>
<th>Activity Category</th>
<th>Activity Leq(h)</th>
<th>Evaluation Location</th>
<th>Description of Activity Category</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>FHWA</td>
<td>FDOT</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>57</td>
<td>56</td>
<td>Exterior</td>
</tr>
<tr>
<td>B^2</td>
<td>67</td>
<td>66</td>
<td>Exterior</td>
</tr>
<tr>
<td>C^2</td>
<td>67</td>
<td>66</td>
<td>Exterior</td>
</tr>
<tr>
<td>D</td>
<td>52</td>
<td>51</td>
<td>Interior</td>
</tr>
<tr>
<td>E^2</td>
<td>72</td>
<td>71</td>
<td>Exterior</td>
</tr>
<tr>
<td>F</td>
<td>_</td>
<td>_</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>_</td>
<td>_</td>
<td></td>
</tr>
</tbody>
</table>

(Based on Table 1 of 23 CFR Part 772)

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

2 Includes undeveloped lands permitted for this activity category.

Note: FDOT defines that a substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 decibels or more as a result of the transportation improvement project. When this occurs, the requirement for abatement consideration will be followed.
To facilitate the analysis of traffic noise impacts, representative receptor sites were used. Representative sites were chosen based on noise sensitivity, roadway proximity, anticipated impacts from the proposed project, and homogeneity (i.e., representative of other similar areas in the project study area). For single family residences, traffic noise levels were predicted at the edge of the dwelling closest to the travel lanes as well as patio areas located above ground level. For multi-family residences, traffic noise levels were predicted at the edge of the patio or balcony closest to the travel lanes. For the other non-residential noise sensitive sites that may be impacted, traffic noise levels were predicted where the exterior activity occurs. The first floor receptor sites were modeled 5 feet above ground and the second and third story receptor sites were modeled at 15 and 25 feet above ground level, respectively. For the prediction of interior noise levels, receptor sites were placed 10 feet inside the building at the edge closest to the roadway. The standard building noise reduction factors identified in Table 17.2 of the PD&E Manual, Chapter 17, Noise, and window conditions were used to estimate the noise reduction provided by the exterior of the structure.

2.5 Analysis of Noise Barriers

Per FDOT’s PD&E Manual, Volume 2, Chapter 17, Noise (May 24, 2011), noise abatement measures must be considered reasonable and feasible to be recommended for design and construction. The most common and effective noise abatement measure is the construction of a noise barrier. Noise barriers reduce noise by blocking the sound path between a roadway and a noise sensitive area. To be effective, noise barriers must be long, continuous (i.e., with no intermittent openings), and have sufficient height to block the path between the noise source and the receptor site. FHWA’s Analysis and Abatement Guidance (January 2011) indicates that the ends of the noise barriers should, in general, extend in each direction four times as far as the distance from the receptor site to the barrier. In accordance with 23 CFR Part 772, when traffic noise associated with a proposed project is predicted to approach [i.e., 1 dB(A)] or exceed the NAC at a noise sensitive site, noise abatement in the form of a noise barrier must be considered and evaluated for feasibility and reasonableness.

A wide range of factors is used to evaluate the feasibility and reasonableness of noise abatement measures. Feasibility deals with engineering considerations including the ability to construct a noise barrier using standard construction methods and techniques and with the ability to provide a reduction of at least 5 dB(A) to the impacted receptor sites. For example, given the topography of a particular location, can the minimum noise reduction [i.e., 5 dB(A)] be achieved given certain access, drainage,
utility, safety, or maintenance requirements? In addition, for a noise barrier to be considered acoustically feasible, at least two impacted receptor sites must achieve a 5 dB(A) reduction or greater.

Once a noise abatement measure is determined to be feasible, the reasonableness of noise abatement is evaluated. Reasonableness implies that common sense and good judgment were applied in a decision related to noise abatement. The following three reasonableness factors must be collectively achieved in order for the noise abatement measure to be deemed reasonable: the cost effectiveness of the noise abatement measure, the achievement of the noise reduction design goal, and the consideration of the viewpoints of the benefited property owners and residents.

A noise barrier or other noise abatement measure needs to be cost effective. When determining the cost reasonableness of a conceptual noise barrier design for a residential area, $42,000 per benefited receptor is looked upon as the upper limit using the standard construction cost of $30.00 per square foot. A benefited receptor site is defined as a noise sensitive site that will obtain a minimum of 5.0 dB(A) of noise reduction as a result of a specific noise abatement measure regardless of whether or not they are identified as impacted. Only benefited receptor sites are included in the calculation of reasonable cost of a particular noise abatement measure.

The evaluation of noise barriers for impacted non-residential areas (Activity Categories A, C, D, and E) is based on FDOT’s “A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations (July 22, 2009)”. The cost reasonableness of this method is based on the number of people (i.e., person-hours per day) benefited by a noise barrier under consideration. Using this methodology, to be considered cost reasonable, the cost of the noise barrier must have an Abatement Cost Factor less than $995,935 per person-hour per square foot. The Abatement Cost Factor represents the upper limit of the cost per person-hour per square foot of noise barrier and does not represent any direct relation to real barrier construction costs such as dollar per square foot of a barrier. The derivation of the Abatement Cost Factor is based on FDOT’s reasonable cost criteria of $42,000 per benefited receptor site.

A noise barrier or other noise abatement measure must achieve the established noise reduction design goal. To meet the noise reduction design goal, a noise barrier or abatement measure must benefit at
least two impacted receptor sites and must attain the noise reduction design goal of 7 dB(A) at one or more impacted receptor sites.

During a PD&E Study, the view of benefited receptors regarding noise abatement is gathered during workshops, via the project website, and the Public Hearing. During the design phase of the project, a more detailed process is implemented including noise abatement workshops and/or public survey to determine the wishes of the benefited receptor sites. Each benefited receptor including both the owner and resident is given the opportunity to provide input regarding their desires to have the proposed noise abatement measure constructed. The goal of this process is to obtain a response for or against the noise barrier from a majority of benefited receptors that respond to the survey. If not supported by a majority the benefited receptor sites, a noise barrier or abatement measure will not be deemed reasonable.

To facilitate the barrier analysis, contiguous noise sensitive areas were grouped together into common noise environments. A common noise environment represents a group of impacted receptor sites of the same Activity Category that would benefit from the same noise barrier or barrier system (i.e., overlapping/continuous barriers) that are exposed to similar noise sources and levels, traffic volumes, traffic mix, and speeds, and topographic features. Generally, common noise environments occur between two secondary noise sources, such as interchanges, intersections, and/or cross-roads. In addition, the primary method for determining the cost of noise abatement involves a review of the cost per benefited receptor site for the construction of a noise barrier benefiting a single location or common noise environment (e.g., a subdivision or contiguous impact area). For consistency, the NSAs used in the previous I-4 noise studies were used to represent the common noise environments where noise barriers were evaluated.

For this project, both ground mounted and shoulder mounted barriers were evaluated to determine their effectiveness in providing noise abatement to the impacted noise sensitive sites. Ground mounted barriers, which are also referred to as concrete post-and-panel noise walls, are usually constructed in the vicinity of the right-of-way line. Shoulder barriers are constructed along the outside edge of the roadway shoulder. Typically, shoulder mounted noise barriers are used on elevated roadway sections because ground mounted noise barriers are often less effective in these areas. To effectively reduce traffic noise, ground mounted noise barrier heights range from 14 to 22 feet and shoulder mounted
noise barriers typically range from 8 to 14 feet in height. Due to safety and constructability issues, the maximum height of shoulder mounted barriers is limited to 14 feet except on structures such as bridges and retaining walls or mechanically stabilized earth (MSE) walls, where they are limited to 8 feet unless specifically approved by the State Structures Design Engineer. Only the barrier heights that were effective in maximizing noise reduction were analyzed and presented in the noise barrier summary tables. For this project, the standard construction cost of $30.00 per square foot was used for assessing the cost reasonableness of noise barriers.
3.0 Noise Impact and Noise Barrier Reassessment

This section summarizes the results of the reassessment of noise barriers that were recommended for further consideration during the 2002 I-4 PD&E Study and at the other NSAs within the project limits. Table 3.1 lists the 33 NSAs within the project limits as identified in the 2002 PD&E Noise Impact Report and the two NSAs from the 1998 Noise Impact Report for the John Young Parkway/I-4 PD&E Study. The general limits of these NSAs are also shown in Figure 3-1. Table 3.1 also identifies the NSAs that were reassessed as well as those that were not for various reasons which are described in the comments. Section 3.1 summarizes the status and/or reassessment of the 11 noise barriers considered feasible and reasonable and committed to further consideration in the FEIS and the two RODs including: 2-E, 2-F, 2-H, 2-I, 2-J, 3-B, 3-C, 3-D, 3-E, 3-F, and 4-C. Section 3.2 summarizes the reassessment of eight other noise sensitive areas where design changes potentially would affect predicted design year noise levels or the effectiveness of noise barriers including: 2-AA, 2-BB, 2-B, 3-G, 3-H, 4-D, 4-G, and 4-I.

As described in Section 2.5, determining the feasibility and reasonableness of noise barriers at specified locations includes several steps. For areas where barriers are considered feasible (i.e., without site constraints), further analysis is conducted to determine if they meet FDOT’s reasonableness criteria. Further analysis includes developing various conceptual barrier designs to determine the most effective location with an optimum length and height to achieve the desirable noise reduction while minimizing cost. Initially, an assessment is conducted to determine if FDOT’s noise reduction design goal can be met. To meet FDOT’s noise reduction design goal, a noise barrier must benefit at least two impacted receptor sites and must attain FDOT’s noise reduction design goal of 7.0 dB(A) at one or more impacted receptor sites. To be considered cost reasonable, the cost of providing abatement must be less than FDOT’s criteria of $42,000 per benefited residential receptor site.

Separate report sections were used to facilitate the review of noise barriers for each of the noise sensitive areas. These sections include:

- A brief description of the noise sensitive area(s)/site(s) and the general location;
- The types and locations of noise barriers considered;
- A summary of the noise barrier analysis and a description of the most feasible conceptual designs for each location including any recommendations; and
- Tables that summarize the results of the barrier analysis. Tables include the type and dimensions of the barrier designs considered, their effectiveness, their costs, and the number of impacted and benefitted receptors.

The locations of the noise barriers evaluated and are shown in Figure 3-2 located at the end of Section 3.
BEGIN PROJECT

I-4 ULTIMATE PROJECT
FROM EAST OF KIRKMAN ROAD TO EAST OF SR 434
ORANGE AND SEMINOLE COUNTIES, FLORIDA
FPID: 432193-1-52-01

Legend
- Noise Sensitive Areas

FIGURE 3-1
NOISE SENSITIVE AREAS MAP

Sheet 1 of 2
<table>
<thead>
<tr>
<th>Noise Sensitive Sites</th>
<th>General Location (Cross Streets)</th>
<th>Section Number</th>
<th>Direction</th>
<th>Number of Impacted Sites</th>
<th>Number of Benefited Sites</th>
<th>Noise Barriers Considered Feasible and Reasonable?</th>
<th>Comments</th>
<th>Affected by Design Changes at Land Use Changes?</th>
<th>Noise Impacts and Noise Barriers Reassessed?</th>
<th>Noise Abatement Criteria Activity Category</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-G</td>
<td>East of Sand Lake Boulevard</td>
<td>1</td>
<td>East</td>
<td>3</td>
<td>---</td>
<td>No Due to secondary traffic noise sources, the 5 dB(A) minimum insertion loss requirement not met</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>E</td>
</tr>
<tr>
<td>1-H</td>
<td>West of Florida's Turnpike</td>
<td>1</td>
<td>West</td>
<td>0</td>
<td>---</td>
<td>No noise sensitive sites identified as impacted</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>E</td>
</tr>
<tr>
<td>1-I</td>
<td>Florida's Turnpike and Conroy Blvd</td>
<td>1</td>
<td>West</td>
<td>64</td>
<td>---</td>
<td>No Due to secondary traffic noise sources, the 5 dB(A) minimum insertion loss requirement not met</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>B</td>
</tr>
<tr>
<td>1-J</td>
<td>Florida's Turnpike and Conroy Blvd</td>
<td>1</td>
<td>West</td>
<td>115</td>
<td>---</td>
<td>No Due to secondary traffic noise sources, the 5 dB(A) minimum insertion loss requirement not met</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>B</td>
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<tr>
<td>2AA</td>
<td>John Young Parkway to Rio Grande Avenue</td>
<td>1</td>
<td>South</td>
<td>36</td>
<td>25</td>
<td>No Noise barriers were not cost reasonable</td>
<td>Yes</td>
<td>Yes</td>
<td>---</td>
<td>---</td>
<td>B</td>
</tr>
<tr>
<td>2BB</td>
<td>John Young Parkway to Rio Grande Avenue</td>
<td>1</td>
<td>North</td>
<td>25</td>
<td>14</td>
<td>No Noise barriers were not cost reasonable</td>
<td>Yes</td>
<td>Yes</td>
<td>---</td>
<td>---</td>
<td>B</td>
</tr>
<tr>
<td>2-A</td>
<td>West of Rio Grande Avenue to Orange Blossom Trail</td>
<td>2</td>
<td>East</td>
<td>114</td>
<td>---</td>
<td>No Due to secondary traffic noise sources, the 5 dB(A) minimum insertion loss requirement not met</td>
<td>Yes</td>
<td>Yes</td>
<td>---</td>
<td>---</td>
<td>B</td>
</tr>
<tr>
<td>2-B</td>
<td>West of Rio Grande Avenue to Orange Blossom Trail</td>
<td>2</td>
<td>West</td>
<td>46</td>
<td>7</td>
<td>No Noise barriers were not cost reasonable</td>
<td>Yes</td>
<td>Yes</td>
<td>---</td>
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<td>B</td>
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<tr>
<td>2-C</td>
<td>Woods Ave to Killarney Street</td>
<td>2</td>
<td>West</td>
<td>45</td>
<td>25</td>
<td>No Noise barriers were not cost reasonable</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>B</td>
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<tr>
<td>2-D</td>
<td>Orange Blossom Trail to East of Michigan St W</td>
<td>2</td>
<td>East</td>
<td>33</td>
<td>13</td>
<td>No Noise barriers were not cost reasonable</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>2-E</td>
<td>Gore Street to SR 408</td>
<td>2</td>
<td>West</td>
<td>157</td>
<td>150</td>
<td>Yes Noise barriers were cost reasonable and feasible</td>
<td>No</td>
<td>No (see Comment)</td>
<td>B Noise barrier limits identified in the Reference Design Plane Section 2; Recommended for further consideration and public input</td>
<td>---</td>
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<tr>
<td>2-F</td>
<td>Killarney Street to Patriots Street</td>
<td>2</td>
<td>West</td>
<td>56</td>
<td>47</td>
<td>Yes Noise barriers were cost reasonable and feasible</td>
<td>Yes</td>
<td>Yes</td>
<td>---</td>
<td>---</td>
<td>B</td>
</tr>
<tr>
<td>2-G</td>
<td>Orange Blossom Trail to Gore Street</td>
<td>2</td>
<td>West</td>
<td>146</td>
<td>16</td>
<td>No Noise barriers were not cost reasonable</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>B</td>
</tr>
<tr>
<td>2-H</td>
<td>Orange Blossom Trail to Parramore Ave</td>
<td>2</td>
<td>West</td>
<td>82</td>
<td>38</td>
<td>Yes Noise barriers were cost reasonable and feasible</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>2-I</td>
<td>Delray Ave to Millis Ave</td>
<td>2</td>
<td>East</td>
<td>60</td>
<td>47</td>
<td>Yes Noise barriers were cost reasonable and feasible</td>
<td>Yes</td>
<td>No (see Comment)</td>
<td>B Noise barriers considered reasonable and feasible at this location in the 2002 Noise Study Report; An 8-foot tall noise barrier was constructed as part of the SR 408 Project</td>
<td>---</td>
<td>B</td>
</tr>
<tr>
<td>2-J</td>
<td>South Orange Ave to Forest Ave</td>
<td>2</td>
<td>East</td>
<td>66</td>
<td>132</td>
<td>Yes Noise barriers were cost reasonable and feasible</td>
<td>No</td>
<td>No (see Comment)</td>
<td>B Noise barriers considered reasonable and feasible at this location in the 2002 Noise Study Report; An 8-foot tall noise barrier was constructed as part of the SR 408 Project</td>
<td>---</td>
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<tr>
<td>2-K</td>
<td>SR 408 to Washington Street (West)</td>
<td>2</td>
<td>West</td>
<td>61</td>
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<td>No Due to secondary traffic noise sources, the 5 dB(A) minimum insertion loss requirement not met</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>B</td>
</tr>
<tr>
<td>3-A</td>
<td>South of Colonial Drive to North of Ivanhoe Blvd</td>
<td>2</td>
<td>West</td>
<td>2</td>
<td>---</td>
<td>No Due to secondary traffic noise sources, the 5 dB(A) minimum insertion loss requirement not met</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>B</td>
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<tr>
<td>3-B</td>
<td>Ivanhoe Blvd to Princeton Street</td>
<td>3</td>
<td>West</td>
<td>56</td>
<td>52</td>
<td>Yes Noise barriers were cost reasonable and feasible</td>
<td>Yes</td>
<td>Yes</td>
<td>---</td>
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<tr>
<td>3-C</td>
<td>Princeton Street to Par Street</td>
<td>3</td>
<td>West</td>
<td>80</td>
<td>63</td>
<td>Yes Noise barriers were cost reasonable and feasible</td>
<td>Yes</td>
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<td>---</td>
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<tr>
<td>3-D</td>
<td>Ivanhoe Blvd to Hazel Street East</td>
<td>3</td>
<td>East</td>
<td>101</td>
<td>149</td>
<td>Yes Noise barriers were cost reasonable and feasible</td>
<td>Yes</td>
<td>Yes</td>
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</table>
### Table 3.1 Noise Sensitive Areas and Areas Considered for Noise Barriers (Sheet 2 of 2)

<table>
<thead>
<tr>
<th>Noise Sensitive Sites</th>
<th>General Location (Cross Streets)</th>
<th>Referenced Design Plans Section Number</th>
<th>Direction from I-4</th>
<th>Number of Impacted Sites</th>
<th>Number of Benefited Sites</th>
<th>Noise Barriers Considered Feasible and Reasonable?</th>
<th>Affected by Design Changes or Land Use Changes?</th>
<th>Noise Impacts and Noise Barriers Reassessed? *</th>
<th>Noise Abatement Criteria Activity Category</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>3-E</td>
<td>Par Street to West Fairbanks Ave</td>
<td>3 West 60 37</td>
<td>Yes</td>
<td>Noise barriers were cost reasonable and feasible</td>
<td>Yes</td>
<td>Yes</td>
<td>B</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-F</td>
<td>Bay Run Street to West Fairbanks Ave</td>
<td>3 East 64 46</td>
<td>Yes</td>
<td>Noise barriers were cost reasonable and feasible</td>
<td>Yes</td>
<td>Yes</td>
<td>B</td>
<td>---</td>
<td></td>
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</tr>
<tr>
<td>3-G</td>
<td>West Fairbanks Ave to Lee Road</td>
<td>3 West 31 38</td>
<td>No</td>
<td>Noise barriers were not cost reasonable</td>
<td>Yes</td>
<td>Yes</td>
<td>B</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-H</td>
<td>West Fairbanks Ave to Lee Road</td>
<td>3 East 27 26</td>
<td>No</td>
<td>Noise barriers were not cost reasonable</td>
<td>Yes</td>
<td>Yes</td>
<td>B</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-A</td>
<td>Kennedy Blvd to Lucien Way</td>
<td>4 West 3 3</td>
<td>No</td>
<td>Noise barriers were not cost reasonable</td>
<td>No</td>
<td>No</td>
<td>B</td>
<td>Unlikely to meet FDOT's Reasonable Cost Criteria due to low numbers of benefited sites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-B</td>
<td>Kennedy Blvd to Sandspur Road</td>
<td>4 East 24 ---</td>
<td>No</td>
<td>Due to secondary traffic noise sources, the 5 dB(A) minimum insertion loss requirement not met</td>
<td>No</td>
<td>No</td>
<td>B</td>
<td>In this area, Wymore Road versus I-4 is the dominant noise source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-C</td>
<td>Orange Road to SR 436 (Samson Blvd)</td>
<td>6 West 736 143</td>
<td>Yes</td>
<td>Noise barriers were cost reasonable and feasible</td>
<td>Yes</td>
<td>Yes</td>
<td>B</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-D</td>
<td>Mallard Blvd to Oyster Bay Circle</td>
<td>4 East 85 16</td>
<td>No</td>
<td>Noise barriers were not cost reasonable</td>
<td>No</td>
<td>No</td>
<td>B</td>
<td>Unlikely to meet FDOT's Reasonable Cost Criteria due to low numbers of benefited sites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-E</td>
<td>SR 436 (Samson Blvd) to East Central Parkway</td>
<td>6 West 0 ---</td>
<td>No</td>
<td>No noise sensitive sites identified as impacted</td>
<td>No</td>
<td>No</td>
<td>B</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-F</td>
<td>West Central Parkway to SR 434</td>
<td>6 West 41 ---</td>
<td>No</td>
<td>Due to secondary traffic noise sources, the 5 dB(A) minimum insertion loss requirement not met</td>
<td>No</td>
<td>No</td>
<td>B</td>
<td>In this area, Douglas Avenue versus I-4 is the dominant noise source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-G</td>
<td>Central Ave to Beutler Circle</td>
<td>6 East 48 73</td>
<td>No</td>
<td>Noise barriers were not cost reasonable</td>
<td>Yes</td>
<td>Yes</td>
<td>B</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-H</td>
<td>SR 434 to Williamson Road</td>
<td>6 West 50 6</td>
<td>No</td>
<td>Noise barriers were not cost reasonable</td>
<td>No</td>
<td>No</td>
<td>B</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-I</td>
<td>SR-434 to Wooden Shoe Lane</td>
<td>6 East 207 264</td>
<td>Yes</td>
<td>Noise barriers were cost reasonable and feasible</td>
<td>Yes</td>
<td>Yes</td>
<td>B</td>
<td>60 feet of existing 18-foot-tall ground mounted noise barrier replaced with 14-foot-tall shoulder mounted barrier; Benefits all 12 impacted residences; Recommended for further consideration and public input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-J</td>
<td>Wooden Shoe Lane to Williamson Road</td>
<td>6 East 30 36</td>
<td>Yes</td>
<td>Noise barriers were cost reasonable and feasible</td>
<td>---</td>
<td>No (see Comment)</td>
<td>B</td>
<td>Noise Barriers constructed as part of a separate project</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Note: The noise sensitive areas reassessed for noise impacts and noise barriers can be found in Sections 3.1 and 3.2.
3.1 2002 PD&E Study Recommended Noise Barriers

3.1.1 Noise Sensitive Area 2-E

Noise Sensitive Area 2-E encompasses the multi-family residences located west of I-4 and south of SR 408 (see Figures 3-1 and 3-2, Sheet 10 of 29). This residential area includes an apartment complex (i.e., Griffin Park Apartments) that is owned by the City of Orlando Housing Authority based on the Orange County Property Appraiser Website. Noise barriers were considered reasonable and feasible at this location as identified in the 2002 PD&E Noise Impact Report, the 2002 ROD, and in the I-4 Noise Analysis Reevaluation Technical Memorandum dated February 2006. The limits of the recommended noise barrier were also included in the Section 2 (50%) Referenced Design Plans dated March 30, 2012. The information available from these reports and design plans regarding the location, dimensions, effectiveness, and cost of the previously recommended noise barriers are summarized in Table 3.2.

A survey of the benefited receptor sites in this area was previously performed to determine the support for the noise barrier recommended in the I-4 Noise Analysis Reevaluation Technical Memorandum dated February 2006. The results of this survey are presented in the “I-4 Noise Abatement Benefited Receptor Survey Report of Findings” dated August 2006. This report indicates that “The location of NSA-2E included only one property owner, the Orlando Housing Authority, who operates the Griffin Park Apartments. Their Executive Director, Ms. Vivian Bryant, is in favor of the wall”.

A review of the I-4 Noise Analysis Reevaluation Technical Memorandum dated February 2006 indicates that TNM 2.5 was used to reevaluate this area as part of the earlier I-4/SR 408 Interchange Design phase. Since a design noise study and the property owner surveys have been completed, reassessment of the feasibility and reasonableness of noise barriers at this location was not considered warranted. In addition, the Preliminary Design Plans and the 50% Reference Design Plans for Section 2 have similar horizontal and vertical roadway geometry in this area. Therefore, the previously recommended noise barrier for this location remains valid and is recommended for further consideration. Prior to the design and construction of the noise barrier at this location, additional coordination will be performed with the City of Orlando to confirm their support for the recommended noise barrier.

The recommended noise barrier represents an 8-foot and 14-foot-tall and 2,700-foot-long noise barrier located along the outside shoulder of the I-4 westbound lanes and the westbound on ramp from SR 408 from Station 120+70 (I-4) to 5535+76 (SR 408) (see Figure 3-2, Sheet 10 of 29). Due to site conditions at this location, 8-foot and 14-foot-tall shoulder mounted noise barriers were considered the only viable
option. The proposed I-4 travel lanes and ramps will be at least 20 feet higher than the adjacent ground elevations in the vicinity of these apartments. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.
3.1.2 Noise Sensitive Area 2-F

Noise Sensitive Area 2-F encompasses the single family residences located west of I-4 and between Kayley Avenue and Gore Street (see Figures 3-1 and 3-2, Sheets 9 and 10 of 29). This residential area includes a number of subdivisions including Westwood Gardens, Grandview, Angebilt Addition, Oakwood Park, and Lucerne Park based on the Orange County Property Appraiser Website. Noise barriers were considered reasonable and feasible at this location as identified in the 2002 PD&E Noise Impact Report, the 2002 ROD, and in the I-4 Noise Analysis Reevaluation Technical Memorandum dated February 2006. The information available from these reports regarding the location, dimensions, effectiveness, and cost of the previously recommended noise barriers is summarized at the bottom of Table 3.3.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously recommended. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e., 1 dB(A)] or exceed the NAC of 67 dB(A).

Due to site conditions at this location, a combination of ground mounted and shoulder mounted barriers were evaluated. Shoulder mounted noise barriers were considered the only viable option along the elevated segments of I-4 north of Kayley Avenue and areas with insufficient right-of-way for the construction of ground mounted noise barriers. The proposed I-4 travel lanes will be at least 20 feet higher than the adjacent ground elevations in the vicinity of the Kayley Avenue overpass. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet. Ground mounted noise barriers were limited to areas with sufficient right-of-way for their construction. Gore Street limits the length of noise barriers long the I-4 western right-of-way line. South of Gore Street, on either side of the proposed I-4 westbound on ramp, two stormwater ponds are proposed which will affect the propagation of sound waves and the effectiveness of noise barriers for the adjacent residences.

The results of the reassessment of noise barriers for this location are summarized in Table 3.3 (located at the end of Section 3.2.8). Six conceptual barrier designs were evaluated to reduce traffic noise levels
at the 41 residences predicted to be impacted by design year traffic noise. All of the conceptual barrier designs considered except for CD1-2F (i.e., an 8-foot-tall shoulder mounted barrier and a 16-foot-tall ground mounted noise barrier) met the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. Of these alternative barrier designs, CD3-2F is considered the most feasible. CD3-2F represents a combination shoulder mounted noise barrier (14 feet tall and 3,050 feet long) located along the outside shoulder of I-4 westbound lanes from Station 84+00 to 114+50 and a ground mounted noise barrier (16 feet tall and 960 feet long) located approximately 5 feet inside the right-of-way line from Station 113+40 to 119+80 (see Figure 3-2, Sheets 9 and 10 of 29). CD3-2F provides benefit to 71 residences, an average noise reduction of 6.8 dB(A) at benefited receptor sites with a maximum reduction of 12.8 dB(A), and has a cost per benefited residence of $24,532 with an estimated construction cost of $1,741,800. In comparison to the previously recommended conceptual noise barrier designs, CD3-2F extends the 14-foot-tall shoulder mounted noise barrier an additional 1,200 feet to the south (i.e., Station 96+00 to Station 84+00) and the height of the ground mounted noise barrier was increased by 2 feet from 14 feet to 16 feet. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.

In summary, noise barriers are still considered reasonable and feasible at this location. Noise barriers, specifically Conceptual Barrier Design CD3-2F, are recommended for further consideration for design and construction and public input. Conceptual Barrier Design CD3-2F is acoustically feasible and meets FDOT’s cost reasonableness criteria as well as the 7 dB(A) noise reduction design goal. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities.

The viewpoints of the benefited receptor sites are currently unknown but will be determined prior to the design and construction of the noise barrier at this location. A survey of the benefited receptor sites in this area was previously performed to determine their support for a noise barrier. The results of this survey are presented in the “I-4 Noise Abatement Benefited Receptor Survey Report of Findings” dated August 2006. Of the 61 percent of those property owners responding, 97.6 percent were in favor of the construction of a noise barrier.
3.1.3 Noise Sensitive Areas 2-H, 2-I, and 2-J

Noise Sensitive Areas 2-H, 2-I, and 2-J encompass the residential areas located east and west of I-4 along SR 408 (see Figures 3-1 and 3-2, Sheets 10, 26, and 27 of 29). Noise barriers were considered reasonable and feasible at these locations as identified in the 2002 PD&E Noise Impact Report and the 2002 ROD. The information available from the 2002 PD&E Noise Impact Report regarding the location, dimensions, effectiveness, and cost of the previously recommended noise barriers is summarized in Table 3.4. As described below, the noise barriers considered reasonable and feasible in the 2002 Noise Study Report for NSAs 2-H, 2-I, and 2-J have already been constructed as part of the SR 408 Project improvements by Orlando-Orange County Expressway Authority (OOCEA).

The I-4 Noise Analysis Reevaluation Technical Memorandum dated February 2006 indicated that the OOCEA began construction of the proposed improvements analyzed as part of the I-4 PD&E Study Section 2 and completed construction of mainline improvements to SR 408 west of I-4 in 2005. As part of the proposed improvements, noise barriers were constructed for NSAs 2-I, 2-J, and a portion of 2-H between I-4 and Tampa Road. The 2006 Technical Memorandum indicates that FDOT will: 1) replace, in kind, any existing noise barriers that will be impacted during the construction of the I-4 Ultimate Project, and 2) will construct an additional 8-foot-tall shoulder mounted noise barrier along the proposed ramp from I-4 to SR 408 for the eastern end of NSA 2-H.

A review of the Preliminary Design Plans confirms that the existing noise barrier for NSA 2-H will have to be removed and replaced for the construction of the new westbound ramps from I-4 to SR 408. The Preliminary Design Plans and the 50% Reference Design Plans for Section 2 have similar horizontal and vertical roadway geometry in this area. Therefore, the previously recommended replacement noise barrier for NSA 2-H remains valid and is recommended for further consideration and public input. The recommended replacement noise barriers include two 8-foot-tall shoulder mounted barriers along the outside shoulders of the I-4 westbound ramps to westbound SR 408 (see Table 3.4 and Figure 3-2, Sheet 10 of 29). Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.
3.1.4 Noise Sensitive Area 3-B

Noise Sensitive Area 3-B encompasses the single family residences located west of I-4 and south of Princeton Street (see Figures 3-1 and 3-2, Sheets 12 and 13 of 29). This residential area includes several subdivisions including Shore Crest, Bentwood, and Rosemere based on the Orange County Property Appraiser Website. Noise barriers were considered reasonable and feasible at this location as identified in the 2002 PD&E Noise Impact Report, the 2002 ROD, and in the I-4 Noise Barrier Analysis Technical Memorandum revised November 22, 2005. The information available from these reports regarding the location, dimensions, effectiveness, and cost of the previously recommended noise barriers is summarized at the bottom of Table 3.5.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously recommended. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e, 1 dB(A)] or exceed the NAC of 67 dB(A).

Due to site conditions at this location, a combination of ground mounted and shoulder mounted barriers were evaluated. Eight-foot and 14-foot-tall shoulder mounted noise barriers were considered the only viable option along the elevated segments of I-4 south of Princeton Street and areas with insufficient right-of-way for the construction of ground mounted noise barriers. The proposed I-4 travel lanes will be at least 20 feet higher than the adjacent ground elevations in the vicinity of the Princeton Street overpass. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet. Ground mounted noise barriers were limited to areas with sufficient right-of-way for their construction. Princeton Street limits the length of noise barriers along the I-4 western right-of-way line.

The results of the reassessment of noise barriers for this location are summarized in Table 3.5 (located at the end of Section 3.2.8). Six conceptual barrier designs were evaluated to reduce traffic noise levels at the 84 residences predicted to be impacted by design year traffic noise. All of the conceptual barrier designs considered met the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. Of these alternative barrier designs, CD4-3B is considered the most feasible. CD4-3B represents a
A combination of two shoulder mounted noise barriers: 1) an 8-foot and 14-foot-tall and 3,000-foot-long noise barrier located along the outside shoulder of the I-4 westbound lanes and the I-4 westbound on ramp from Princeton Street from Stations 245+00 to 275+00, and 2) an 8-foot-tall and 900-foot-long noise barrier located along the outside shoulder of the I-4 westbound lanes on the Princeton Street overpass from Station 270+00 to 279+00 (see Figure 3-2, Sheets 12 and 13 of 29). CD4-3B provides benefit to 103 residences, an average noise reduction of 7.7 dB(A) at benefited receptor sites with a maximum reduction of 11.3 dB(A), and has a cost per benefited residence of $13,718 with an estimated construction cost of $1,413,000. In comparison to the previously recommended conceptual noise barrier designs, CD4-3B has similar limits but uses a maximum shoulder barrier height of 14 feet versus 16 feet. For safety, 14 feet is currently the maximum height for noise barriers along the roadway shoulder. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.

In summary, noise barriers are still considered reasonable and feasible at this location. Noise barriers, specifically Conceptual Barrier Design CD4-3B, are recommended for further consideration for design and construction and public input. Conceptual Barrier Design CD4-3B is acoustically feasible and meets FDOT’s cost reasonableness criteria as well as the 7 dB(A) noise reduction design goal. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities.

The viewpoints of the benefited receptor sites are currently unknown but will be determined prior to the design and construction of the noise barrier at this location. No prior surveys of the benefited receptor sites in this area have been performed to determine their support for a noise barrier.
### 3.1.5 Noise Sensitive Area 3-C

Noise Sensitive Area 3-C encompasses the single and multi-family residences located west of I-4 between Princeton Street and Par Street (see Figures 3-1 and 3-2, Sheets 13 and 14 of 29). This residential area includes several subdivisions including Hillcrest Heights, Ivanhoe Terrace, and Piney Woods and an apartment complex (i.e., Bay Run) based on the Orange County Property Appraiser Website. Noise barriers were considered reasonable and feasible at this location as identified in the 2002 PD&E Noise Impact Report, the 2002 ROD, and in the I-4 Noise Barrier Analysis Technical Memorandum revised November 22, 2005. The information available from these reports regarding the location, dimensions, effectiveness, and cost of the previously recommended noise barriers is summarized at the bottom of Table 3.6.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously recommended. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e., 1 dB(A)] or exceed the NAC of 67 dB(A).

Due to site conditions at this location, shoulder mounted noise barriers were considered the only viable option. The proposed I-4 travel lanes will be at least 20 feet higher than the adjacent ground elevations in the vicinity of the Princeton Street overpass. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures. In addition, this segment of I-4 does not have sufficient right-of-way for the construction of ground mounted noise barriers. Princeton Street and Par Street both limit the length of noise barriers along the I-4 western right-of-way line.

The results of the reassessment of noise barriers for this location are summarized in Table 3.6 (located at the end of Section 3.2.8). Seven conceptual barrier designs were evaluated to reduce traffic noise levels at the 74 residences predicted to be impacted by design year traffic noise. All of the conceptual barrier designs considered met the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. Of these alternative barrier designs, CD5-3C is considered the most feasible. CD5-3C represents a
combination of two shoulder mounted noise barriers: 1) an 8-foot and 14-foot-tall and 3,740-foot-long noise barrier located along the outside shoulder of the I-4 westbound lanes and the I-4 westbound off ramp to Princeton Street and the on ramp from Par Street from Stations 278+50 to 315+40, and 2) an 8-foot-tall and 520-foot-long noise barrier located along the outside shoulder of the I-4 westbound lanes on the Princeton Street overpass from Station 279+00 to 284+20 (see Figure 3-2, Sheets 13 and 14 of 29). CD5-3C provides benefit to 121 residences, an average noise reduction of 7.7 dB(A) at benefited receptor sites with a maximum reduction of 13.5 dB(A), and has a cost per benefited residence of $13,828 with an estimated construction cost of $1,673,160. In comparison to the previously recommended conceptual noise barrier designs, CD5-3C has similar limits but uses a maximum shoulder barrier height of 14 feet versus 16 feet. For safety, 14 feet is currently the maximum height for noise barriers along the roadway shoulder. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.

In summary, noise barriers are still considered reasonable and feasible at this location. Noise barriers, specifically Conceptual Barrier Design CD5-3C, are recommended for further consideration for design and construction and public input. Conceptual Barrier Design CD5-3C is acoustically feasible and meets FDOT's cost reasonableness criteria as well as the 7 dB(A) noise reduction design goal. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities.

The viewpoints of the benefited receptor sites are currently unknown but will be determined prior to the design and construction of the noise barrier at this location. No prior surveys of the benefited receptor sites in this area have been performed to determine their support for a noise barrier.
3.1.6 Noise Sensitive Area 3-D

Noise Sensitive Area 3-D encompasses the single family and multi-family residences located east of I-4 and south of Princeton Street (see Figures 3-1 and 3-2, Sheet 13 of 29). This residential area includes the Rosemere subdivision and an apartment complex (i.e., Lake Ivanhoe Shores) based on the Orange County Property Appraiser Website. Noise barriers were considered reasonable and feasible at this location as identified in the 2002 PD&E Noise Impact Report, the 2002 ROD, and in the I-4 Noise Barrier Analysis Technical Memorandum revised November 22, 2005. The information available from these reports regarding the location, dimensions, effectiveness, and cost of the previously recommended noise barriers is summarized at the bottom of Table 3.7.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously recommended. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e, 1 dB(A)] or exceed the NAC of 67 dB(A).

Due to site conditions at this location, a combination of ground mounted and shoulder mounted barriers were evaluated. Only 8-foot-tall shoulder mounted noise barriers were considered along the elevated segments of I-4 south of Princeton Street. The proposed I-4 travel lanes will be at least 20 feet higher than the adjacent ground elevations in the vicinity of the Princeton Street and New Hampshire Street overpasses. A 14-foot-tall shoulder mounted noise barrier was not considered due to the bridge structure at the New Hampshire Street overpass which limits the height to 8 feet in this area. Ground mounted noise barriers were limited to areas with sufficient right-of-way for their construction and the non-elevated segments of I-4. Princeton Street limits the length of noise barriers along the I-4 eastern right-of-way line.

The results of the reassessment of noise barriers for this location are summarized in Table 3.7 (located at the end of Section 3.2.8). Four conceptual barrier designs were evaluated to reduce traffic noise levels at the 22 residences predicted to be impacted by design year traffic noise. Neither of the 8-foot-tall shoulder mounted barrier alternatives (CD1-3D and CD2-3D) provided the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. Therefore, two combination
ground mounted barrier and shoulder mounted barrier alternatives were evaluated (CD3-3D and CD4-3D). Of these alternative barrier designs, CD3-3D is considered the most feasible. CD3-3D represents a combination shoulder mounted noise barrier (8 feet tall and 1,500 feet long) located along the outside shoulder of I-4 eastbound lanes from Station 257+00 to 272+00 and a ground mounted noise barrier (16 feet tall and 485 feet long) located approximately 5 feet inside the right-of-way line from Station 270+55 to 275+40 (see Figure 3-2, Sheet 13 of 29). CD3-3D provides benefit to 30 residences, an average noise reduction of 6.2 dB(A) at benefited receptor sites with a maximum reduction of 7.5 dB(A), and has a cost per benefited residence of $19,760 with an estimated construction cost of $592,800. In comparison to the previously recommended conceptual noise barrier designs, CD3-3D has similar barrier heights and limits. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.

In summary, noise barriers are still considered reasonable and feasible at this location. Noise barriers, specifically Conceptual Barrier Design CD3-3D, are recommended for further consideration for design and construction and public input. Conceptual Barrier Design CD3-3D is acoustically feasible and meets FDOT’s cost reasonableness criteria as well as the 7 dB(A) noise reduction design goal. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities. The viewpoints of the benefited receptor sites are currently unknown but will be determined prior to the design and construction of the noise barrier at this location. No prior surveys of the benefited receptor sites in this area have been performed to determine their support for a noise barrier.
3.1.7 Noise Sensitive Area 3-E

Noise Sensitive Area 3-E encompasses the single family residences located west of I-4 between Par Street and Fairbanks Avenue (see Figures 3-1 and 3-2, Sheets 14 and 15 of 29). This residential area includes several subdivisions including Pinewood, Stanbury Estates, Pines, Golfview, Olympia Heights, and Dubsdread Heights based on the Orange County Property Appraiser Website. Noise barriers were considered reasonable and feasible at this location as identified in the 2002 PD&E Noise Impact Report, the 2002 ROD, and in the I-4 Noise Barrier Analysis Technical Memorandum revised November 22, 2005. The information available from these reports regarding the location, dimensions, effectiveness, and cost of the previously recommended noise barriers are summarized at the bottom of Table 3.8.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously recommended. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e., 1 dB(A)] or exceed the NAC of 67 dB(A).

Due to site conditions at this location, shoulder mounted noise barriers were considered the only viable option. The proposed I-4 travel lanes will be at least 20 feet higher than the adjacent ground elevations in the vicinity of the Par Street, Minnesota Avenue, and Fairbanks Avenue overpasses. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures. In addition, this segment of I-4 does not have sufficient right-of-way for the construction of ground mounted noise barriers. Fairbanks Avenue limits the length of noise barriers along the I-4 western right-of-way line at the north end of this residential community.

The results of the reassessment of noise barriers for this location are summarized in Table 3.8 (located at the end of Section 3.2.8). Five conceptual barrier designs were evaluated to reduce traffic noise levels at the 105 residences predicted to be impacted by design year traffic noise. All of the conceptual barrier designs considered met the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. Of these alternative barrier designs, CD4-3E is considered the most feasible. CD4-3E represents a combination of two shoulder mounted noise barriers: 1) an 8-foot and 14-foot-tall and 4,880-foot-long
noise barrier located along the outside shoulder of the I-4 westbound lanes and the I-4 westbound on ramp from Fairbanks Avenue from Stations 315+00 to 363+80, and 2) an 8-foot-tall and 400-foot-long noise barrier located along the outside shoulder of the I-4 westbound lanes on the Fairbanks Avenue overpass from Station 360+00 to 364+00 (see Figure 3-2, Sheets 14 and 15 of 29). CD4-3E provides benefit to 109 residences, an average noise reduction of 8.0 dB(A) at benefited receptor sites with a maximum reduction of 13.0 dB(A), and has a cost per benefited residence of $18,073 with an estimated construction cost of $1,969,920. In comparison to the previously recommended conceptual noise barrier designs, CD4-3E has similar limits but uses a maximum shoulder barrier height of 14 feet versus 16 feet. For safety, 14 feet is currently the maximum height for noise barriers along the roadway shoulder.

An existing outdoor advertising sign is located west of I-4 and south of Minnesota Avenue on a parcel owned by FDOT. Prior to design and construction of the recommended noise barrier, consideration of the potential that the noise barrier might block the motorist view of an existing, conforming and legally permitted outdoor advertising sign will be evaluated per FDOT’s PD&E Manual, Volume 2, Chapter 17, Noise (May 24, 2011).

In summary, noise barriers are still considered reasonable and feasible at this location. Noise barriers, specifically Conceptual Barrier Design CD4-3E, are recommended for further consideration for design and construction and public input. Conceptual Barrier Design CD4-3E is acoustically feasible and meets FDOT’s cost reasonableness criteria as well as the 7 dB(A) noise reduction design goal. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities.

The viewpoints of the benefited receptor sites are currently unknown but will be determined prior to the design and construction of the noise barrier at this location. No prior surveys of the benefited receptor sites in this area have been performed to determine their support for a noise barrier.
3.1.8 Noise Sensitive Area 3-F

Noise Sensitive Area 3-F encompasses the single family residences located east of I-4 and south of Fairbanks Avenue (see Figures 3-1 and 3-2, Sheets 14 and 15 of 29). This residential area includes the Olympia Heights subdivision based on the Orange County Property Appraiser Website. Noise barriers were considered reasonable and feasible at this location as identified in the 2002 PD&E Noise Impact Report, the 2002 ROD, and in the I-4 Noise Barrier Analysis Technical Memorandum revised November 22, 2005. The information available from these reports regarding the location, dimensions, effectiveness, and cost of the previously recommended noise barriers is summarized at the bottom of Table 3.9.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously recommended. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e, 1 dB(A)] or exceed the NAC of 67 dB(A).

Due to site conditions at this location, shoulder mounted noise barriers were considered the only viable option. The proposed I-4 travel lanes will be at least 20 feet higher than the adjacent ground elevations in the vicinity of the Minnesota Avenue and Fairbanks Avenue overpasses. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures. In addition, this segment of I-4 does not have sufficient right-of-way for the construction of ground mounted noise barriers. Fairbanks Avenue limits the length of noise barriers along the I-4 eastern right-of-way line at the north end of this residential community.

The results of the reassessment of noise barriers for this location are summarized in Table 3.9 (located at the end of Section 3.2.8). Five conceptual barrier designs were evaluated to reduce traffic noise levels at the 30 residences predicted to be impacted by design year traffic noise. All of the conceptual barrier designs considered except for CD1-3F (i.e., an 8-foot-tall shoulder mounted barrier) met the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. Of these alternative barrier designs, CD5-3F is considered the most feasible. CD5-3F represents a combination of two shoulder mounted
noise barriers: 1) an 8-foot and 14-foot-tall and 1,740-foot-long noise barrier located along the outside shoulder of the I-4 eastbound lanes and the I-4 eastbound off ramp to Fairbanks Avenue from Stations 343+30 to 360+70, and 2) an 8-foot-tall and 400-foot-long noise barrier located along the outside shoulder of the I-4 eastbound lanes on the Fairbanks Avenue overpass from Station 357+00 to 361+00 (see Figure 3-2, Sheet 15 of 29). CD5-3F provides benefit to 35 residences, an average noise reduction of 7.1 dB(A) at benefited receptor sites with a maximum reduction of 9.6 dB(A), and has a cost per benefited residence of $21,771 with an estimated construction cost of $762,000. In comparison to the previously recommended conceptual noise barrier designs, CD5-3F includes two shoulder barriers versus just one along the I-4 eastbound lanes and the off ramp to Fairbanks. The second is an 8-foot-tall shoulder mounted barrier along I-4 on the Fairbanks overpass. In addition, CD5-3F uses a maximum shoulder barrier height of 14 feet versus 16 feet. For safety, 14 feet is currently the maximum height for noise barriers along the roadway shoulder. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.

In summary, noise barriers are still considered reasonable and feasible at this location. Noise barriers, specifically Conceptual Barrier Design CD5-3F, are recommended for further consideration for design and construction and public input. Conceptual Barrier Design CD5-3F is acoustically feasible and meets FDOT’s cost reasonableness criteria as well as the 7 dB(A) noise reduction design goal. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities.

The viewpoints of the benefited receptor sites are currently unknown but will be determined prior to the design and construction of the noise barrier at this location. No prior surveys of the benefited receptor sites in this area have been performed to determine their support for a noise barrier.
3.1.9 Noise Sensitive Area 4-C

Noise Sensitive Area 4-C encompasses the multi-family residences located west of I-4 between Wymore Road and SR 436/Altamonte Drive (see Figures 3-1 and 3-2, Sheets 19 and 20 of 29). This residential area includes numerous apartment complexes (i.e., Spring Lake Hills, Altamonte Manor, Ashley at Spring Valley, and The Oaks of Spring Valley) and a condominium complex (i.e., Serravella at Spring Valley) based on the Seminole County Property Appraiser Website. Noise barriers were considered reasonable and feasible at this location as identified in the 2002 PD&E Noise Impact Report, the 2005 ROD, and in the I-4 Design Phase Noise Study Update Report dated July 2009. The information available from these reports regarding the location, dimensions, effectiveness, and cost of the previously recommended noise barriers is summarized at the bottom of Table 3.10. The I-4 Design Phase Noise Study Update Report dated July 2009, presented the results of the reevaluation of the noise barrier for NSA 4-C located between the Orange County Line and north of Central Parkway (Design Section 5).

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously recommended. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e, 1 dB(A)] or exceed the NAC of 67 dB(A).

Due to site conditions at this location, 8-foot and 14-foot-tall shoulder mounted noise barriers were considered the only viable option. This segment of I-4 does not have sufficient right-of-way for the construction of ground mounted noise barriers. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures.

The results of the reassessment of noise barriers for this location are summarized in Table 3.10 (located at the end of Section 3.2.8). Two conceptual barrier designs were evaluated to reduce traffic noise levels at the 273 residences predicted to be impacted by design year traffic noise. Both of the conceptual barrier designs considered met the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. Of these alternative barrier designs, CD2-4C is considered the most feasible. CD2-4C represents a 14-foot-tall and 6,160-foot-long noise barrier located along the outside shoulder of
the I-4 westbound lanes from Station 546+00 to 607+50 (see Figure 3-2, Sheets 19 and 20 of 29). CD2-4C provides benefit to 519 residences, an average noise reduction of 9.3 dB(A) at benefited receptor sites with a maximum reduction of 17.7 dB(A), and has a cost per benefited residence of $4,985 with an estimated construction cost of $2,587,200. In comparison to the previously recommended conceptual noise barrier designs, CD2-4C has similar limits but uses a maximum shoulder barrier height of 14 feet versus 18 feet. For safety, 14 feet is currently the maximum height for noise barriers along the roadway shoulder. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.

In summary, noise barriers are still considered reasonable and feasible at this location. Noise barriers, specifically Conceptual Barrier Design CD2-4C, are recommended for further consideration for design and construction and public input. Conceptual Barrier Design CD2-4C is acoustically feasible and meets FDOT’s cost reasonableness criteria as well as the 7 dB(A) noise reduction design goal. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities.

The viewpoints of the benefited receptor sites are currently unknown but will be determined prior to the design and construction of the noise barrier at this location. No prior surveys of the benefited receptor sites in this area have been performed to determine their support for a noise barrier.
3.2 Reassessment of Other Noise Sensitive Areas

3.2.1 Noise Sensitive Area 2-AA

Noise Sensitive Area 2-AA encompasses the Lakeshore Landings Mobile Home Park and is located south of I-4 and east of John Young Parkway (see Figures 3-1 and 3-2, Sheet 7 of 29). The 1998 John Young Parkway/I-4 Interchange PD&E Study Noise Impact Report assessed design year noise impacts at this community. This residential area was predicted to experience design year traffic noise levels that approached or exceeded FHWA’s Noise Abatement Criteria. However, noise barriers were not determined to be reasonable for feasible abatement measures and were not recommended for further consideration. The information available from this report regarding the location, dimensions, effectiveness, and cost of the previous noise barrier analysis is summarized at the bottom of Table 3.11. The 2002 Noise Impact Report for the I-4 PD&E Study Design Section 2 did not reassess this residential area or identify it as a specific NSA.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously evaluated. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e, 1 dB(A)] or exceed the NAC of 67 dB(A).

Due to site conditions at this location, 8-foot and 14-foot-tall shoulder mounted noise barriers were considered the only viable option. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures. This segment of I-4 does not have sufficient right-of-way for the construction of ground mounted noise barriers. In addition, an existing 2-lane roadway (33rd Street) is also located between I-4 and this community.

The results of the reassessment of noise barriers for this location are summarized in Table 3.11 (located at the end of Section 3.2.8). Two conceptual barrier designs were evaluated to reduce traffic noise levels at the 54 residences predicted to be impacted by design year traffic noise. Only CD2-2AA meets the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. CD2-2AA represents a 14-foot-
tall and 2,070-foot-long noise barrier located along the outside shoulder of the I-4 eastbound lanes from Station 1153+30 to 1174+00 (see Figure 3-2, Sheet 7 of 29). CD2-2AA provides benefit to 44 residences, an average noise reduction of 6.8 dB(A) at benefited receptor sites with a maximum reduction of 8.1 dB(A), and has a cost per benefited residence of $19,759 with an estimated construction cost of $869,400. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.

Noise barriers, specifically Conceptual Barrier Design CD2-AA, were recommended for further consideration and public input. Conceptual Barrier Design CD2-AA is acoustically feasible and meets FDOT’s cost reasonableness criteria as well as the 7 dB(A) noise reduction design goal. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities. However, during preliminary coordination with the property owner of the mobile home park, the owner indicated that they did not support the construction of the noise barrier. Therefore, construction of a noise barrier at this location is considered not reasonable due to lack of support and is not recommended for further consideration for design and construction. The property owner will be officially surveyed prior to the design phase of the project to document their position regarding the noise barrier.
3.2.2 Noise Sensitive Area 2-BB

Noise Sensitive Area 2-BB encompasses the single family and multi-family residences located north of I-4 and east of John Young Parkway (see Figures 3-1 and 3-2, Sheets 6 and 7 of 29). This residential area includes two subdivisions (i.e., Isles of Catalina and Thirty Third Street Park), an apartment complex (i.e., Governor’s Manor) and condominium complex (i.e., Catalina Isles) based on the Orange County Property Appraiser Website. The 1998 John Young Parkway/I-4 Interchange PD&E Study Noise Impact Report assessed design year noise impacts at this community. This residential area was predicted to experience design year traffic noise levels that approached or exceeded FHWA’s Noise Abatement Criteria. However, noise barriers were not determined to be a reasonable and feasible abatement measure and were not recommended for further consideration. The information available from this report regarding the location, dimensions, effectiveness, and cost of the previous noise barrier analysis is summarized at the bottom of Table 3.12. The 2002 Noise Impact Report for the I-4 PD&E Study Design Section 2 did not reassess this residential area or identify it as a specific NSA.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously evaluated. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e, 1 dB(A)] or exceed the NAC of 67 dB(A).

Due to site conditions at this location, 8-foot and 14-foot-tall shoulder mounted noise barriers were considered the only viable option. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures. This segment of I-4 does not have sufficient right-of-way for the construction of ground mounted noise barriers. In addition, an existing 2-lane roadway (L B McLeod Road) is also located between I-4 and this community.

The results of the reassessment of noise barriers for this location are summarized in Table 3.12 (located at the end of Section 3.2.8). Three conceptual barrier designs were evaluated to reduce traffic noise levels at the 37 residences predicted to be impacted by design year traffic noise. All three of the conceptual noise barrier designs meet the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. Of these alternative barrier designs, CD3-2BB is considered the most feasible. CD3-2BB
represents a 14-foot-tall and 2,760-foot-long noise barrier located along the outside shoulder of the I-4 westbound lanes from Station 1144+70 to 1172+00 (see Figure 3-2, Sheets 6 and 7 of 29). CD3-2BB provides benefit to 56 residences, an average noise reduction of 7.2 dB(A) at benefited receptor sites with a maximum reduction of 9.8 dB(A), and has a cost per benefited residence of $20,700 with an estimated construction cost of $1,159,200. For safety, 14 feet is currently the maximum height for noise barriers along the roadway shoulder. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.

Noise barriers, specifically Conceptual Barrier Design CD3-2BB, are recommended for further consideration for design and construction and public input. Conceptual Barrier Design CD3-2BB is acoustically feasible and meets FDOT’s cost reasonableness criteria as well as the 7 dB(A) noise reduction design goal. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities. Unlike the results presented in the 1998 PD&E Study Noise Impact Report, noise barriers were determined to be a reasonable and feasible abatement measure at this location.

The viewpoints of the benefited receptor sites are currently unknown but will be determined prior to the design and construction of the noise barrier at this location. No prior surveys of the benefited receptor sites in this area have been performed to determine their support for a noise barrier.
3.2.3 Noise Sensitive Area 2-B

Noise Sensitive Area 2-B encompasses the single family and multi-family residences located north of I-4 and west of Rio Grande Avenue (see Figures 3-1 and 3-2, Sheet 7 of 29). This residential area includes the Rio Grande subdivision and an apartment complex (i.e., Royal Summit Apartments) based on the Orange County Property Appraiser Website. As identified in the 2002 PD&E Noise Impact Report, noise barriers were not considered reasonable and feasible at this location. The information available from this report regarding the location, dimensions, effectiveness, and cost of the previous noise barrier analysis is summarized at the bottom of Table 3.13. The I-4 Noise Analysis Reevaluation Technical Memorandum dated February 2006 did not reassess noise barriers at this residential area.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously evaluated. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e, 1 dB(A)] or exceed the NAC of 67 dB(A).

Due to site conditions at this location, 8-foot and 14-foot-tall shoulder mounted noise barriers were considered the only viable option. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures. This segment of I-4 does not have sufficient right-of-way for the construction of ground mounted noise barriers. In addition, an existing 2-lane roadway (L B McLeod Road) is also located between I-4 and this community.

The results of the reassessment of noise barriers for this location are summarized in Table 3.13 (located at the end of Section 3.2.8). Two conceptual barrier designs were evaluated to reduce traffic noise levels at the 69 residences predicted to be impacted by design year traffic noise. Only CD2-2B meets the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. CD2-2B represents an 8-foot and 14-foot-tall and 1,750-foot-long noise barrier located along the outside shoulder of the I-4 westbound lanes from Station 1181+00 to 1198+50 (see Figure 3-2, Sheet 7 of 29). CD2-2B provides benefit to 73 residences, an average noise reduction of 8.1 dB(A) at benefited receptor sites with a maximum reduction of 11.1 dB(A), and has a cost per benefited residence of $9,205 with an estimated
construction cost of $672,000. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.

Noise barriers, specifically Conceptual Barrier Design CD2-2B, are recommended for further consideration for design and construction and public input. Conceptual Barrier Design CD2-2B is acoustically feasible and meets FDOT’s cost reasonableness criteria as well as the 7 dB(A) noise reduction design goal. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities. Unlike the results presented in the 2002 PD&E Study Noise Impact Report, noise barriers were determined to be a reasonable and feasible abatement measure at this location.

The viewpoints of the benefited receptor sites are currently unknown but will be determined prior to the design and construction of the noise barrier at this location. No prior surveys of the benefited receptor sites in this area have been performed to determine their support for a noise barrier.
3.2.4 Noise Sensitive Area 3-G

Noise Sensitive Area 3-G encompasses the single family residences located west of I-4 and north of Fairbanks Avenue (see Figures 3-1 and 3-2, Sheets 15 and 16 of 29). This residential area includes the Fairbanks Shores subdivision based on the Orange County Property Appraiser Website. As identified in the 2002 PD&E Noise Impact Report, noise barriers were not considered reasonable and feasible at this location. The information available from this report regarding the location, dimensions, effectiveness, and cost of the previous noise barrier analysis is summarized at the bottom of Table 3.14. The I-4 Noise Barrier Analysis Technical Memorandum revised November 22, 2005, indicated that the potential for design year traffic noise impacts to this area was reassessed. However, no residences were predicted to approach or exceed FHWA’s Noise Abatement Criteria so noise barriers were not reconsidered for this area.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously evaluated. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e., 1 dB(A)] or exceed the NAC of 67 dB(A).

Both ground mounted and shoulder mounted conceptual barrier designs were evaluated. However, ground mounted noise barriers have limited effectiveness because the proposed I-4 westbound lanes will be at least 20 feet higher than the adjacent ground elevations in the residential neighborhood. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures.

The results of the reassessment of noise barriers for this location are summarized in Table 3.14 (located at the end of Section 3.2.8). Five conceptual barrier designs were evaluated to reduce traffic noise levels at the seven residences predicted to be impacted by design year traffic noise. Only CD4-3G, representing an 8-foot and 14-foot-tall shoulder mounted noise barrier, meets the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. However, CD1-3G is considered the most feasible conceptual design at this location. Compared to CD4-3G, CD1-3G maximizes the number of benefited
residences (i.e., 20 versus 11) and covers the entire community. CD1-3G represents an 8-foot-tall and 1,980-foot-long noise barrier located along the outside shoulder of the I-4 westbound lanes from Station 378+50 to 398+00 (see Figure 3-2, Sheets 15 and 16 of 29). Although it does not meet the 7 dB(A) noise reduction design goal, CD1-3G provides benefit to 20 residences, an average noise reduction of 5.4 dB(A) at benefited receptor sites with a maximum reduction of 5.7 dB(A), and has a cost per benefited residence of $23,760 with an estimated construction cost of $475,200. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.

Noise barriers, specifically Conceptual Barrier Design CD1-3G, are recommended for further consideration for design and construction and public input. Conceptual Barrier Design CD1-3G is acoustically feasible and meets FDOT’s cost reasonableness criteria and maximizes the number of benefited receptor sites. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities. Unlike the results presented in the 2002 PD&E Study Noise Impact Report, noise barriers were determined to be a reasonable and feasible abatement measure at this location.

The viewpoints of the benefited receptor sites are currently unknown but will be determined prior to the design and construction of the noise barrier at this location. No prior surveys of the benefited receptor sites in this area have been performed to determine their support for a noise barrier.
3.2.5 Noise Sensitive Area 3-H

Noise Sensitive Area 3-H encompasses the single family residences located east of I-4 and north of Fairbanks Avenue (see Figures 3-1 and 3-2, Sheets 15 and 16 of 29). This residential area includes the School Terrace and Glencoe subdivisions based on the Orange County Property Appraiser Website. As identified in the 2002 PD&E Noise Impact Report, noise barriers were not considered reasonable and feasible at this location. The I-4 Noise Barrier Analysis Technical Memorandum revised November 22, 2005, indicated that this area was reassessed for design year traffic noise impacts and that noise barriers were considered reasonable and feasible at this location. The information available from these reports regarding the location, dimensions, effectiveness, and cost of the previous noise barrier analysis are summarized at the bottom of Table 3.15.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously recommended. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e., 1 dB(A)] or exceed the NAC of 67 dB(A).

Due to site conditions at this location, shoulder mounted noise barriers were considered the only viable option. The proposed I-4 travel lanes will be at least 20 feet higher than the adjacent ground elevations in the vicinity of the Fairbanks Avenue and Wymore Road overpasses. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures. Fairbanks Avenue limits the length of noise barriers along the I-4 eastern right-of-way line at the southern end of this residential area.

The results of the reassessment of noise barriers for this location are summarized in Table 3.15 (located at the end of Section 3.2.8). Seven conceptual barrier designs were evaluated to reduce traffic noise levels at the 58 residences predicted to be impacted by design year traffic noise. None of the conceptual barrier designs (i.e., CD1-3H through CD4-3H) with only 8-foot-tall shoulder mounted noise barriers met the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. Of the alternative barrier designs with a combination of 8-foot and 14-foot-tall shoulder barriers, CD7-3H is considered the

Due to site conditions at this location, shoulder mounted noise barriers were considered the only viable option. The proposed I-4 travel lanes will be at least 20 feet higher than the adjacent ground elevations in the vicinity of the Fairbanks Avenue and Wymore Road overpasses. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures. Fairbanks Avenue limits the length of noise barriers along the I-4 eastern right-of-way line at the southern end of this residential area.

The results of the reassessment of noise barriers for this location are summarized in Table 3.15 (located at the end of Section 3.2.8). Seven conceptual barrier designs were evaluated to reduce traffic noise levels at the 58 residences predicted to be impacted by design year traffic noise. None of the conceptual barrier designs (i.e., CD1-3H through CD4-3H) with only 8-foot-tall shoulder mounted noise barriers met the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. Of the alternative barrier designs with a combination of 8-foot and 14-foot-tall shoulder barriers, CD7-3H is considered the
most feasible. CD7-3H represents a combination of two shoulder mounted noise barriers: 1) an 8-foot and 14-foot-tall and 2,830-foot-long noise barrier located along the outside shoulder of the I-4 eastbound lanes and the I-4 eastbound on ramp from Fairbanks Avenue from Stations 363+70 to 392+00, and 2) an 8-foot-tall and 900-foot-long noise barrier located along the outside shoulder of the I-4 eastbound lanes on the Fairbanks Avenue overpass from Station 361+00 to 370+00 (see Figure 3-2, Sheets 15 and 16 of 29). CD7-3H provides benefit to 49 residences, an average noise reduction of 6.9 dB(A) at benefited receptor sites with a maximum reduction of 11.8 dB(A), and has a cost per benefited residence of $25,720 with an estimated construction cost of $1,260,270. In comparison to the previously recommended conceptual noise barrier designs, CD7-3H has similar limits but uses a maximum shoulder barrier height of 14 feet versus 16 feet. For safety, 14 feet is currently the maximum height for noise barriers along the roadway shoulder. Also, CD7-3H includes an 8-foot-tall shoulder mounted barrier on the Fairbanks Avenue overpass to help maximize the number of benefited receptor sites.

Noise barriers, specifically Conceptual Barrier Design CD7-3H, are recommended for further consideration for design and construction and public input. Conceptual Barrier Design CD7-3H is acoustically feasible and meets FDOT’s cost reasonableness criteria as well as the 7 dB(A) noise reduction design goal. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities. Unlike the results presented in the 2002 PD&E Study Noise Impact Report, noise barriers were determined to be a reasonable and feasible abatement measure at this location which is consistent with the findings in the I-4 Noise Barrier Analysis Technical Memorandum revised November 22, 2005.

The viewpoints of the benefited receptor sites are currently unknown but will be determined prior to the design and construction of the noise barrier at this location. No prior surveys of the benefited receptor sites in this area have been performed to determine their support for a noise barrier.

An existing outdoor advertising sign is located east of I-4 and south of Minnesota Avenue on a parcel owned by FDOT. Prior to design and construction of the recommended noise barrier, consideration of the potential that the noise barrier might block the motorist view of an existing, conforming and legally permitted outdoor advertising sign will be evaluated per FDOT’s PD&E Manual, Volume 2, Chapter 17, Noise (May 24, 2011).
3.2.6 Noise Sensitive Area 4-D

Noise Sensitive Area 4-D encompasses the single family residences located east of I-4 and north of Wymore Road along Flame Avenue (see Figures 3-1 and 3-2, Sheet 19 of 29). This residential area includes the Hidden Estates subdivision based on the Orange County Property Appraiser Website. As identified in the 2002 PD&E Noise Impact Report, noise barriers were not considered reasonable and feasible at this location. The information available from this report regarding the location, dimensions, effectiveness, and cost of the previous noise barrier analysis is summarized at the bottom of Table 3.16. The I-4 Design Phase Noise Study Update Report dated July 2009 did not reassess noise barriers at this residential area.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously evaluated. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e, 1 dB(A)] or exceed the NAC of 67 dB(A).

Both ground mounted and shoulder mounted conceptual barrier designs were evaluated. The dimensions of a ground mounted barrier along the existing right-of-way are not restricted by access roads, water bodies, utilities, or other land use features. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures. An existing ~8-foot-tall privacy wall is located between I-4 and the residences in this community. The existing privacy wall helps to minimize traffic noise levels but also minimizes the effectiveness of noise barriers in this area.

The results of the reassessment of noise barriers for this location are summarized in Table 3.16 (located at the end of Section 3.2.8). Six conceptual barrier designs were evaluated to reduce traffic noise levels at the 6 residences predicted to be impacted by design year traffic noise. All of the conceptual barrier designs considered exceed the reasonable cost criteria of $42,000 per benefited receptor site and only one (i.e., CD6-4D) meets the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. Of the alternative conceptual barrier designs evaluated for this community, CD4-4D is the least costly. CD4-4D represents an 18-foot-tall ground mounted noise barrier extending 1,400 feet from Stations 552+00 to 566+00 (see Figures 3-1 and 3-2, Sheet 19 of 29). CD4-4D provides
benefit to seven residences, an average noise reduction of 5.6 dB(A) at benefited receptor sites with a maximum reduction of 5.9 dB(A), and has a cost per benefited residence of $108,000 with an estimated construction cost of $756,000. CD4-4D is not recommended for further consideration and public input. This barrier design does not meet FDOT's cost criteria of $42,000 per benefited site. The high cost of providing noise abatement at this community is attributed to the low number of residential sites (i.e., six) impacted by the project and the low number of benefited sites (i.e., seven). The low number of impacted receptor sites is attributed to the existing ~8-foot-tall privacy wall. In summary, noise barriers are still not considered reasonable and feasible at this location and are not recommended for further consideration or public input which is consistent with the findings in 2002 PD&E Noise Impact Report.
3.2.7 Noise Sensitive Area 4-G

Noise Sensitive Area 4-G encompasses the single family residences located east of I-4 and between Central Parkway and SR 434 (see Figures 3-1 and 3-2, Sheets 22 and 23 of 29). This residential area includes the Sanorlando Springs and Raymond Oaks subdivisions based on the Seminole County Property Appraiser Website. As identified in the 2002 PD&E Noise Impact Report, noise barriers were not considered reasonable and feasible at this location. The information available from this report regarding the location, dimensions, effectiveness, and cost of the previous noise barrier analysis is summarized at the bottom of Table 3.17. The I-4 Design Phase Noise Study Update Report dated July 2009 did not reassess noise barriers at this residential area.

A review of the current land uses and the Preliminary Design Plans indicates this area is still residential and that it would likely be impacted by the design year traffic noise levels associated with the I-4 Ultimate Project. In addition, site conditions do not limit the ability to construct noise barriers within this area. Therefore, this area was reassessed for noise barriers to evaluate the effectiveness of alternative conceptual designs compared to the dimensions previously recommended. Residential land uses are included in NAC Activity Category B which requires the consideration of noise abatement measures when design year noise levels approach [i.e, 1 dB(A)] or exceed the NAC of 67 dB(A).

The site conditions do not limit the ability to construct noise barriers within this area but shoulder mounted noise barriers were considered the only viable option. Ground mounted noise barriers would have limited effectiveness because the proposed I-4 eastbound lanes as shown in the Reference Design Plans for Sections 4 and 5 will be generally four to eight feet higher than the adjacent ground elevations in the residential neighborhoods and along the eastern right-of-way line. Due to safety and constructability issues, the height of shoulder mounted barriers is limited to 14 feet and to 8 feet on bridge structures.

The results of the reassessment of noise barriers for this location are summarized in Table 3.17 (located at the end of Section 3.2.8). Three conceptual barrier designs were evaluated to reduce traffic noise levels at the 72 residences predicted to be impacted by design year traffic noise. All three of the conceptual noise barrier designs meet the reasonable cost criteria of $42,000 per benefited receptor site and the minimum noise reduction design goal of at least 7.0 dB(A) for at least one impacted receptor site. Of these alternative barrier designs, CD3-4G is considered the most feasible. CD3-4G represents a 14-foot-tall and 5,900-foot-long noise barrier located along the outside shoulder of the I-4
eastbound lanes from Station 660+50 to 719+50 (see Figure 3-2, Sheets 22 and 23 of 29). CD3-4G provides benefit to 110 residences, an average noise reduction of 9.0 dB(A) at benefited receptor sites with a maximum reduction of 13.7 dB(A), and has a cost per benefited residence of $22,527 with an estimated construction cost of $2,478,000.

Noise barriers, specifically Conceptual Barrier Design CD3-4G, are recommended for further consideration for design and construction and public input. Conceptual Barrier Design CD3-4G is acoustically feasible and meets FDOT’s cost reasonableness criteria as well as the 7 dB(A) noise reduction design goal. This conceptual barrier design also satisfies the other reasonableness and feasibility factors considered in the evaluation of noise abatement measures including safety, constructability and utilities. Unlike the results presented in the 2002 PD&E Study Noise Impact Report, noise barriers were determined to be a reasonable and feasible abatement measure at this location. The use of shoulder mounted noise barriers versus ground mounted noise barriers along the elevated segments of I-4 contributed to a more cost effective barrier design that meets FDOT’s Noise Abatement Criteria.

The viewpoints of the benefited receptor sites are currently unknown but will be determined prior to the design and construction of the noise barrier at this location. No prior surveys of the benefited receptor sites in this area have been performed to determine their support for a noise barrier.

Three existing bidirectional outdoor advertising sign are located east of I-4 between Central Parkway and SR 434 in the vicinity of Station 680+00. Prior to design and construction of the recommended noise barrier, consideration of the potential that the noise barrier might block the motorist view of an existing, conforming and legally permitted outdoor advertising sign will be evaluated per FDOT’s PD&E Manual, Volume 2, Chapter 17, Noise (May 24, 2011).
3.2.8 Noise Sensitive Area 4-I

Noise Sensitive Area 4-I encompasses the single family and multi-family residences located east of I-4 and north of SR 434 (see Figures 3-1 and 3-2, Sheets 23 and 24 of 29). This residential area includes a condominium complex (Springwood Village) and the Sleepy Hollow and Lake Oaks subdivisions based on the Seminole County Property Appraiser Website. The noise barrier considered reasonable and feasible in the 2002 Noise Study Report has already been constructed as part of a separate project. The information available from this report regarding the location, dimensions, effectiveness, and cost of the previous noise barrier analysis is summarized at the bottom of Table 3.18.

A review of the Reference Design Plans for Section 6 indicated that up to 900 feet of the existing ~18-foot-tall ground mounted noise barrier for NSA 4-I was proposed to be removed and replaced. To minimize the amount of the existing noise barrier to be relocated, the Preliminary Design Plans were revised to require only 60 feet versus 900 feet of the existing noise barrier to be replaced. Therefore, the southern end of the existing noise barrier was evaluated to determine the most feasible replacement noise barrier design. Due to an existing stormwater pond to the south of the existing noise barrier and limited available right-of-way, only 8-foot and 14-foot-tall shoulder mounted noise barriers were considered to be viable replacement options.

The results of the assessment to identify a replacement noise barrier for this location are summarized in Table 3.18 (located at the end of Section 3.2.8). Three conceptual barrier designs were evaluated to reduce traffic noise levels at the 12 residences predicted to be impacted by design year traffic noise resulting from the removal of 60 feet of the existing noise barrier (CD3-4I through CD5-4I). Of these replacement barrier designs, CD5-4I is considered the most feasible. CD5-4I represents a 14-foot-tall and 450-foot-long noise barrier located along the outside shoulder of the I-4 eastbound lanes from Station 734+35 to 738+85 (see Figure 3-2, Sheet 23 of 29). CD5-4I provides benefit to all 12 impacted residences, with a maximum reduction of 13.9 dB(A) and an estimated construction cost of $189,000. Due to the effectiveness and relatively low cost, CD5-4I is recommended for further consideration for design and construction and public input.
| Table 3.2 Noise Barrier Analyses for Residential Areas Located West of I-4 and South of SR 408 - Noise Sensitive Area 2-E |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Conceptual Barrier Design Number | Barrier Type | Barrier Location | Height (feet) | Length (feet) | Begin Station Number | End Station Number | Number of Impacted Receptor Sites | Average (Maximum) Noise Reduction for Impacted Receptor Sites dB(A) | Number of Impacted/ Benefited Receptor Sites | Number of Benefited Receptor Sites/ Not Impacted | Total Number of Benefited Receptor Sites | Average Noise Reduction for all Benefited Receptor Sites dB(A) | Cost ($30 per square foot) | Average Cost/Site Benefited | Comments |
| I-4 PS&E Noise Study Report Section 2 dated August 2002 - Noise Sensitive Area 2-E (Griffin Park Apartments) | --- | Shoulder Mounted | 14 Westbound On Ramp C1 on Bridge Structure and MSE/Retaining Wall | 14.0 (Average) | 2,950 | --- | --- | 137 | --- | --- | --- | 152 | --- | $330,000 | $0,434 | Noise barriers considered reasonable and feasible at this location in the 2002 Noise Study Report |
| I-4 Noise Analysis Reevaluation Technical Memorandum dated February 2006 - Orange Blossom Trail to Ivanhoe Boulevard - Noise Sensitive Area 2-E (Griffin Park Apartments) | --- | Shoulder Mounted | 14 Westbound On Ramp C1 on Bridge Structure and MSE/Retaining Wall | 11.0 (Average) | 3,506 | 118+00 | 629+00 (SR 408) | 143 | --- | 77 | 15 | 92 | --- | $995,780 | $10,508 | Noise barriers considered reasonable and feasible at this location in the 2006 Technical Memorandum |
| Referenced Design Plans (Section 2) 50% Dated March 30, 2012 - Noise Sensitive Area 2-E (Griffin Park Apartments) | --- | Shoulder Mounted | 14 Westbound On Ramp C1 from Westbound SR 408 on MSE/Retaining Wall | 8 | 108 | 120+70 | 120+10 | --- | > 5.0 (>10.0) | --- | --- | --- | --- | $777,600 | --- | Noise barrier limits identified in the Reference Design Plans Section 2, Recommended for further consideration and public input |

Noise barrier recommended for further consideration and public input.
### Table 3.3 Noise Barrier Analyses for Residential Areas Located West of I-4 between Kayley Avenue and Gore Street - Noise Sensitive Area 2-F

<table>
<thead>
<tr>
<th>Conceptual Barriers Design Number</th>
<th>Barrier Type</th>
<th>Barrier Location</th>
<th>Height (feet)</th>
<th>Length (feet)</th>
<th>Begin Station Number</th>
<th>End Station Number</th>
<th>Number of Impacted Receptor Sites</th>
<th>Number of Impacted/ Benefited Receptor Sites dBA</th>
<th>Number of Benefited Receptor Sites</th>
<th>Total Number of Benefited Receptor Sites</th>
<th>Average Noise Reduction for all Benefited Receptor Sites dBA</th>
<th>Cost ($30 per square foot)</th>
<th>Average Cost/Site Benefited</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD1-2F</td>
<td>Shoulder Mounted Segment</td>
<td>I-4 Westbound Outside Shoulder on MSE Wall</td>
<td>8</td>
<td>3,000</td>
<td>84+00</td>
<td>114+00</td>
<td>41</td>
<td>4.7 (8.3)</td>
<td>16</td>
<td>0</td>
<td>16</td>
<td>6.3</td>
<td>$1,180,000</td>
<td>$73,800</td>
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<tr>
<td></td>
<td>Ground Mounted Segment</td>
<td>Right-of-Way Line West of I-4 Westbound On Ramp from Gore Street</td>
<td>16</td>
<td>960</td>
<td>113+40</td>
<td>119+40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD2-2F</td>
<td>Shoulder Mounted Segment</td>
<td>I-4 Westbound Outside Shoulder on MSE Wall</td>
<td>14</td>
<td>3,050</td>
<td>84+00</td>
<td>114+00</td>
<td>41</td>
<td>7.2 (12.8)</td>
<td>36</td>
<td>29</td>
<td>65</td>
<td>6.9</td>
<td>$1,884,200</td>
<td>$23,911</td>
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<td>Ground Mounted Segment</td>
<td>Right-of-Way Line West of I-4 Westbound On Ramp from Gore Street</td>
<td>14</td>
<td>960</td>
<td>113+40</td>
<td>119+40</td>
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<td>CD3-2F</td>
<td>Shoulder Mounted Segment</td>
<td>I-4 Westbound Outside Shoulder on MSE Wall</td>
<td>14</td>
<td>3,050</td>
<td>84+00</td>
<td>114+00</td>
<td>41</td>
<td>7.3 (12.8)</td>
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<td>33</td>
<td>71</td>
<td>6.8</td>
<td>$1,741,800</td>
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<td>Ground Mounted Segment</td>
<td>Right-of-Way Line West of I-4 Westbound On Ramp from Gore Street</td>
<td>16</td>
<td>960</td>
<td>113+40</td>
<td>119+40</td>
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<td></td>
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<td></td>
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<td></td>
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<tr>
<td>CD4-2F</td>
<td>Shoulder Mounted Segment</td>
<td>I-4 Westbound Outside Shoulder on MSE Wall</td>
<td>14</td>
<td>3,050</td>
<td>84+00</td>
<td>114+00</td>
<td>41</td>
<td>7.4 (12.8)</td>
<td>38</td>
<td>33</td>
<td>71</td>
<td>6.9</td>
<td>$1,799,400</td>
<td>$23,344</td>
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<td>Ground Mounted Segment</td>
<td>Right-of-Way Line West of I-4 Westbound On Ramp from Gore Street</td>
<td>18</td>
<td>960</td>
<td>113+40</td>
<td>119+40</td>
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<td>CD5-2F</td>
<td>Shoulder Mounted Segment</td>
<td>I-4 Westbound Outside Shoulder on MSE Wall</td>
<td>14</td>
<td>3,050</td>
<td>84+00</td>
<td>114+00</td>
<td>41</td>
<td>7.4 (12.8)</td>
<td>38</td>
<td>33</td>
<td>71</td>
<td>7.0</td>
<td>$1,857,000</td>
<td>$26,155</td>
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<td>Ground Mounted Segment</td>
<td>Right-of-Way Line West of I-4 Westbound On Ramp from Gore Street</td>
<td>20</td>
<td>960</td>
<td>113+40</td>
<td>119+40</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>CD6-2F</td>
<td>Shoulder Mounted Segment</td>
<td>I-4 Westbound Outside Shoulder on MSE Wall</td>
<td>14</td>
<td>3,050</td>
<td>84+00</td>
<td>114+00</td>
<td>41</td>
<td>7.4 (12.8)</td>
<td>38</td>
<td>35</td>
<td>73</td>
<td>6.9</td>
<td>$1,914,600</td>
<td>$26,227</td>
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<td>Ground Mounted Segment</td>
<td>Right-of-Way Line West of I-4 Westbound On Ramp from Gore Street</td>
<td>22</td>
<td>960</td>
<td>113+40</td>
<td>119+40</td>
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</tr>
</tbody>
</table>

**Noise Sensitive Area 2-F (Stations 84+00 to 120+00; West of I-4)**

**Shoulder Mounted and Ground Mounted Barrier Combination Alternatives**

- **CD1-2F**
  - Shoulder Mounted Segment: I-4 Westbound Outside Shoulder on MSE Wall
  - Ground Mounted Segment: Right-of-Way Line West of I-4 Westbound On Ramp from Gore Street
  - Height: 8 feet
  - Length: 3,000 feet
  - Begin Station Number: 84+00
  - End Station Number: 114+00
  - Number of Impacted Receptor Sites: 41
  - Average Noise Reduction for Impacted Receptor Sites: 4.7 dB(A)
  - Cost: $1,180,000
  - Comments: ---

- **CD2-2F**
  - Shoulder Mounted Segment: I-4 Westbound Outside Shoulder on MSE Wall
  - Ground Mounted Segment: Right-of-Way Line West of I-4 Westbound On Ramp from Gore Street
  - Height: 14 feet
  - Length: 3,050 feet
  - Begin Station Number: 84+00
  - End Station Number: 114+00
  - Number of Impacted Receptor Sites: 41
  - Average Noise Reduction for Impacted Receptor Sites: 7.2 dB(A)
  - Number of Benefited Receptor Sites: 36
  - Cost: $1,884,200
  - Comments: ---

- **CD3-2F**
  - Shoulder Mounted Segment: I-4 Westbound Outside Shoulder on MSE Wall
  - Ground Mounted Segment: Right-of-Way Line West of I-4 Westbound On Ramp from Gore Street
  - Height: 14 feet
  - Length: 3,050 feet
  - Begin Station Number: 84+00
  - End Station Number: 114+00
  - Number of Impacted Receptor Sites: 41
  - Average Noise Reduction for Impacted Receptor Sites: 7.3 dB(A)
  - Number of Benefited Receptor Sites: 38
  - Cost: $1,741,800
  - Comments: Recommended for further consideration and public input

- **CD4-2F**
  - Shoulder Mounted Segment: I-4 Westbound Outside Shoulder on MSE Wall
  - Ground Mounted Segment: Right-of-Way Line West of I-4 Westbound On Ramp from Gore Street
  - Height: 14 feet
  - Length: 3,050 feet
  - Begin Station Number: 84+00
  - End Station Number: 114+00
  - Number of Impacted Receptor Sites: 41
  - Average Noise Reduction for Impacted Receptor Sites: 7.4 dB(A)
  - Number of Benefited Receptor Sites: 38
  - Cost: $1,799,400
  - Comments: ---

- **CD5-2F**
  - Shoulder Mounted Segment: I-4 Westbound Outside Shoulder on MSE Wall
  - Ground Mounted Segment: Right-of-Way Line West of I-4 Westbound On Ramp from Gore Street
  - Height: 14 feet
  - Length: 3,050 feet
  - Begin Station Number: 84+00
  - End Station Number: 114+00
  - Number of Impacted Receptor Sites: 41
  - Average Noise Reduction for Impacted Receptor Sites: 7.4 dB(A)
  - Number of Benefited Receptor Sites: 38
  - Cost: $1,857,000
  - Comments: ---

- **CD6-2F**
  - Shoulder Mounted Segment: I-4 Westbound Outside Shoulder on MSE Wall
  - Ground Mounted Segment: Right-of-Way Line West of I-4 Westbound On Ramp from Gore Street
  - Height: 14 feet
  - Length: 3,050 feet
  - Begin Station Number: 84+00
  - End Station Number: 114+00
  - Number of Impacted Receptor Sites: 41
  - Average Noise Reduction for Impacted Receptor Sites: 7.4 dB(A)
  - Number of Benefited Receptor Sites: 38
  - Cost: $1,914,600
  - Comments: ---

**I-4 PD&E Noise Study Report Section 2 dated August 2002 - Noise Sensitive Area 2-F**

- Ground Mounted and Shoulder Mounted: I-4 Westbound Shoulder and West Right-of-Way Line
  - Height: 16.1 (Average)
  - Length: 3,430 feet
  - Number of Impacted Receptor Sites: 56
  - Total Number of Benefited Receptor Sites: 56
  - Average Noise Reduction for all Benefited Receptor Sites: 6.9 dB(A)
  - Cost: $1,154,400
  - Comments: Noise barriers considered reasonable cost criteria and noise reduction design goal of at least 7.0 dB(A) reduction for at least one impacted receptor site; Noise barrier recommended for further consideration and public input

**I-4 Noise Analysis Reevaluation Technical Memorandum dated February 2005 - Orange Blossom Trail to Ivanhoe Boulevard - Noise Sensitive Area 2-F**

- Ground Mounted and Shoulder Mounted: I-4 Westbound Shoulder and West Right-of-Way Line
  - Height: 13.0 (Average)
  - Length: 3,373 feet
  - Number of Impacted Receptor Sites: 89
  - Total Number of Benefited Receptor Sites: 89
  - Average Noise Reduction for all Benefited Receptor Sites: 8.0 dB(A)
  - Cost: $1,187,961
  - Comments: Noise barriers considered reasonable cost criteria and noise reduction design goal of at least 7.0 dB(A) reduction for at least one impacted receptor site; Noise barrier recommended for further consideration and public input

---

Conceptual noise barrier design that meets FDOT's reasonable cost criteria and noise reduction design goal of at least a 7.0 dB(A) reduction for at least one impacted receptor site; Noise barrier recommended for further consideration and public input.
<table>
<thead>
<tr>
<th>Conceptual Barrier Design Number</th>
<th>Barrier Type</th>
<th>Barrier Location</th>
<th>Height (feet)</th>
<th>Length (feet)</th>
<th>Begin Station Number</th>
<th>End Station Number</th>
<th>Number of Impacted Receptor Sites</th>
<th>Number of Impacted/ Benefited Receptor Sites</th>
<th>Number of Benefited Receptor Sites</th>
<th>Total Number of Benefited Receptor Sites</th>
<th>Average Noise Reduction for all Benefited Receptor Sites (dB(A))</th>
<th>Cost ($30 per square foot)</th>
<th>Average Cost/Site Benefited</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>Noise Sensitive Area 2-H (Stations 5510+00 to 5538+00; North of SR 408 and West of I-4)</td>
<td>Shoulder Mounted</td>
<td>SR 408 Westbound on Bridge Structure and MSE/Retaining Wall</td>
<td>13.5</td>
<td>3.320</td>
<td>5517+55 (SR 408)</td>
<td>5538+77 (SR 408)</td>
<td>82</td>
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<td>---</td>
<td>$894,400</td>
<td>---</td>
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<tr>
<td>Noise Sensitive Area 2-I (South of SR 408 and East of I-4)</td>
<td>Shoulder Mounted</td>
<td>SR 408 Westbound on Bridge Structure and MSE/Retaining Wall</td>
<td>16.2</td>
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<tr>
<td>Noise Sensitive Area 2-J (North of SR 408 and East of I-4)</td>
<td>Shoulder Mounted</td>
<td>SR 408 Westbound on Bridge Structure and MSE/Retaining Wall</td>
<td>14.5</td>
<td>5.200</td>
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<td>68</td>
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<td>122</td>
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<td>$1,558,000</td>
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</table>

Noise barrier recommended for further consideration and public input.
<table>
<thead>
<tr>
<th>Conceptual Barrier Design</th>
<th>Barrier Type</th>
<th>Barrier Location</th>
<th>Average Height &amp; Overall Length of Barrier(s)</th>
<th>Number of Benefited Receptor Sites</th>
<th>Number of Benefited Receptor Sites Not Impacted</th>
<th>Total Number of Affected Receptor Sites</th>
<th>Average Noise Reduction for all Affected Receptor Sites (dB(A))</th>
<th>Cost ($30 per square foot)</th>
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<tbody>
<tr>
<td>Shoulder Mounted Alternatives</td>
<td>CD1-3B</td>
<td>Shoulder Mounted</td>
<td>4-Westbound &amp; Princeton Street Westbound On Ramp A on MSE Wall and Bridge Structure</td>
<td>13.3 3,000 242+00 275+00</td>
<td>84 7.0 (11.2)</td>
<td>84 7.0 (11.2)</td>
<td>7.7</td>
<td>$1,197,000</td>
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<td></td>
<td>CD2-3B</td>
<td>Shoulder Mounted - Segment 1</td>
<td>4-Westbound &amp; Princeton Street Westbound On Ramp A on MSE Wall and Bridge Structure</td>
<td>14 206 245+00 249+00</td>
<td>8 5.6 (7.8)</td>
<td>8 6 6.0</td>
<td>$1,036,000</td>
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<td>CD3-3B</td>
<td>Shoulder Mounted - Segment 2</td>
<td>4-Westbound &amp; Princeton Street Westbound Overpass on MSE Wall and Bridge Structure</td>
<td>8 900 270+00 279+00</td>
<td>84 7.0 (11.2)</td>
<td>84 7.0 (11.2)</td>
<td>7.7</td>
<td>$1,197,000</td>
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<td>CD4-3B</td>
<td>Shoulder Mounted - Segment 1</td>
<td>4-Westbound &amp; Princeton Street Westbound Overpass on MSE Wall and Bridge Structure</td>
<td>14 1,340 249+30 262+70</td>
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<td>CD5-3B</td>
<td>Shoulder Mounted - Segment 2</td>
<td>4-Westbound &amp; Princeton Street Westbound Overpass on Ramp A &amp; FIB</td>
<td>14 106 274+00 279+00</td>
<td>84 7.0 (11.3)</td>
<td>84 7.0 (11.3)</td>
<td>7.7</td>
<td>$1,413,000</td>
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<td>CD6-3B</td>
<td>Shoulder Mounted - Ground Mounted</td>
<td>4-Westbound &amp; Princeton Street Westbound Overpass on Ramp A &amp; FIB</td>
<td>16 250 272+50 275+00</td>
<td>84 5.0 (10.9)</td>
<td>84 5.0 (10.9)</td>
<td>6.1</td>
<td>$888,600</td>
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<td>Shoulder Mounted and Ground Mounted Barrier Combination Alternatives</td>
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<td>Shoulder Mounted</td>
<td>4-Westbound &amp; Princeton Street Westbound Overpass on Ramp A &amp; FIB</td>
<td>16 250 272+50 275+00</td>
<td>84 5.0 (10.9)</td>
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<td>$888,600</td>
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<td>Shoulder Mounted &amp; Ground Mounted</td>
<td>4-Westbound &amp; Princeton Street Westbound Overpass on Ramp A &amp; FIB</td>
<td>16 250 272+50 275+00</td>
<td>84 5.0 (10.9)</td>
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<td>6.1</td>
<td>$888,600</td>
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</table>

**Comments**
- Shoulder mounted noise barrier limits match those in the 60% Design Plans for Section 3.
- Shoulder mounted noise barriers considered reasonable and feasible at this location in the 2002 Noise Impact Report.
- The proposed 16’-tall shoulder mounted noise barriers are higher than the maximum limit of 14 feet identified in FDOT’s 2013 Plans Preparation Manual; noise barriers considered reasonable and feasible at the location in the 2003 Technical Memorandum.
- Noise barriers considered reasonable and feasible at this location in the 2002 Noise Impact Report.
- Shoulder and ground mounted noise barrier limits match those in the 60% Design Plans for Section 3.
Table 3.6  Noise Barrier Analyses for Residential Areas Located West of I-4 and between Princeton Street and Par Street - Noise Sensitive Area 3-C

<table>
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<tr>
<th>Conceptual Noise Barrier Design Number</th>
<th>Barrier Type</th>
<th>Barrier Location</th>
<th>Height (feet)</th>
<th>Length (feet)</th>
<th>Begin Station Number</th>
<th>End Station Number</th>
<th>Number of Impacted Receptor Sites</th>
<th>Average (Maximum) Noise Reduction for Impacted Receptor Sites (dB(A))</th>
<th>Number of Benefited Barrier Sites (Not Impacted)</th>
<th>Number of Benefited Receptor Sites</th>
<th>Average Noise Reduction for all Benefited Receptor Sites (dB(A))</th>
<th>Cost ($30 per square foot)</th>
<th>Average Cost/BSI Benefited</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD5-3C</td>
<td>Shoulder Mounted</td>
<td>14 Westbound Princeton Street Westbound Off Ramp D &amp; Par Street Westbound Off Ramp D on MSE Wall and Bridge Structure</td>
<td>6.0</td>
<td>3,760</td>
<td>278+00</td>
<td>315+40</td>
<td>74</td>
<td>4.7 (8.5)</td>
<td>37</td>
<td>2</td>
<td>39</td>
<td>6.6</td>
<td>$502,400</td>
<td>$23,138</td>
</tr>
<tr>
<td>CD6-3C</td>
<td>Shoulder Mounted</td>
<td>14 Westbound Princeton Street Westbound Off Ramp D &amp; Par Street Westbound On Ramp A on MSE Wall and Bridge Structure</td>
<td>6.5</td>
<td>3,760</td>
<td>278+00</td>
<td>315+40</td>
<td>74</td>
<td>5.5 (8.8)</td>
<td>61</td>
<td>9</td>
<td>62</td>
<td>6.1</td>
<td>$1,027,800</td>
<td>$17,120</td>
</tr>
<tr>
<td>CD7-3C</td>
<td>Shoulder Mounted</td>
<td>14 Westbound Princeton Street Westbound Off Ramp D &amp; Par Street Westbound On Ramp A on MSE Wall and Bridge Structure</td>
<td>6.0</td>
<td>3,760</td>
<td>278+00</td>
<td>315+40</td>
<td>74</td>
<td>4.7 (8.5)</td>
<td>63</td>
<td>17</td>
<td>70</td>
<td>6.6</td>
<td>$1,932,800</td>
<td>$19,743</td>
</tr>
<tr>
<td>CD8-3C</td>
<td>Shoulder Mounted</td>
<td>14 Westbound Princeton Street Westbound Off Ramp D &amp; Par Street Westbound On Ramp A on MSE Wall and Bridge Structure</td>
<td>6.0</td>
<td>3,450</td>
<td>280+90</td>
<td>315+40</td>
<td>48</td>
<td>6.3</td>
<td>44</td>
<td>4</td>
<td>48</td>
<td>6.3</td>
<td>$1,135,800</td>
<td>$14,899</td>
</tr>
<tr>
<td>CD9-3C</td>
<td>Shoulder Mounted</td>
<td>14 Westbound Princeton Street Westbound Off Ramp D &amp; Par Street Westbound On Ramp A on MSE Wall and Bridge Structure</td>
<td>6.0</td>
<td>3,450</td>
<td>280+90</td>
<td>315+40</td>
<td>48</td>
<td>6.3</td>
<td>44</td>
<td>4</td>
<td>48</td>
<td>6.3</td>
<td>$1,135,800</td>
<td>$14,899</td>
</tr>
<tr>
<td>CD10-3C</td>
<td>Shoulder Mounted</td>
<td>14 Westbound Princeton Street Westbound Off Ramp D &amp; Par Street Westbound On Ramp A on MSE Wall and Bridge Structure</td>
<td>6.0</td>
<td>3,450</td>
<td>280+90</td>
<td>315+40</td>
<td>48</td>
<td>6.3</td>
<td>44</td>
<td>4</td>
<td>48</td>
<td>6.3</td>
<td>$1,135,800</td>
<td>$14,899</td>
</tr>
<tr>
<td>CD11-3C</td>
<td>Shoulder Mounted</td>
<td>14 Westbound Princeton Street Westbound Off Ramp D &amp; Par Street Westbound On Ramp A on MSE Wall and Bridge Structure</td>
<td>6.0</td>
<td>3,450</td>
<td>280+90</td>
<td>315+40</td>
<td>48</td>
<td>6.3</td>
<td>44</td>
<td>4</td>
<td>48</td>
<td>6.3</td>
<td>$1,135,800</td>
<td>$14,899</td>
</tr>
<tr>
<td>CD12-3C</td>
<td>Shoulder Mounted</td>
<td>14 Westbound Princeton Street Westbound Off Ramp D &amp; Par Street Westbound On Ramp A on MSE Wall and Bridge Structure</td>
<td>6.0</td>
<td>3,450</td>
<td>280+90</td>
<td>315+40</td>
<td>48</td>
<td>6.3</td>
<td>44</td>
<td>4</td>
<td>48</td>
<td>6.3</td>
<td>$1,135,800</td>
<td>$14,899</td>
</tr>
<tr>
<td>CD13-3C</td>
<td>Shoulder Mounted</td>
<td>14 Westbound Princeton Street Westbound Off Ramp D &amp; Par Street Westbound On Ramp A on MSE Wall and Bridge Structure</td>
<td>6.0</td>
<td>3,450</td>
<td>280+90</td>
<td>315+40</td>
<td>48</td>
<td>6.3</td>
<td>44</td>
<td>4</td>
<td>48</td>
<td>6.3</td>
<td>$1,135,800</td>
<td>$14,899</td>
</tr>
</tbody>
</table>

Notes:
- Noise barriers considered reasonable and feasible at this location in the 2005 Technical Memorandum.
- Noise barriers considered reasonable and feasible at this location in the 2005 Technical Memorandum.
- Noise barriers considered reasonable and feasible at this location in the 2005 Technical Memorandum.
- Noise barriers considered reasonable and feasible at this location in the 2005 Technical Memorandum.
- Noise barriers considered reasonable and feasible at this location in the 2005 Technical Memorandum.
- Shoulder and ground mounted noise barrier fans match those in the 60% Design Phase Plan for Section 2.
### Table 3.7 Noise Barrier Analyses for Residential Areas Located East of I-4 and South of Princeton Street - Noise Sensitive Area 3-D

<table>
<thead>
<tr>
<th>Conceptual Barrier Design Number</th>
<th>Barrier Type</th>
<th>Barrier Location</th>
<th>Height (feet)</th>
<th>Length (feet)</th>
<th>Begin Station Number</th>
<th>End Station Number</th>
<th>Number of Impacted Receptor Sites</th>
<th>Number of Impacted/Not Impacted Receptor Sites (dB(A))</th>
<th>Number of Benefited Receptor Sites</th>
<th>Total Number of Benefited Receptor Sites</th>
<th>Average Noise Reduction for all Benefited Receptor Sites dB(A)</th>
<th>Cost ($30 per square foot)</th>
<th>Average Cost/Site Benefited</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD1-3D Shoulder Mounted</td>
<td>Shoulder Mounted</td>
<td>I-4 Eastbound &amp; Princeton Street Eastbound Off Ramp B on MSE Wall and Bridge Structures</td>
<td>8</td>
<td>1,820</td>
<td>257+00</td>
<td>275+00</td>
<td>22</td>
<td>1.5 (6.1)</td>
<td>1</td>
<td>27</td>
<td>28</td>
<td>6.2</td>
<td>$436,800</td>
<td>$19,600</td>
</tr>
<tr>
<td>CD2-3D Shoulder Mounted</td>
<td>Shoulder Mounted</td>
<td>I-4 Eastbound &amp; Princeton Street Eastbound Off Ramp B on MSE Wall and Bridge Structures</td>
<td>8</td>
<td>1,820</td>
<td>257+00</td>
<td>275+00</td>
<td>22</td>
<td>4.8 (6.2)</td>
<td>4</td>
<td>32</td>
<td>36</td>
<td>5.7</td>
<td>$761,600</td>
<td>$21,133</td>
</tr>
<tr>
<td>CD2-3D Shoulder Mounted</td>
<td>Shoulder Mounted</td>
<td>I-4 Eastbound Princeton Street Overpass on MSE Wall and Bridge Structure</td>
<td>8</td>
<td>1,350</td>
<td>270+50</td>
<td>284+00</td>
<td>8</td>
<td>1,940</td>
<td>247+00</td>
<td>275+90</td>
<td>29</td>
<td>&gt;5.0</td>
<td>149</td>
<td>---</td>
</tr>
<tr>
<td>CD3-3D Shoulder Mounted</td>
<td>Ground Mounted</td>
<td>Right-of-Way Line Adjacent to Eastbound Princeton Street Off Ramp B</td>
<td>16</td>
<td>485</td>
<td>270+55</td>
<td>275+60</td>
<td>18</td>
<td>490</td>
<td>270+70</td>
<td>275+60</td>
<td>---</td>
<td>13,700</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>CD4-3D Shoulder Mounted</td>
<td>Ground Mounted</td>
<td>Right-of-Way Line Adjacent to Eastbound Princeton Street Off Ramp B</td>
<td>16</td>
<td>485</td>
<td>270+55</td>
<td>275+60</td>
<td>18</td>
<td>490</td>
<td>270+70</td>
<td>275+60</td>
<td>---</td>
<td>13,700</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

**Comments**
- Shoulder and ground mounted noise barrier limits match those in the 60% Design Plan for Section 3; Recommended for further consideration and public input.
- Noise barriers considered reasonable and feasible at this location in the 2005 Technical Memorandum.

---

- Noise barriers considered reasonable and feasible at this location in the 2005 Technical Memorandum.

---

Conceptual noise barrier design that meets FDOT's reasonable cost criteria and noise reduction design goal of at least a 7.0 dB(A) reduction for at least one impacted receptor site; Noise barrier recommended for further consideration and public input.

---

**Note:**
- CD1-3D refers to Station Range/General Location
- CD2-3D refers to Conceptual Barrier Design Number
- CD3-3D refers to Shoulder Mounted and Ground Mounted Barrier Combination Alternatives
- CD4-3D refers to Shoulder Mounted and Ground Mounted Barrier Combination Alternatives

---

**Table Notes:**
- Heights and lengths are approximate and subject to engineering review.
- Average noise reduction is for impacted receptor sites.
- Cost is based on $30 per square foot.
- Comments note specific considerations or recommendations for further evaluation.
### Table 3.8 Noise Barrier Analyses for Residential Areas Located West of I-4 between Par Street and Fairbanks Avenue - Noise Sensitive Area 3-E

<table>
<thead>
<tr>
<th>Conceptual Barrier Design Number</th>
<th>Barier Type</th>
<th>Barrier Location</th>
<th>Number of Impacted Receptor Sites</th>
<th>Number of Impacted/ Benefited Receptor Sites Not Impacted</th>
<th>Total Number of Benefited Receptor Sites</th>
<th>Average Noise Reduction for all Benefited Receptor Sites (dB(A))</th>
<th>Cost ($30 per square foot)</th>
<th>Average Cost/Site Benefited</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD1-3E Shoulder Mounted</td>
<td>Shoulder Mounted</td>
<td>1-4 Westbound &amp; Fairbanks Avenue Westbound On Ramp A on MSE Wall and Bridge Structures</td>
<td>8 3,050 313+00 362+80</td>
<td>105 5.2 (8.5)</td>
<td>59 0 59</td>
<td>6</td>
<td>$1,212,000</td>
<td>$20,542</td>
<td>---</td>
</tr>
<tr>
<td>CD2-3E Shoulder Mounted</td>
<td>Shoulder Mounted</td>
<td>1-4 Westbound &amp; Fairbanks Avenue Westbound On Ramp A on MSE Wall and Bridge Structures</td>
<td>8 5,050 313+00 363+80</td>
<td>105 5.4 (8.5)</td>
<td>66 0 66</td>
<td>6</td>
<td>$1,300,000</td>
<td>$20,909</td>
<td>---</td>
</tr>
<tr>
<td>CD3-3E Shoulder Mounted</td>
<td>Shoulder Mounted</td>
<td>1-4 Westbound &amp; Fairbanks Avenue Westbound On Ramp A on MSE Wall and Bridge Structures</td>
<td>8 700 357+00 364+00</td>
<td>105 7.8 (13.0)</td>
<td>101 6</td>
<td>107</td>
<td>8.0</td>
<td>$1,873,920</td>
<td>$17,513</td>
</tr>
<tr>
<td>CD4-3E Shoulder Mounted</td>
<td>Shoulder Mounted</td>
<td>1-4 Westbound &amp; Fairbanks Avenue Westbound On Ramp A on MSE Wall and Bridge Structures</td>
<td>8 200 315+00 3,050</td>
<td>105 8.1 (13.0)</td>
<td>103 6</td>
<td>107</td>
<td>8.0</td>
<td>$1,969,920</td>
<td>$18,073</td>
</tr>
<tr>
<td>CD5-3E Shoulder Mounted</td>
<td>Shoulder Mounted</td>
<td>1-4 Westbound &amp; Fairbanks Avenue Westbound On Ramp A on MSE Wall and Bridge Structures</td>
<td>8 3,050 313+00 362+80</td>
<td>105 8.1 (13.0)</td>
<td>103 8</td>
<td>111</td>
<td>8.0</td>
<td>$2,017,920</td>
<td>$18,179</td>
</tr>
<tr>
<td>CD6-3E Shoulder Mounted</td>
<td>Shoulder Mounted</td>
<td>1-4 Westbound &amp; Fairbanks Avenue Westbound On Ramp A on MSE Wall and Bridge Structures</td>
<td>8 3,050 313+00 362+80</td>
<td>105 8.1 (13.0)</td>
<td>103 8</td>
<td>111</td>
<td>8.0</td>
<td>$2,017,920</td>
<td>$18,179</td>
</tr>
</tbody>
</table>

Conceputal noise barrier design that meets FDOT’s reasonable cost criteria and noise reduction design goal of at least a 7.0 dB(A) reduction for at least one impacted receptor site; Noise barrier recommended for further consideration and public input.
| Noise Sensitive Area (Station Range/General Location) | Conceptual Barrier Design Number | Barrier Type | Barrier Location | Height (feet) | Length (feet) | Begin Station Number | End Station Number | Number of Impacted Receptor Sites | Average (Maximum) Noise Reduction for Impacted Receptor Sites dB(A) | Number of Impacted/Benefited Receptor Sites | Number of Benefited Receptor Sites/Not Impacted | Total Number of Benefited Receptor Sites | Average Noise Reduction for all Benefited Receptor Sites dB(A) | Cost ($30 per square foot) | Average Cost/Site Benefited | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shoulder Mounted Barrier Alternatives | CD2-3F | Shoulder Mounted | 1-4 Eastbound & Fairbanks Avenue Eastbound Off Ramp B on MSE Wall and Bridge Structure | 8 | 1,750 | 343+20 | 360+70 | 30 | 4.0 (5.8) | 9 | 0 | 9 | 5.6 | $420,000 | $46,667 | --- | --- | --- |
| | CD2-3F | Shoulder Mounted - Segment 1 | 1-4 Eastbound & Fairbanks Avenue Eastbound Off Ramp B on MSE Wall and Bridge Structure | 8 | 1,750 | 343+20 | 360+70 | 30 | 6.6 (9.3) | 29 | 2 | 31 | 6.9 | $732,000 | $23,613 | --- | --- | --- |
| | CD2-3F | Shoulder Mounted - Segment 2 | 1-4 Eastbound Fairbanks Avenue Overpass on MSE Wall and Bridge Structure | 8 | 1,300 | 351+00 | 364+00 | 30 | 5.4 (7.5) | 20 | 1 | 27 | 5.8 | $624,000 | $23,111 | --- | --- | --- |
| | CD3-3F | Shoulder Mounted | 1-4 Eastbound Fairbanks Avenue Overpass on MSE Wall and Bridge Structure | 8 | 850 | 355+50 | 364+00 | 30 | 6.5 (8.7) | 27 | 3 | 30 | 6.8 | $666,000 | $22,200 | --- | --- | --- |
| | CD4-3F | Shoulder Mounted | 1-4 Eastbound on Bridge Structure | 8 | 360 | 343+30 | 346+90 | 30 | 7.1 (9.6) | 30 | 5 | 35 | 7.1 | $762,000 | $21,771 | Recommended for further consideration and public input; Provides benefits to all impacted receptor sites | --- | --- | --- |
| | CD5-3F | Shoulder Mounted | 1-4 Eastbound Fairbanks Avenue Eastbound Off Ramp B on MSE Wall | 14 | 1,380 | 346+90 | 360+70 | 30 | 7.1 (9.6) | 30 | 5 | 35 | 7.1 | $762,000 | $21,771 | Recommended for further consideration and public input; Provides benefits to all impacted receptor sites | --- | --- | --- |
| | CD5-3F | Shoulder Mounted | 1-4 Eastbound on Bridge Structure | 8 | 360 | 343+30 | 346+90 | 30 | 7.1 (9.6) | 30 | 5 | 35 | 7.1 | $762,000 | $21,771 | Recommended for further consideration and public input; Provides benefits to all impacted receptor sites | --- | --- | --- |

---

Conceptual noise barrier design that meets FDOT’s reasonable cost criteria and noise reduction design goal of at least a 7.0 dB(A) reduction for at least one impacted receptor site; Noise barrier recommended for further consideration and public input.
## Table 3.10 Noise Barrier Analyses for Residential Areas Located West of I-4 between Wymore Road and SR 436 (Altamonte Drive) - Noise Sensitive Area 4-C

<table>
<thead>
<tr>
<th>Shoulder Mounted Barrier Alternatives</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CD1-4C Shoulder Mounted I-4 Westbound on MSE/Retaining Walls</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>6.160</td>
</tr>
<tr>
<td>14</td>
<td>6.160</td>
</tr>
</tbody>
</table>

--- Ground Mounted I-4 Westbound on MSE/Retaining Wall 17.8 (Average) 5,450 — — — — — 193 — $1,940,200 $10,053 Noise barriers considered reasonable and feasible at this location in the 2009 Noise Study Report Update.

## I-4 PD&E Noise Study Report Section 2 dated August 2002 Noise Sensitive Area 4-C

### Overall Length of Barrier(s)

- **Total Number of Benefited Receptor Sites**: 250
- **Average Noise Reduction for all Benefited Receptor Sites (dB(A))**: 7.0
- **Cost ($30 per square foot)**: $1,940,200
- **Average Cost/Site Benefited**: $10,053
- **Comments**: Noise barriers considered reasonable and feasible at this location in the 2002 Noise Impact Report.

### Shoulder Mounted Barrier Alternatives

- **Shoulder Mounted Segment 1**: I-4 Westbound on Retaining Wall 14 2,180 549+00 560+50 280 — 290 72 322 7.0 — — The proposed 18'-tall shoulder mounted noise barriers are higher than the maximum limit of 14 feet identified in FDOT's 2013 Plans Preparation Manual; Noise barriers considered reasonable and feasible at this location in the 2009 Noise Study Report Update.

- **Shoulder Mounted Segment 2**: I-4 Westbound on Retaining Wall 18 600 560+60 575+60 — — — — — — — —

- **Shoulder Mounted Segment 3**: I-4 Westbound on Retaining and MSE Walls 14 3,122 575+40 606+85 — — — — — — — —

- **Overall Length of Barrier(s)**: 5,882 247+00 275+80

Conceptual noise barrier design that meets FDOT's reasonable cost criteria and noise reduction design goal of at least a 7.0 dB(A) reduction for at least one impacted receptor site; Noise barrier recommended for further consideration and public input.
angeas, and General Location)

<table>
<thead>
<tr>
<th>Shoulder Mounted Barrier Alternatives for Lakeshore Landings Mobile Home Park</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Barrier Location</strong></td>
</tr>
<tr>
<td>CD1-2AA</td>
</tr>
<tr>
<td>CD2-2AA</td>
</tr>
</tbody>
</table>

During the PD&E Study, noise barriers were not cost reasonable at this location (i.e., exceeded $30,000 per benefitted site) and were not recommended for further consideration and public input.


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>Ground Mounted</td>
<td>-4 South Right-of-Way Line</td>
<td>18</td>
<td>2,500</td>
<td>---</td>
<td>---</td>
<td>36</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>26</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

Conceptual noise barrier design that meets FDOT’s reasonable cost criteria and noise reduction design goal of at least a 7.0 dB(A) reduction for at least one impacted receptor site; Noise barrier recommended for further consideration and public input.
### Table 3.12  Noise Barrier Analyses for Residential Areas Located North of I-4 and East of John Young Parkway - Noise Sensitive Area 2-BB

| Conceptual Barrier Design Number | Barrier Type | Barrier Location | Height (feet) | Length (feet) | Begin Station Number | End Station Number | Number of Impacted Receptor Sites | Average (Maximum) Noise Reduction for Impacted Receptor Sites dB(A) | Number of Impacted/Benefited Receptor Sites | Number of Benefited Receptor Sites | Total Number of Benefited Receptor Sites | Average Noise Reduction for all Benefited Receptor Sites dB(A) | Cost ($30 per square foot) | Average Cost/Site Benefited | Comments |
|---------------------------------|--------------|------------------|---------------|---------------|----------------------|-------------------|-------------------------------|------------------------------------------------|---------------------------------|-------------------------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|------------------------------|----------|
| CD1-2BB                         | Shoulder Mounted | I-4 Westbound Outside Shoulder on Fill and MSE/Retaining Wall | 8             | 2,660        | 1144+70            | 1173+00          | 37                            | 5.4 (7.0)                          | 29                              | 11                            | 40                            | 5.8                               | $686,400                     | $17,160                      | —       |
| CD2-2BB                         | Shoulder Mounted | I-4 Westbound Outside Shoulder on Fill and MSE/Retaining Wall | 8             | 1,680        | 1144+70            | 1161+50          | 37                            | 6.2 (8.5)                          | 30                              | 21                            | 51                            | 8.5                                | $444,200                     | $16,553                      | —       |
| CD3-2BB                         | Shoulder Mounted | I-4 Westbound Outside Shoulder on Fill and MSE/Retaining Wall | 14            | 1,050        | 1101+50            | 1172+00          | 37                            | 7.1 (8.8)                          | 32                              | 24                            | 56                            | 7.2                                | $1,159,200                   | $20,700                      | Recommended for further consideration and public input |

**John Young Parkway/I-4 Interchange PD&E Noises Study Report dated August 1996**

| -- | Ground Mounted | I-4 North Right-of-Way Line | 20            | 2,900        | —                   | —                | 25                            | —                                | —                              | 18                            | —                              | $1,023,696                     | $56,872                      | During the PD&E Study, noise barriers were not cost reasonable at this location (i.e., exceeded $30,000 per benefitted site) and were not recommended for further consideration and public input |

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Conceptual noise barrier design that meets FDOT's reasonable cost criteria and noise reduction design goal of at least a 7.0 dB(A) reduction for at least one impacted receptor site; Noise barrier recommended for further consideration and public input.
Table 3.13 Noise Barrier Analyses for Residential Areas Located North of I-4 and West of Rio Grande Avenue - Noise Sensitive Area 2-B

<table>
<thead>
<tr>
<th>Conceptual Barrier Design Number</th>
<th>Barrier Type</th>
<th>Barrier Location</th>
<th>Height (feet)</th>
<th>Length (feet)</th>
<th>Begin Station Number</th>
<th>End Station Number</th>
<th>Number of Impacted Receiver Sites</th>
<th>Average (Maximum) Noise Reduction for Impacted Receiver Sites dB(A)</th>
<th>Number of Benefited Receiver Sites</th>
<th>Cost ($30 per square foot)</th>
<th>Average Cost/Site Benefited</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoulder Mounted Barrier Alternatives for Rio Grande Subdivision and Royal Summit Apartments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD1-2B Shoulder Mounted</td>
<td>I-4 Westbound Outside Shoulder on Fill, MSE/Retaining Wall, and Bridge Structure</td>
<td>8</td>
<td>1,800</td>
<td>1180+50</td>
<td>1188+50</td>
<td>69</td>
<td>5.3 (6.0)</td>
<td>57</td>
<td>3</td>
<td>60</td>
<td>5.9</td>
<td>$432,000</td>
</tr>
<tr>
<td>CD2-2B Shoulder Mounted</td>
<td>I-4 Westbound Outside Shoulder on Fill and MSE/Retaining Wall</td>
<td>14</td>
<td>1,400</td>
<td>1181+00</td>
<td>1185+00</td>
<td>69</td>
<td>7.1 (11.1)</td>
<td>83</td>
<td>10</td>
<td>73</td>
<td>8.1</td>
<td>$672,000</td>
</tr>
<tr>
<td>I-4 Westbound Outside Shoulder on Bridge Structure and MSE Wall</td>
<td>8</td>
<td>350</td>
<td>1193+00</td>
<td>1198+50</td>
<td>69</td>
<td>7.1 (11.1)</td>
<td>83</td>
<td>10</td>
<td>73</td>
<td>8.1</td>
<td>$672,000</td>
<td>$9,205</td>
</tr>
</tbody>
</table>

Noise Sensitive Area 2-B (Stations 1182+00 to 1185+00; North of I-4)

—— Ground Mounted | I-4 North Right-of-Way Line | 17.4 (Average) | 3,295 | — | — | 49 | — | — | — | 7 | — | $1,148,660 | $103,800 | During the PD&E Study, noise barriers were not cost reasonable at this location (i.e., exceeded $20,000 per benefitted site) and were not recommended for further consideration and public input |

Conceptual noise barrier design that meets FDOT’s reasonable cost criteria and noise reduction design goal of at least a 7.0 dB(A) reduction for at least one impacted receiver site; Noise barrier recommended for further consideration and public input.
<table>
<thead>
<tr>
<th>Barrier Location</th>
<th>Height (feet)</th>
<th>Length (feet)</th>
<th>Begin Station Number</th>
<th>End Station Number</th>
<th>Number of Impacted Receptor Sites</th>
<th>Number of Impacted Receptor Sites dB(A)</th>
<th>Number of Benefited Receptor Sites Not Impacted</th>
<th>Number of Benefited Receptor Sites</th>
<th>Total Number of Benefited Receptor Sites</th>
<th>Average Noise Reduction for all Benefited Receptor Sites dB(A)</th>
<th>Cost ($30 per square foot)</th>
<th>Average Cost/Site Benefited</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD1-3G Shoulder Mounted</td>
<td>8</td>
<td>1,980</td>
<td>378+00</td>
<td>388+50</td>
<td>7</td>
<td>5.4 (5.7)</td>
<td>7</td>
<td>13</td>
<td>20</td>
<td>5.4</td>
<td>$475,200</td>
<td>$23,760</td>
<td>Recommended for further consideration and public input; Noise barrier limits covers most of the residential community</td>
</tr>
<tr>
<td>CD2-3G Shoulder Mounted</td>
<td>14</td>
<td>2,500</td>
<td>379+00</td>
<td>404+00</td>
<td>7</td>
<td>5.5 (5.8)</td>
<td>7</td>
<td>14</td>
<td>21</td>
<td>5.4</td>
<td>$600,000</td>
<td>$28,571</td>
<td></td>
</tr>
<tr>
<td>CD3-3G Shoulder Mounted</td>
<td>14</td>
<td>1,215</td>
<td>385+00</td>
<td>397+00</td>
<td>7</td>
<td>6.8 (7.8)</td>
<td>7</td>
<td>5</td>
<td>12</td>
<td>6.3</td>
<td>$510,300</td>
<td>$42,525</td>
<td></td>
</tr>
<tr>
<td>CD4-3G Shoulder Mounted</td>
<td>14</td>
<td>500</td>
<td>385+00</td>
<td>390+00</td>
<td>7</td>
<td>6.4 (7.1)</td>
<td>7</td>
<td>4</td>
<td>11</td>
<td>6.0</td>
<td>$493,600</td>
<td>$38,873</td>
<td></td>
</tr>
<tr>
<td>CD5-3G Ground Mounted</td>
<td>22</td>
<td>1,380</td>
<td>282+00</td>
<td>295+00</td>
<td>7</td>
<td>5.5 (6.1)</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>9.1</td>
<td>$910,800</td>
<td>$130,114</td>
<td></td>
</tr>
<tr>
<td>— Ground Mounted</td>
<td>22</td>
<td>3,020</td>
<td>—</td>
<td>—</td>
<td>31</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>30</td>
<td>—</td>
<td>$1,328,800</td>
<td>$44,293</td>
<td>During the PD&amp;E Study, noise barriers were not cost reasonable at this location (i.e., exceeded $30,000 per benefitted site) and were not recommended for further consideration and public input</td>
</tr>
</tbody>
</table>

**Comments:**

- **Shoulder Mounted Barrier Alternatives**
- **Ground Mounted Barrier Alternatives**

---

**Table 3.14 Noise Barrier Analyses for Residential Areas Located West of I-4 and North of Fairbanks Avenue - Noise Sensitive Area 3-G**

- No residences identified as impacted by traffic noise. Noise barriers were not considered for this area; I-4 is elevated through this segment approximately 20 higher feet higher than the surrounding residences.
### Table 3.15 Noise Barrier Analyses for Residential Areas Located East of I-4 and North of Fairbanks Avenue - Noise Sensitive Area 3-H

<table>
<thead>
<tr>
<th>Conceptual Barrier Design Number</th>
<th>Shoulder Mounted Barrier Alternatives</th>
<th>Barrier Location</th>
<th>Height (ft)</th>
<th>Length (ft)</th>
<th>Begin Guardrail Design</th>
<th>Guardrail Design</th>
<th>Number of Impacted Receptor Sites (Barriers)</th>
<th>Average Noise Reduction for Impacted Receptor Sites (dB(A))</th>
<th>Number of Benefited Receptor Sites</th>
<th>Total Number of Benefited Receptor Sites</th>
<th>Cost ($30 per square foot)</th>
<th>Average Cost/Sites Benefited</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD1-3H</td>
<td>E-Shoulder Mounted Barriers</td>
<td>Barrier Location</td>
<td>5.0</td>
<td>12.0</td>
<td>363+70</td>
<td>362+00</td>
<td>363+70</td>
<td>5.6</td>
<td>28</td>
<td>1</td>
<td>$679,200</td>
<td>$24,431</td>
<td></td>
</tr>
<tr>
<td>CD2-3H</td>
<td>E-Shoulder Mounted Barriers</td>
<td>Barrier Location</td>
<td>5.3</td>
<td>12.0</td>
<td>363+70</td>
<td>362+00</td>
<td>363+70</td>
<td>5.6</td>
<td>32</td>
<td>3</td>
<td>$711,200</td>
<td>$24,177</td>
<td></td>
</tr>
<tr>
<td>CD3-3H</td>
<td>E-Shoulder Mounted Barriers</td>
<td>Barrier Location</td>
<td>5.5</td>
<td>12.0</td>
<td>363+70</td>
<td>362+00</td>
<td>363+70</td>
<td>5.6</td>
<td>28</td>
<td>1</td>
<td>$685,200</td>
<td>$24,241</td>
<td></td>
</tr>
<tr>
<td>CD4-3H</td>
<td>E-Shoulder Mounted Barriers</td>
<td>Barrier Location</td>
<td>5.7</td>
<td>12.0</td>
<td>363+70</td>
<td>362+00</td>
<td>363+70</td>
<td>5.6</td>
<td>32</td>
<td>3</td>
<td>$707,200</td>
<td>$24,177</td>
<td></td>
</tr>
<tr>
<td>CD5-3H</td>
<td>E-Shoulder Mounted Barriers</td>
<td>Barrier Location</td>
<td>5.9</td>
<td>12.0</td>
<td>363+70</td>
<td>362+00</td>
<td>363+70</td>
<td>5.6</td>
<td>28</td>
<td>1</td>
<td>$679,200</td>
<td>$24,431</td>
<td></td>
</tr>
<tr>
<td>CD6-3H</td>
<td>E-Shoulder Mounted Barriers</td>
<td>Barrier Location</td>
<td>6.0</td>
<td>12.0</td>
<td>363+70</td>
<td>362+00</td>
<td>363+70</td>
<td>5.6</td>
<td>32</td>
<td>3</td>
<td>$711,200</td>
<td>$24,177</td>
<td></td>
</tr>
<tr>
<td>CD7-3H</td>
<td>E-Shoulder Mounted Barriers</td>
<td>Barrier Location</td>
<td>6.1</td>
<td>12.0</td>
<td>363+70</td>
<td>362+00</td>
<td>363+70</td>
<td>5.6</td>
<td>28</td>
<td>1</td>
<td>$685,200</td>
<td>$24,241</td>
<td></td>
</tr>
<tr>
<td>CD8-3H</td>
<td>E-Shoulder Mounted Barriers</td>
<td>Barrier Location</td>
<td>6.1</td>
<td>12.0</td>
<td>363+70</td>
<td>362+00</td>
<td>363+70</td>
<td>5.6</td>
<td>32</td>
<td>3</td>
<td>$707,200</td>
<td>$24,177</td>
<td></td>
</tr>
</tbody>
</table>

**Noise Sensitive Area 3-H (Sections 363+00 to 356+00, East of I-4)**

**Noise Barrier Limitations**

- The proposed 16'-tall shoulder mounted noise barriers are higher than the maximum limit of 14 feet identified in FDOT's 2013 Plans Preparation Manual; Noise barriers considered reasonable and feasible at this location in the 2005 Technical Memorandum. **Recommended for further consideration and public input.**
### Table 3.16 Noise Barrier Analyses for Residential Areas Located East of I-4 and North of Wymore Road - Noise Sensitive Area 4-D

<table>
<thead>
<tr>
<th>Conceptual Barrier Design Number</th>
<th>Barrier Type</th>
<th>Barrier Location</th>
<th>Height (feet)</th>
<th>Length (feet)</th>
<th>Begin Station Number</th>
<th>End Station Number</th>
<th>Number of Impacted Receiver Sites</th>
<th>Number of Impacted/ Benefited Receiver Sites Not Impacted</th>
<th>Total Number of Benefited Receiver Sites</th>
<th>Average Noise Reduction for all Benefited Receiver Sites dB(A)</th>
<th>Cost ($30 per square foot)</th>
<th>Average Cost/ Site Benefited</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD1-4D</td>
<td>Shoulder Mounted</td>
<td>I-4 Westbound on Retaining and MSE Walls</td>
<td>8</td>
<td>1,800</td>
<td>549+00</td>
<td>567+00</td>
<td>6</td>
<td>2.5 (3.3)</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
<td>$432,000</td>
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<td></td>
<td>Exceeds FDOT's Reasonable Cost Criteria of $42,000 per benefited receptor site. Noise barrier not recommended for further consideration and public input.</td>
</tr>
<tr>
<td>CD2-4D</td>
<td>Shoulder Mounted</td>
<td>I-4 Westbound on Retaining and MSE Walls</td>
<td>14</td>
<td>1,600</td>
<td>549+00</td>
<td>567+00</td>
<td>6</td>
<td>4.6 (5.0)</td>
<td>1</td>
<td>0</td>
<td>1.0</td>
<td>$756,000</td>
<td>$756,000</td>
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<td></td>
<td>Exceeds FDOT's Reasonable Cost Criteria of $42,000 per benefited receptor site. Noise barrier not recommended for further consideration and public input.</td>
</tr>
<tr>
<td>CD3-4D</td>
<td>Ground Mounted</td>
<td>I-4 East Right-of-Way Line</td>
<td>16</td>
<td>1,400</td>
<td>552+00</td>
<td>566+00</td>
<td>6</td>
<td>4.9 (5.1)</td>
<td>1</td>
<td>0</td>
<td>1.0</td>
<td>$672,000</td>
<td>$672,000</td>
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<td></td>
<td>Exceeds FDOT's Reasonable Cost Criteria of $42,000 per benefited receptor site. Noise barrier not recommended for further consideration and public input.</td>
</tr>
<tr>
<td>CD4-4D</td>
<td>Ground Mounted</td>
<td>I-4 East Right-of-Way Line</td>
<td>18</td>
<td>1,400</td>
<td>552+00</td>
<td>566+00</td>
<td>6</td>
<td>5.6 (5.9)</td>
<td>6</td>
<td>1</td>
<td>7.0</td>
<td>$756,000</td>
<td>$108,000</td>
</tr>
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<td></td>
<td>Exceeds FDOT's Reasonable Cost Criteria of $42,000 per benefited receptor site. Noise barrier not recommended for further consideration and public input.</td>
</tr>
<tr>
<td>CD5-4D</td>
<td>Ground Mounted</td>
<td>I-4 East Right-of-Way Line</td>
<td>20</td>
<td>1,400</td>
<td>552+00</td>
<td>566+00</td>
<td>6</td>
<td>6.2 (6.4)</td>
<td>6</td>
<td>1</td>
<td>7.2</td>
<td>$940,000</td>
<td>$120,000</td>
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<td></td>
<td>Exceeds FDOT's Reasonable Cost Criteria of $42,000 per benefited receptor site. Noise barrier not recommended for further consideration and public input.</td>
</tr>
<tr>
<td>CD6-4D</td>
<td>Ground Mounted</td>
<td>I-4 East Right-of-Way Line</td>
<td>22</td>
<td>1,400</td>
<td>552+00</td>
<td>566+00</td>
<td>6</td>
<td>6.7 (7.2)</td>
<td>6</td>
<td>2</td>
<td>8.6</td>
<td>$924,000</td>
<td>$115,500</td>
</tr>
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<td></td>
<td>Exceeds FDOT's Reasonable Cost Criteria of $42,000 per benefited receptor site. Noise barrier not recommended for further consideration and public input.</td>
</tr>
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</tr>
</tbody>
</table>

**Comments:**

- **Ground Mounted I-4 East Right-of-Way Line**
  - 18.6 (Average)
  - 2,850
  - 85

During the PD&E Study, noise barriers were not cost reasonable at this location and were not recommended for further consideration and public input.

Conceptual noise barrier design that does not meet FDOT's reasonable cost criteria and noise reduction design goal of at least a 7.0 dB(A) reduction for at least one impacted receptor site; Noise barrier not recommended for further consideration and public input.
### Table 3.17 Noise Barrier Analyses for Residential Areas Located East of I-4 between Central Parkway and SR 434 - Noise Sensitive Area 4-G

<table>
<thead>
<tr>
<th>Conceptual Noise Barrier Design Number</th>
<th>Barrier Location</th>
<th>Height (feet)</th>
<th>Length (feet)</th>
<th>Begin Station Number</th>
<th>End Station Number</th>
<th>Number of Impacted/Benefited Receiver Sites</th>
<th>Number of Impacted/Not Impacted Receiver Sites</th>
<th>Average Noise Reduction for Impacted Receiver Sites (dB(A))</th>
<th>Number of Impacted/Not Impacted Receiver Sites</th>
<th>Total Number of Benefited Receiver Sites</th>
<th>Average Noise Reduction for all Benefited Receiver Sites (dB(A))</th>
<th>Cost ($30 per square foot)</th>
<th>Average Cost/Site Benefited</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD1-4G Shoulder Mounted</td>
<td>I-4 Eastbound on MSE/Retaining Walls</td>
<td>8</td>
<td>5,850</td>
<td>660+50</td>
<td>719+00</td>
<td>72</td>
<td>6.2 (9.8)</td>
<td>37</td>
<td>15</td>
<td>72</td>
<td>6.6</td>
<td>$1,404,000</td>
<td>$19,500</td>
<td>---</td>
</tr>
<tr>
<td>CD2-4G Shoulder Mounted</td>
<td>I-4 Eastbound on MSE/Retaining Walls</td>
<td>14</td>
<td>2,050</td>
<td>660+50</td>
<td>681+00</td>
<td>72</td>
<td>1.3 (9.6)</td>
<td>72</td>
<td>34</td>
<td>106</td>
<td>8.7</td>
<td>$2,394,000</td>
<td>$32,595</td>
<td>Minimum length of noise barriers to provide benefit to all of the impacted sites</td>
</tr>
<tr>
<td>CD2-4G Shoulder Mounted</td>
<td>I-4 Eastbound on MSE/Retaining Walls</td>
<td>14</td>
<td>3,650</td>
<td>683+00</td>
<td>719+50</td>
<td>72</td>
<td>10.0 (13.7)</td>
<td>72</td>
<td>38</td>
<td>110</td>
<td>9.0</td>
<td>$2,478,000</td>
<td>$32,927</td>
<td>Recommended for further consideration and public input</td>
</tr>
<tr>
<td>CD3-4G Shoulder Mounted</td>
<td>I-4 Eastbound on MSE/Retaining Walls</td>
<td>14</td>
<td>5,900</td>
<td>660+50</td>
<td>719+50</td>
<td>72</td>
<td>10.0 (13.7)</td>
<td>72</td>
<td>38</td>
<td>110</td>
<td>9.0</td>
<td>$2,478,000</td>
<td>$32,927</td>
<td>Recommended for further consideration and public input</td>
</tr>
</tbody>
</table>

**Shoulder Mounted Barrier Alternatives**

**Ground Mounted and Shoulder Mounted**

- I-4 Eastbound Shoulder and Eastern Right-of-Way Line
  - Average Height: 16.6 (Average)
  - Length: 7,400
  - Number of Impacted/Benefited Receiver Sites: 73
  - Average Noise Reduction for all Benefited Receiver Sites: 7.6
  - Cost: $2,458,800
  - Average Cost/Site Benefited: $33,655

*During the PD&E Study, noise barriers were not cost reasonable at this location and were not recommended for further consideration and public input.*

**Conceptual noise barrier design that meets FDOT’s reasonable cost criteria and noise reduction design goal of at least a 7.0 dB(A) reduction for at least one impacted receptor site; Noise barrier recommended for further consideration and public input.**
Table 3.18 Noise Barrier Analyses for Residential Areas Located East of I-4 and North of SR 434 - Noise Sensitive Area 4-I

<table>
<thead>
<tr>
<th>Noise Sensitive Area (Station Range General Location)</th>
<th>Conceptual Barrier Design Number</th>
<th>Barrier Type</th>
<th>Barrier Location</th>
<th>Height (feet)</th>
<th>Length (feet)</th>
<th>Begin Station Number</th>
<th>End Station Number</th>
<th>Number of Impacted/ Benefited Receiver Sites</th>
<th>Average (Maximum) Noise Reduction for Impacted Receiver Sites dB(A)</th>
<th>Number of Benefited Receiver Sites</th>
<th>Number of Benefited Receiver Sites/ Not Impacted</th>
<th>Total Number of Benefited Receiver Sites</th>
<th>Average Noise Reduction for all Benefited Receiver Sites dB(A)</th>
<th>Cost ($30 per square foot)</th>
<th>Average Cost/Site Benefited</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-4 Ultimate Project with Existing Ground Mounted Noise Barrier for Springwood Village Community (Southern End of Noise Sensitive Area 4-I)</td>
<td>--- Ground Mounted (Existing Limits)</td>
<td>I-4 Eastbound Right-of-Way Line</td>
<td>10</td>
<td>600</td>
<td>737+15</td>
<td>747+30</td>
<td>12</td>
<td>9.7 (13.9)</td>
<td>8</td>
<td>64</td>
<td>72</td>
<td>9.3</td>
<td>--- ---</td>
<td>--- ---</td>
<td>Four residences with second floor balconies not benefited by existing 18'-tall ground mounted noise barrier</td>
<td></td>
</tr>
<tr>
<td>Reference Design Plans (Section 6) - Proposed Removal and Replacement of 600 feet of Existing 18-Foot-Tall Ground Mounted Noise Barrier with Shoulder Mounted Barrier Alternatives</td>
<td>CD1-4I Shoulder Mounted</td>
<td>I-4 Eastbound on Retaining and MSE Walls</td>
<td>8</td>
<td>1,160</td>
<td>738+40</td>
<td>748+00</td>
<td>12</td>
<td>2.8 (4.3)</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>5.3</td>
<td>--- ---</td>
<td>$278,400</td>
<td>$136,200</td>
<td>60' of existing 18'-tall ground mounted noise barrier replaced with 1,160 feet of 8'-tall shoulder mounted barrier; Benefits 2 of the 12 impacted residences</td>
</tr>
<tr>
<td>CD2-4I Shoulder Mounted</td>
<td>I-4 Eastbound on Retaining and MSE Walls</td>
<td>14</td>
<td>1,160</td>
<td>738+40</td>
<td>748+00</td>
<td>12</td>
<td>7.1 (10.1)</td>
<td>6</td>
<td>56</td>
<td>62</td>
<td>6.9</td>
<td>--- ---</td>
<td>$167,200</td>
<td>$81,200</td>
<td>60' of existing 18'-tall ground mounted noise barrier replaced with 1,160 feet of 14'-tall shoulder mounted barrier; Benefits 6 of 12 impacted residences</td>
<td></td>
</tr>
<tr>
<td>I-4 Ultimate Project Preliminary Design Plans - Proposed Removal of 68 feet of Existing 18-Foot-Tall Ground-Mounted Noise Barrier and Shoulder Mounted Barrier Replacement Alternatives</td>
<td>CD3-4I Ground Mounted (Existing Limits)</td>
<td>I-4 Eastbound Right-of-Way Line</td>
<td>10</td>
<td>80 (Removed)</td>
<td>737+15</td>
<td>737+75</td>
<td>12</td>
<td>8.8 (13.9)</td>
<td>6</td>
<td>64</td>
<td>70</td>
<td>9.2</td>
<td>--- ---</td>
<td>--- ---</td>
<td>60' of existing 18'-tall ground mounted noise barrier removed and not replaced; Decreases the number of impacted/benefited sites by 2 residences from 5 to 3</td>
<td></td>
</tr>
<tr>
<td>CD4-4I Shoulder Mounted</td>
<td>I-4 Eastbound on Retaining and MSE Walls</td>
<td>8</td>
<td>500</td>
<td>733+20</td>
<td>738+35</td>
<td>12</td>
<td>9.2 (13.9)</td>
<td>8</td>
<td>64</td>
<td>72</td>
<td>9.2</td>
<td>--- ---</td>
<td>$120,000</td>
<td>$15,000</td>
<td>60' of existing 18'-tall ground mounted noise barrier replaced with 8'-tall shoulder mounted barrier; Benefits 8 of the 12 impacted residences</td>
<td></td>
</tr>
<tr>
<td>CD5-4I Ground Mounted (Existing Limits)</td>
<td>I-4 Eastbound Right-of-Way Line</td>
<td>10</td>
<td>80 (Removed)</td>
<td>737+15</td>
<td>737+75</td>
<td>12</td>
<td>10.4 (13.9)</td>
<td>12</td>
<td>64</td>
<td>76</td>
<td>9.2</td>
<td>--- ---</td>
<td>$189,000</td>
<td>$15,750</td>
<td>60' of existing 18'-tall ground mounted noise barrier replaced with 14'-tall shoulder mounted barrier; Benefits all 12 impacted residences; Recommended for further consideration and public input</td>
<td></td>
</tr>
<tr>
<td>Supplemental Barrier Alternatives - Segments of the Existing Noise Barrier Not Relocated</td>
<td>CD6-4I Shoulder Mounted</td>
<td>I-4 Eastbound on Retaining and MSE Walls</td>
<td>8</td>
<td>500</td>
<td>732+60</td>
<td>737+80</td>
<td>12</td>
<td>10.0 (13.9)</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>9.2</td>
<td>--- ---</td>
<td>$120,000</td>
<td>$12,000</td>
<td>The 8'-tall shoulder mounted barrier benefits 10 of the 12 impacted residences</td>
</tr>
<tr>
<td>CD7-4I Shoulder Mounted</td>
<td>I-4 Eastbound on Retaining and MSE Walls</td>
<td>14</td>
<td>350</td>
<td>731+60</td>
<td>735+40</td>
<td>12</td>
<td>10.5 (13.9)</td>
<td>12</td>
<td>0</td>
<td>12</td>
<td>9.3</td>
<td>--- ---</td>
<td>$147,000</td>
<td>$12,200</td>
<td>The 8'-tall shoulder mounted barrier benefits all 12 impacted residences</td>
<td></td>
</tr>
<tr>
<td>I-4 PD&amp;E Noise Study Report Section 2 dated August 2002 Noise Sensitive Area 44</td>
<td>--- Ground Mounted (Constructed)</td>
<td>I-4 Eastbound Right-of-Way Line</td>
<td>17.3 (Average)</td>
<td>6,120</td>
<td>---</td>
<td>---</td>
<td>207</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>264</td>
<td>7.4</td>
<td>--- ---</td>
<td>$2,178,720</td>
<td>$8,353</td>
<td>The recommended PD&amp;E Study noise barrier was constructed by FDOT as part of a separate project</td>
</tr>
</tbody>
</table>

Conceptual noise barrier design that meets FDOT’s reasonable cost criteria and noise reduction design goal of at least a 7.0 dB(A) reduction for at least one impacted receiver site; Noise barriers recommended for further consideration and public input.
Noise Activity Categories (NAC) and Criteria

- **B**: RESIDENTIAL, 66.0 dB(A)
- **C**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **D**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **E**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)

- **F**: NON-SENSITIVE DEVELOPED, N/A; NAC F

Noise Barriers

- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

**FIGURE 3-2 PRELIMINARY NOISE BARRIER LOCATIONS MAP**
Sheet 1 of 29
Noise Activity Categories (NAC) and Criteria

- **B**: RESIDENTIAL, 66.0 dB(A)
- **C**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **D**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **E**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **F**: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers

- **Ground Mounted (Recommended)**
- **Shoulder Mounted, 14 FT (Recommended)**
- **Shoulder Mounted, 8 FT (Recommended)**
- **Noise Barrier Not Recommended**
- **Existing Noise Barriers**

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 2 of 29
Noise Activity Categories (NAC) and Criteria

- B: RESIDENTIAL, 66.0 dB(A)
- C: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- D: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- E: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)

- No NAC or NAC F: NON-SENSITIVE DEVELOPED, N/A, NAC

Noise Barriers

- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 3 of 29
Noise Activity Categories (NAC) and Criteria

- **B**: RESIDENTIAL, 66.0 dB(A)
- **C**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **D**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **E**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)

- **F**: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers

- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 4 of 29
Noise Activity Categories (NAC) and Criteria

- **B**: RESIDENTIAL, 66.0 dB(A)
- **C**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **D**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **E**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **F**: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers

- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 5 of 29
Noise Activity Categories (NAC) and Criteria
- R: RESIDENTIAL, 66.0 dB(A)
- C: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- D: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- E: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- F: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers
- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

I-4 ULTIMATE PROJECT
FROM EAST OF KIRKMAN ROAD TO EAST OF SR 434
ORANGE AND SEMINOLE COUNTIES, FLORIDA
FPID: 432193-1-52-01

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 6 of 29
Noise Activity Categories (NAC) and Criteria

- **B**: RESIDENTIAL, 66.0 dB(A)
- **C**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **D**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **E**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **F**: NON-SENSITIVE DEVELOPED, N/A

Noise Barriers

- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

**FIGURE 3-2**
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 7 of 29
Noise Activity Categories (NAC) and Criteria

- **D**: RESIDENTIAL, 51.0 dB(A)
- **E**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **F**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **G**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **H**: NON-SENSITIVE DEVELOPED, N/A; NAC
- **I**: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers:
- **A**: Ground Mounted (Recommended)
- **B**: Shoulder Mounted, 14 FT (Recommended)
- **C**: Shoulder Mounted, 8 FT (Recommended)
- **D**: Existing Noise Barriers

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet B of 29

I-4 ULTIMATE PROJECT
FROM EAST OF KIRKMAN ROAD TO EAST OF SR 434
ORANGE AND SEMINOLE COUNTIES, FLORIDA
FPID: 432193-1-52-01
EXISTING 8 FT-TALL SHOULDER MOUNTED NOISE BARRIER

Kaley Ave
W Miller St

I R Inc
Alsco Inc
Kaley Mart
FIS Outdoor
Earth America
Coby Union LLC
City Fleet Svc
Merita Bakeries
Sunoco Foodmart
Westwood Gardens
Angebilt Addition
Bluworld of Water

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 9 of 29

Noise Activity Categories (NAC) and Criteria
B: RESIDENTIAL, 66.0 dB(A)
C: OTHER SENSITIVE LAND USES, 66.0 dB(A)
D: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
E: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)

Noise Barriers
- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- No NAC or NAC F: NON-SENSITIVE DEVELOPED, N/A, NAC
- Existing Noise Barriers

I-4 ULTIMATE PROJECT
FROM EAST OF KIRKMAN ROAD TO EAST OF SR 434
ORANGE AND SEMINOLE COUNTIES, FLORIDA
FPID: 432193-1-52-01

NSA 2-C
NSA 2-F
NSA 2-D
Noise Activity Categories (NAC) and Criteria
- A: RESIDENTIAL, 66.0 dB(A)
- B: RESIDENTIAL, 66.0 dB(A)
- C: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- D: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- E: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- F: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers
- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 10 of 29
Noise Activity Categories (NAC) and Criteria

- **B**: RESIDENTIAL, 66.0 dB(A)
- **C**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **D**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **E**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **F**: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers

- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 13 of 29

1-4 ULTIMATE PROJECT
FROM EAST OF KIRKMAN ROAD TO EAST OF SR 434
ORANGE AND SEMINOLE COUNTIES, FLORIDA
FPID: 432193-1-52-01
FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 14 of 29

Noise Activity Categories (NAC) and Criteria

- **D**: RESIDENTIAL, 65.0 dB(A)
- **E**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **F**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **G**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **H**: SENSITIVE DEVELOPMENT, N/A
- **I**: NON-SENSITIVE DEVELOPED, N/A

Noise Barriers

- **Ground Mounted (Recommended)**
- **Shoulder Mounted, 14 FT (Recommended)**
- **Shoulder Mounted, 8 FT (Recommended)**
- **Noise Barrier Not Recommended**
- **Existing Noise Barriers**
Noise Activity Categories (NAC) and Criteria
- R: RESIDENTIAL, 65.0 dB(A)
- C: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- D: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- E: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- F: NON-SENSITIVE DEVELOPED, N/A, NAC

Noise Barriers
- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 15 of 29
3-70
Noise Activity Categories (NAC) and Criteria

- **A**: RESIDENTIAL, 66.0 dB(A)
- **B**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **C**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **D**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **E**: NON-SENSITIVE DEVELOPED, N/A

Noise Barriers

- **Ground Mounted (Recommended)**
- **Shoulder Mounted, 14 FT (Recommended)**
- **Shoulder Mounted, 8 FT (Recommended)**
- **Noise Barrier Rail Recommended**
- **Existing Noise Barriers**

**FIGURE 3-2**
PRELIMINARY
NOISE BARRIER
LOCATIONS MAP
Sheet 16 of 29

4 EXPRESS
I-4 ULTIMATE PROJECT
FROM EAST OF KIRKMAN ROAD TO EAST OF SR 434
ORANGE AND SEMINOLE COUNTIES, FLORIDA
FPID: 432193-1-52-01

Noise Activity Categories (NAC) and Criteria

- **R**: RESIDENTIAL, 66.0 dB(A)
- **C**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **D**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **E**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **F**: NON-SENSITIVE DEVELOPED, N/A

Noise Barriers

- **Ground Mounted (Recommended)**
- **Shoulder Mounted, 14 FT (Recommended)**
- **Shoulder Mounted, 8 FT (Recommended)**
- **Noise Barrier Rail Recommended**
- **Existing Noise Barriers**

**FIGURE 3-2**
PRELIMINARY
NOISE BARRIER
LOCATIONS MAP
Sheet 16 of 29

4 EXPRESS
I-4 ULTIMATE PROJECT
FROM EAST OF KIRKMAN ROAD TO EAST OF SR 434
ORANGE AND SEMINOLE COUNTIES, FLORIDA
FPID: 432193-1-52-01

Noise Activity Categories (NAC) and Criteria

- **R**: RESIDENTIAL, 66.0 dB(A)
- **C**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **D**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **E**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **F**: NON-SENSITIVE DEVELOPED, N/A

Noise Barriers

- **Ground Mounted (Recommended)**
- **Shoulder Mounted, 14 FT (Recommended)**
- **Shoulder Mounted, 8 FT (Recommended)**
- **Noise Barrier Rail Recommended**
- **Existing Noise Barriers**

**FIGURE 3-2**
PRELIMINARY
NOISE BARRIER
LOCATIONS MAP
Sheet 16 of 29
EXISTING 8 FT-TALL SHOULDER MOUNTED NOISE BARRIER

KENNEDY BLVD

WKCF

WESH

T-Mobile

Promo Only

Orlando Mini

Everest Univ

Great Helm Inc

Flooring Center

Life Academy

Monster Media

Lra Insurance

Parker Boat Co

NSA 4-A

NSA 4-B

FIGURE 3-2

PRELIMINARY NOISE BARRIER LOCATIONS MAP

Sheet 17 of 29

Noise Activity Categories (NAC) and Criteria

- B: RESIDENTIAL, 66.0 dB(A)
- C: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- D: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- E: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- N: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers

- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

I-4 ULTIMATE PROJECT
FROM EAST OF KIRKMAN ROAD TO EAST OF SR 434
ORANGE AND SEMINOLE COUNTIES, FLORIDA
FPID: 432193-1-52-01
Noise Activity Categories (NAC) and Criteria:
- **R**: Residential, 66.0 dB(A)
- **C**: Other Sensitive Land Uses, 66.0 dB(A)
- **D**: Institutional (Interior), 51.0 dB(A)
- **E**: Sensitive Commercial (Exterior), 71.0 dB(A)
- **N/A**: No NAC or NAC F: Non-Sensitive Developed

Noise Barriers:
- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers
EXISTING 8 FT-TALL SHOULDER MOUNTED NOISE BARRIER

ORANOLE RD
WYMORE RD

AT&T Store
Think Agency
MFC Mortgage
Strayer University
Pinkerton & Laws Co
Deisy Grimaldo Cleaning
Benton Woods Subdivision
Orangewood Christian Elem
Hidden Estates Subdivision
Altamonte Manor Apartments
Destiny Springs Condominium
Holy Trinity Greek Orthodox
Spring Lake Hills Apartments
Southern Style House Cleaning
King of Kings Lutheran Church
NSA 4-D
NSA 4-C

Noise Activity Categories (NAC) and Criteria
- B: RESIDENTIAL, 66.0 dB(A)
- C: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- D: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- E: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- F: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers
- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

FIGURE 3-2 PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 19 of 29
Noise Activity Categories (NAC) and Criteria

- **A**: RESIDENTIAL, 66.0 dB(A)
- **B**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **C**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **D**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **E**: SENSITIVE COMMERCIAL (INTERIOR), 71.0 dB(A)

Noise Barriers

- **Ground Mounted (Recommended)**
- **Shoulder Mounted, 14 FT (Recommended)**
- **Shoulder Mounted, 8 FT (Recommended)**
- **Noise Barrier Not Recommended**
- **Existing Noise Barriers**

**FIGURE 3-2**
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 20 of 29
Noise Activity Categories (NAC) and Criteria

- **A**: RESIDENTIAL, 66.0 dB(A)
- **B**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **C**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **D**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **E**: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers

- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 21 of 29
EXISTING 18 FT-TALL GROUND MOUNTED NOISE BARRIER

60' OF EXISTING 18' TALL GROUND MOUNTED BARRIER WILL BE REMOVED

Noise Activity Categories (NAC) and Criteria
- R: RESIDENTIAL, 66.0 dB(A)
- C: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- D: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- E: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- F: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers
- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- No NAC or NAC F: NON-SENSITIVE DEVELOPED, N/A; NAC
- Existing Noise Barriers

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 23 of 29
Noise Activity Categories (NAC) and Criteria

- **B**: RESIDENTIAL, 66.0 dB(A)
- **C**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **D**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **E**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **F**: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers

- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers
EXISTING 8 FT-TALL SHOULDER MOUNTED NOISE BARRIER

Noise Activity Categories (NAC) and Criteria

- B: RESIDENTIAL, 66.0 dB(A)
- C: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- D: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- E: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- F: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers
- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 27 of 29
FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 28 of 29

Noise Activity Categories (NAC) and Criteria

- **B**: RESIDENTIAL, 66.0 dB(A)
- **C**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **D**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **E**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)
- **F**: NON-SENSITIVE DEVELOPED, N/A; NAC

Noise Barriers

- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers
Noise Activity Categories (NAC) and Criteria

- **B**: RESIDENTIAL, 66.0 dB(A)
- **C**: OTHER SENSITIVE LAND USES, 66.0 dB(A)
- **D**: INSTITUTIONAL (INTERIOR), 51.0 dB(A)
- **E**: SENSITIVE COMMERCIAL (EXTERIOR), 71.0 dB(A)

Noise Barriers

- Ground Mounted (Recommended)
- Shoulder Mounted, 14 FT (Recommended)
- Shoulder Mounted, 8 FT (Recommended)
- Noise Barrier Not Recommended
- Existing Noise Barriers

FIGURE 3-2
PRELIMINARY NOISE BARRIER LOCATIONS MAP
Sheet 29 of 29
3.3 Noise Barrier Analysis Summary

The results of the noise barrier analysis and recommendations for each of the noise sensitive areas reassessed for the I-4 Ultimate Project are summarized in Table 3.19. The 11 noise barriers considered feasible and reasonable and committed to further consideration in the FEIS and the two RODs remain feasible and reasonable or have already been constructed (i.e., NSAs 2-E, 2-F, 2-H, 2-I, 2-J, 3-B, 3-C, 3-D, 3-E, 3-F, and 4-C) and are recommended for further consideration and public input. The locations where noise barriers were considered reasonable and feasible during the PD&E Study are highlighted in green in Table 3.19. Furthermore, six additional noise barriers for NSA 2-AA, 2-BB, 2-B, 3-G, 3-H and 4-G are also considered feasible and cost reasonable and are recommended for public input. However, during preliminary coordination with the property owner in NSA 2-AA, they did not support the construction of a noise barrier. Therefore, construction of a noise barrier at this location (i.e., NSA 2-AA) is not considered reasonable due to lack of support and is not recommended for further consideration for design and construction. Among the reassessed areas, noise barriers were not considered cost reasonable at NSA 4-D and were not recommended for further consideration. The project will impact two existing noise barriers previously constructed for NSA 2-H and 4-I and will require replacement noise barriers to be constructed.
<table>
<thead>
<tr>
<th>Average Noise Reduction</th>
<th>Number of Benefited Receptors</th>
<th>Number of Impacted Receptor Sites</th>
<th>Total Number of Benefited Receptor Sites</th>
<th>Average Cost/Site for all Benefited Noise Barriers</th>
<th>Cost ($/dB) per square foot</th>
<th>Average Cost/Site Benefited</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 2A South of John Young Parkway</td>
<td>No</td>
<td>2,070</td>
<td>117 30,00</td>
<td>3 6.3 (8.1)</td>
<td>60</td>
<td>0</td>
<td>64</td>
</tr>
<tr>
<td>2 2B South of John Young Parkway</td>
<td>No</td>
<td>2,700</td>
<td>117 30,00</td>
<td>32 24</td>
<td>66</td>
<td>7.2</td>
<td>$1,158,208</td>
</tr>
<tr>
<td>2 6 North of E. Orange Avenue</td>
<td>No</td>
<td>1,400</td>
<td>118 30,00</td>
<td>69</td>
<td>37</td>
<td>6.8</td>
<td>$972,816.00</td>
</tr>
<tr>
<td>2 2 North of SR 408</td>
<td>Yes</td>
<td>1,000</td>
<td>117 30,00</td>
<td>61</td>
<td>38</td>
<td>7.8</td>
<td>$791,850.00</td>
</tr>
<tr>
<td>2 3 South of Princeton Street</td>
<td>Yes</td>
<td>100</td>
<td>116 30,00</td>
<td>14</td>
<td>100</td>
<td>274 4.5</td>
<td>$1,512,000</td>
</tr>
<tr>
<td>2 3 North of SR 408</td>
<td>Yes</td>
<td>2,100</td>
<td>550 75</td>
<td>6 12</td>
<td>12.8</td>
<td>$819,600</td>
<td>---</td>
</tr>
<tr>
<td>3 3C Between Princeton Street and SR 408</td>
<td>Yes</td>
<td>200</td>
<td>116 30,00</td>
<td>274 4.5</td>
<td>8</td>
<td>279 4.5</td>
<td>$1,741,800.00</td>
</tr>
</tbody>
</table>

Notes: Green highlighted cells represent noise sensitive areas where noise barrier were considered feasible and reasonable during the PD&E Study. * Stationing based on centerline of survey stationing system. Stationing includes taper length for shoulder mounted noise barriers.
<table>
<thead>
<tr>
<th>Station</th>
<th>Noise Barrier Type</th>
<th>Reasonable and Feasible During PD&amp;E Study?</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-D</td>
<td>Shoulder Mounted on MSE Wall and Bridge Structures - Segment 1</td>
<td>Yes NB-8</td>
<td>--</td>
</tr>
<tr>
<td>3-F</td>
<td>Shoulder Mounted on MSE Wall and Bridge Structures - Segment 1</td>
<td>Yes NB-9</td>
<td>--</td>
</tr>
<tr>
<td>3-I</td>
<td>Shoulder Mounted on MSE Wall and Bridge Structures - Segment 2</td>
<td>Yes NB-10</td>
<td>--</td>
</tr>
<tr>
<td>4-I</td>
<td>Shoulder Mounted on MSE Wall and Bridge Structures - Segment 2</td>
<td>Yes NB-11</td>
<td>--</td>
</tr>
<tr>
<td>4-J</td>
<td>Shoulder Mounted on MSE Wall and Bridge Structures - Segment 2</td>
<td>Yes NB-12</td>
<td>--</td>
</tr>
<tr>
<td>4-K</td>
<td>Shoulder Mounted on MSE Wall and Bridge Structures - Segment 2</td>
<td>Yes NB-13</td>
<td>--</td>
</tr>
<tr>
<td>5-D</td>
<td>Shoulder Mounted on MSE Wall and Bridge Structures - Segment 3</td>
<td>Yes NB-14</td>
<td>--</td>
</tr>
<tr>
<td>6-D</td>
<td>Shoulder Mounted on MSE Wall and Bridge Structures - Segment 3</td>
<td>Yes NB-15</td>
<td>--</td>
</tr>
</tbody>
</table>

Notes: Green highlighted cells represent noise sensitive areas where noise barrier were considered feasible and reasonable during the PD&E Study.

* Stationing based on centerline of survey stationing system. Stationing includes taper length for shoulder mounted noise barriers.
3.4 Noise Barrier Recommendations

Noise barriers are recommended for further consideration and public input at 15 NSAs (i.e., Noise Barriers NB-1 through NB-15) including two barriers that would replace existing noise barriers. The type, location, and dimensions of the recommended noise barriers are summarized in Table 3.20 and are shown in Figure 3-2. Figure 3-3 shows the general location of the recommended noise barriers. FDOT continues to be committed to the construction of feasible noise abatement measures at 8 of the 11 locations that were recommended for further consideration in the 2002 and 2005 RODs and have not yet been constructed and at the five additional areas where noise barriers are considered reasonable and feasible as part of this study. Also, if directly impacted, the existing barriers for NSA 2-H and 4-I will be replaced as part of this project. If necessary, during the final design process, FDOT will reevaluate the recommended noise barriers based on any proposed major design changes or substantial changes in land uses. In addition, prior to design and construction, FDOT will solicit community input regarding desires, types, heights, and locations of the noise barriers recommended.
<table>
<thead>
<tr>
<th>Area Number</th>
<th>General Location (Grace Sheets)</th>
<th>Relative Location (Road/Town/Lane Directions)</th>
<th>Type of Noise Source (All Noise Sources Fall into Category)</th>
<th>Notes Barriers Considered Reasonable and Feasible during the PD&amp;E Study</th>
<th>Geomat Reference Barrier Design Number</th>
<th>Barrier Type</th>
<th>Height (ft)</th>
<th>Length (ft)</th>
<th>Begin Station</th>
<th>End Station</th>
<th>Left/Right</th>
<th>Well Known Barrier Recommended for Design and Construction?</th>
<th>Side Known Barrier Recommended for Design and Construction?</th>
<th>Recommended Barrier for Number</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-8</td>
<td>East of John Young Parkway</td>
<td>North of I-4 (Westbound)</td>
<td>Residential (Activity Category: B)</td>
<td>No</td>
<td>CD1-30</td>
<td>Shoulder Mounted on MSE and Retaining Wall</td>
<td>14</td>
<td>1,700</td>
<td>114±70</td>
<td>117±10</td>
<td>Left</td>
<td>Yes</td>
<td>Yes</td>
<td>NB-1</td>
<td></td>
</tr>
<tr>
<td>3-8</td>
<td>East of Princeton Street</td>
<td>West of 4 (Westbound)</td>
<td>Residential (Activity Category: B)</td>
<td>Yes</td>
<td>CD2-10</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>14</td>
<td>1,450</td>
<td>161±40</td>
<td>165±40</td>
<td>Left</td>
<td>Yes</td>
<td>No</td>
<td>NB-2</td>
<td></td>
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<tr>
<td>3-4</td>
<td>South of SR 408</td>
<td>West of 4 (Westbound)</td>
<td>Residential (Activity Category: B)</td>
<td>Yes</td>
<td>CD3-20</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>14</td>
<td>100</td>
<td>122±75</td>
<td>125±75</td>
<td>Left</td>
<td>Yes</td>
<td>No</td>
<td>NB-3</td>
<td></td>
</tr>
<tr>
<td>3-8</td>
<td>Between University and Park Ave</td>
<td>West of 4 (Westbound)</td>
<td>Residential (Activity Category: B)</td>
<td>Yes</td>
<td>CD3-27</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>13</td>
<td>3,000</td>
<td>10±40</td>
<td>11±40</td>
<td>Left</td>
<td>No</td>
<td>Yes</td>
<td>NB-4</td>
<td></td>
</tr>
<tr>
<td>3-6</td>
<td>North of I-4 (West of 4)</td>
<td>North of I-4 (West of 4)</td>
<td>Residential (Activity Category: B)</td>
<td>Yes</td>
<td>CD4-36</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>14</td>
<td>200</td>
<td>28±100</td>
<td>29±100</td>
<td>Left</td>
<td>Yes</td>
<td>No</td>
<td>NB-5</td>
<td></td>
</tr>
<tr>
<td>3-3</td>
<td>Between Princeton Street and Par</td>
<td>West of 4 (Westbound)</td>
<td>Residential (Activity Category: B)</td>
<td>Yes</td>
<td>CD5-30</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>14</td>
<td>1,500</td>
<td>22±100</td>
<td>23±100</td>
<td>Right</td>
<td>Yes</td>
<td>Yes</td>
<td>NB-6</td>
<td></td>
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<tr>
<td>3-7</td>
<td>South of Princeton Street</td>
<td>East of 4 (Diagonal)</td>
<td>Residential (Activity Category: B)</td>
<td>Yes</td>
<td>CD5-35</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>14</td>
<td>1,000</td>
<td>28±100</td>
<td>29±100</td>
<td>Left</td>
<td>Yes</td>
<td>Yes</td>
<td>NB-7</td>
<td></td>
</tr>
<tr>
<td>3-8</td>
<td>Between Par and Princeton Ave</td>
<td>West of 4 (Westbound)</td>
<td>Residential (Activity Category: B)</td>
<td>Yes</td>
<td>CD5-36</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>14</td>
<td>200</td>
<td>37±100</td>
<td>38±100</td>
<td>Left</td>
<td>Yes</td>
<td>Yes</td>
<td>NB-8</td>
<td></td>
</tr>
<tr>
<td>3-9</td>
<td>South of Princeton Ave</td>
<td>East of 4 (Diagonal)</td>
<td>Residential (Activity Category: B)</td>
<td>Yes</td>
<td>CD5-37</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>14</td>
<td>1,900</td>
<td>55±100</td>
<td>56±100</td>
<td>Left</td>
<td>No</td>
<td>Yes</td>
<td>NB-9</td>
<td></td>
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<tr>
<td>3-11</td>
<td>North of I-4 (West of 4)</td>
<td>North of I-4 (West of 4)</td>
<td>Residential (Activity Category: B)</td>
<td>No</td>
<td>CD1-20</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>13</td>
<td>1,580</td>
<td>3±150</td>
<td>5±150</td>
<td>Left</td>
<td>Yes</td>
<td>Yes</td>
<td>NB-10</td>
<td></td>
</tr>
<tr>
<td>3-12</td>
<td>North of I-4 (West of 4)</td>
<td>East of 4 (Diagonal)</td>
<td>Residential (Activity Category: B)</td>
<td>No</td>
<td>CD2-30</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>13</td>
<td>1,450</td>
<td>3±150</td>
<td>5±150</td>
<td>Left</td>
<td>Yes</td>
<td>Yes</td>
<td>NB-11</td>
<td></td>
</tr>
<tr>
<td>3-13</td>
<td>Between Princeton Street and Par</td>
<td>West of 4 (Westbound)</td>
<td>Residential (Activity Category: B)</td>
<td>Yes</td>
<td>CD2-40</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>14</td>
<td>6,100</td>
<td>6±100</td>
<td>8±100</td>
<td>Left</td>
<td>Yes</td>
<td>Yes</td>
<td>NB-12</td>
<td></td>
</tr>
<tr>
<td>3-14</td>
<td>Between Princeton Street and Par</td>
<td>East of 4 (Diagonal)</td>
<td>Residential (Activity Category: B)</td>
<td>No</td>
<td>CD3-30</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>13</td>
<td>1,300</td>
<td>10±100</td>
<td>12±100</td>
<td>Right</td>
<td>Yes</td>
<td>Yes</td>
<td>NB-13</td>
<td></td>
</tr>
<tr>
<td>3-15</td>
<td>East of 4 (Diagonal)</td>
<td>East of 4 (Diagonal)</td>
<td>Residential (Activity Category: B)</td>
<td>Yes</td>
<td>CD3-40</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>14</td>
<td>5,900</td>
<td>6±100</td>
<td>8±100</td>
<td>Left</td>
<td>Yes</td>
<td>Yes</td>
<td>NB-14</td>
<td></td>
</tr>
<tr>
<td>4-11</td>
<td>North of I-4 (West of 4)</td>
<td>East of 4 (Diagonal)</td>
<td>Residential (Activity Category: B)</td>
<td>Yes</td>
<td>CD4-31</td>
<td>Shoulder Mounted on MSE and Bridge Structure</td>
<td>14</td>
<td>450</td>
<td>7±100</td>
<td>9±100</td>
<td>Right</td>
<td>Yes</td>
<td>Yes</td>
<td>NB-15</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Green highlighted cells represent noise sensitive areas where noise barrier were considered feasible and reasonable during the PD&E Study.
4.0 Bibliography


Florida Department of Transportation "Standard Specifications for Road and Bridge Construction", 2013; 1,160 pages.
Appendix A

2002 I-4 PD&E Noise Impact Report Referenced Pages
Figure 1.0.1
Project Study Limits
I-4 PD&E Study - Section 2
SECTION TWO

2.0 Noise Study

2.1 Study Objectives

The objectives of this noise study include the following: (1) detailing the existing noise environment within the project area; (2) presenting the results of the noise analysis and determining the significance of anticipated project impacts on noise sensitive sites; (3) evaluating reasonable and feasible noise abatement measures where warranted; and (4) identifying noise impacts related to construction activities and measures to minimize construction noise impacts. Additionally, the report provides the distance to a noise contour which can be used by local government and planning agencies as a guide to minimize the development of noise sensitive land use in proximity to the Interstate.

2.2 Project Setting and Noise Propagation Environment

Noise levels are influenced by characteristics of the source-to-receiver path, including the effects of intervening barriers and structures, ground surface type (hard or soft) and topography. Existing noise sensitive sites are primarily located on land that is at grade with respect to the nearest travel lanes; therefore, noise levels are not greatly affected by topography.

There are no intervening barriers or adequate vegetation between the roadways and first-row receivers that would greatly affect noise levels. However, second-row structures and third-row structures were given a shielding factor to account for the reduction in noise provided by first-row structures, where appropriate. In certain situations, where first-row structures are partially shielded, a 1 dBA reduction is assigned for those structures. Following FHWA guidance, second-row structures were generally assigned a conservatively low shielding factor of 3 dBA to account for the reduction caused by first-row structures. For each row beyond the second, an additional shielding of 1 dBA per row was applied up to a total maximum of 5 dBA.

2.3 Noise Sensitive Areas

A review of the project corridor identified 51 noise sensitive areas that have the potential to be impacted by the proposed project. Each of these areas are illustrated on the Noise Study Plans submitted with this report and are shown in Figure 2.3.1. Following is a description of each Noise Sensitive Area:

**Noise Sensitive Area 1-A** is located east of I-4 and south of SR 528 (Bee Line Expressway). This Noise Sensitive Area represents approximately 102 noise sensitive sites at the McKinley Lake Apartments.

**Noise Sensitive Area 1-B** is located west of the I-4 and SR 528 (Bee Line Expressway) Interchange. This Noise Sensitive Area represents approximately 371 noise sensitive sites at the West Gate Lakes Resort.

**Noise Sensitive Area 1-C** is located west of International Drive and north of SR 528 (Bee Line Expressway). This Noise Sensitive Area is designated as a commercial area.

**Noise Sensitive Area 1-D** is located west of International Drive and south of SR 528 (Bee Line Expressway). This Noise Sensitive Area is designated as a commercial area.
Noise Sensitive Area 1-E is located west of I-4 and Turkey Lake Road. This Noise Sensitive Area represents 134 noise sensitive sites between the Comfort Suites Hotel and the Vinings at Sand Lake.

Noise Sensitive Area 1-F is located east of I-4 and west of International Drive. This Noise Sensitive Area is primarily occupied by hotels with limited recreation areas.

Noise Sensitive Area 1-G is located east of I-4, northwest of International Drive and north of Sand Lake Road (SR 482). This Noise Sensitive Area is primarily occupied by hotels with limited recreation areas.

Noise Sensitive Area 1-H is located northwest of I-4 and east of Kirkman Road (SR 435). This Noise Sensitive Area represents approximately 552 noise sensitive sites between the Days Inn and the Delta Orlando Resort.

Noise Sensitive Area 1-I is located northwest of I-4, west of Orlando Vineland Road and east of Florida’s Turnpike. This Noise Sensitive Area represents approximately 140 noise sensitive sites between Tamarind Condominiums and the Villas of Cypress Creek.

Noise Sensitive Area 1-J is located northwest of I-4, west of Orlando Vineland Road and west of Conroy Road. This Noise Sensitive Area represents approximately 286 noise sensitive sites between Cypress Creek Apartments, Park Street Apartments and Oakwood Apartments.

Noise Sensitive Area 2-A is located south of I-4 and west of Orange Blossom Trail (US 441). This Noise Sensitive Area represents approximately 127 noise sensitive sites consisting of single family homes.

Noise Sensitive Area 2-B is located north of I-4 and west of Orange Blossom Trail (US 441). This Noise Sensitive Area represents approximately 97 noise sensitive sites associated with single family homes and Rio Grande Apartments.

Noise Sensitive Area 2-C is located west of I-4 between Orange Blossom Trail (US 441) and Kaley Street. This Noise Sensitive Area represents single family homes and the Holden Heights Baptist Church with approximately 91 noise sensitive sites.

Noise Sensitive Area 2-D is located east of I-4 between Orange Blossom Trail (US 441) and Michigan Street. This Noise Sensitive Area represents single family homes, Pineloch Elementary School, House of Hope Church, Living Hope International Ministries and part of the Veranda Nursing Home. The noise sensitive area represents approximately 66 noise sensitive sites.

Noise Sensitive Area 2-E is located in the center of the SR 408 (East/West Expressway)/I-4 Interchange. This Noise Sensitive Area represents Griffin Park and Shady Lyn Apartments with approximately 173 noise sensitive sites.

Noise Sensitive Area 2-F is located west of I-4, south of SR 408 (East/West Expressway), and north of Kaley Street. This Noise Sensitive Area represents single family homes with approximately 122 noise sensitive sites.

Noise Sensitive Area 2-G is located west of I-4 and south of the SR 408 (East/West Expressway). This Noise Sensitive Area represents single family homes and apartments, South Holden Parramore Neighborhood including part of the Sun Charm Court Retirement Living, Rio Grande High School and the Vacation Lodge Hotel combined for a total of approximately 289 noise sensitive sites.
**SECTION TWO**

**Noise Study**

**Noise Sensitive Area 2-H** is located west of I-4 and north of SR 408 (East/West Expressway). This Noise Sensitive Area represents single family homes, Harvest Baptist Church, Bethel Missionary Baptist Church and the Maxey House, combined for a total of approximately 157 noise sensitive sites.

**Noise Sensitive Area 2-I** is located east of I-4 and south of SR 408 (East/West Expressway). This Noise Sensitive Area represents approximately 181 noise sensitive sites comprised primarily of single family homes in the Lake Cherokee Historic District.

**Noise Sensitive Area 2-J** is located east of I-4 and north of SR 408 (East/West Expressway). This Noise Sensitive Area represents single family homes and apartments for a total of approximately 234 noise sensitive sites.

**Noise Sensitive Area 2-K** is located west of I-4, north of SR 408 (East/West Expressway), and south of Livingston Street. This Noise Sensitive Area represents single family homes of the North Holden Parramore neighborhood, public buildings (i.e., courthouse, police headquarters) and hotels, combined for a total of approximately 89 noise sensitive sites.

**Noise Sensitive Area 3-A** is located west of I-4, across Lake Concord from Colonial Drive (SR 50) to Lake Ivanhoe. This Noise Sensitive Area represents single family homes, Holiday Inn, Central Christ Church, Concord Lake Apartments, Hampshire Apartments, Fountain Tree Apartments, Don Dudley Park and Lake Ivanhoe Park combined for a total of approximately 319 noise sensitive sites.

**Noise Sensitive Area 3-B** is located west of I-4 from Lake Ivanhoe North to SR 438 (Princeton Street). This Noise Sensitive Area represents approximately 122 noise sensitive sites comprised of single family homes.

**Noise Sensitive Area 3-C** is located west of I-4 from SR 438 (Princeton Street) to Par Street. This Noise Sensitive Area represents single family homes, Matthews Park, Orlando Junior Academy and John Knox Presbyterian Church combined for a total of approximately 156 noise sensitive sites.

**Noise Sensitive Area 3-D** is located east of I-4 and west of Orange Avenue (SR 527) between Lake Ivanhoe south and Groveland Street. This Noise Sensitive Area represents single family homes, Lake Ivanhoe Shores Apartments, Colonial Apartments, Seventh Day Adventist Church and medical and business offices combined for a total of approximately 225 noise sensitive sites.

**Noise Sensitive Area 3-E** is located west of I-4 between Par Street and SR 426 (Fairbanks Avenue). This Noise Sensitive Area represents single family homes, the Church of Jesus Christ of Latter Day Saints and Templo Evangelistico Del Nazareno Church, for a total of approximately 149 noise sensitive sites.

**Noise Sensitive Area 3-F** is located east of I-4 between Groveland Street and SR 426 (Fairbanks Avenue). This Noise Sensitive Area represents single family homes, The Oaks Apartments, medical offices, Calvary Assembly of God Church, Reorganized Church of Jesus Christ of Latter Day Saints, The Seventh Day Adventist Church, Killarney Baptist Church and commercial and business offices combined for a total of approximately 138 noise sensitive sites.
**Noise Sensitive Area 3-G** is located west of I-4 between SR 426 (Fairbanks Avenue) and SR 423 (Lee Road). This Noise Sensitive Area represents single family homes, Knights Inn, Holiday Inn, Temple Israel and commercial and business office buildings combined for a total of approximately 277 noise sensitive sites.

**Noise Sensitive Area 3-H** is located east of I-4 between SR 426 (Fairbanks Avenue) and SR 423 (Lee Road). This Noise Sensitive Area represents single family homes, Killarney Elementary School, Florida Conference of Seventh Day Adventist Church, and business offices combined for a total of approximately 132 noise sensitive sites.

**Noise Sensitive Area 4-A** is located west of I-4 and north of SR 423 (Lee Road). This Noise Sensitive Area represents single family homes, Florida Catholic Church, Orlando College North Campus, and commercial buildings combined for a total of approximately 19 noise sensitive sites.

**Noise Sensitive Area 4-B** is located east of I-4 and north of Wymore Road. This Noise Sensitive Area represents single family homes, Hungerford Elementary School, Life Center Church and business offices combined for a total of approximately 68 noise sensitive sites.

**Noise Sensitive Area 4-C** is located west of I-4, north of Lake Destiny Drive and south of SR 436. This Noise Sensitive Area represents single family homes, Destiny Springs Condominiums, Altamonte Manor Apartments, Spring Lake Hills Apartments, The Ashfords Apartments, La Plaza Apartments, Spanish Trace Apartments, Days Inn, Holiday Inn, Spring Colony Apartments, Wymore Grove Apartments and commercial buildings combined for a total of approximately 907 noise sensitive sites.

**Noise Sensitive Area 4-D** is located east of I-4, north of Maitland Boulevard, and south of Crane's Roost Lake. This Noise Sensitive Area represents single family homes, King of Kings Lutheran Church and School, Maitland Christian School, Grace Bretheran Church of Maitland, Holy Trinity Greek Orthodox Church, Orangewood Christian High School, Orangewood Christian Elementary School, business and commercial offices, Hidden Ridge Condominiums, Newbury Place Apartments, Hilton and The Courts at Lakeside combined for a total of approximately 165 noise sensitive sites.

**Noise Sensitive Area 4-E** is located west of I-4 between SR 436 and Central Parkway. This Noise Sensitive Area represents the Hampton Inn and Best Western combined for a total of approximately 140 noise sensitive sites.

**Noise Sensitive Area 4-F** is located west of I-4 between Central Parkway and SR 434. This Noise Sensitive Area represents single family homes, medical facilities, business and commercial offices, Kingston Village Apartments and Cameron Village combined for a total of approximately 134 noise sensitive sites.

**Noise Sensitive Area 4-G** is located east of I-4 between Central Parkway and SR 434. This Noise Sensitive Area represents single family homes with a total of 97 noise sensitive sites.

**Noise Sensitive Area 4-H** is located west of I-4 between SR 434 and E.E. Williamson Road. This Noise Sensitive Area represents single family homes, Ramada Inn, Neighborhood Alliance Church and Markham Woods Seventh Day Adventist Church combined for a total of approximately 121 noise sensitive sites.

**Noise Sensitive Area 4-I** is located east of I-4 and north of SR 434. This Noise Sensitive Area represents single family homes and Springwood Village Condominiums combined for a total of approximately 274 noise sensitive sites.

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**I-4 PD&E Study - Section 2, Noise Impact Report**
**SECTION TWO**

**Noise Sensitive Area 4-J** is located east of I-4 and south of E.E. Williamson Road. This Noise Sensitive Area represents single family homes for a total of approximately 49 noise sensitive sites.

**Noise Sensitive Area 4-K** is located west of I-4 and north of E.E. Williamson Road. This Noise Sensitive Area represents single family homes and Wekiva Assembly of God Church for a total of approximately 50 noise sensitive sites.

**Noise Sensitive Area 4-L** is located east of I-4, north of E.E. Williamson Road, and surrounds Grace Lake. This Noise Sensitive Area represents a residential neighborhood of single family homes for a total of approximately 66 noise sensitive sites.

**Noise Sensitive Area 4-M** is located west of I-4 and south of Long Pond Road. This Noise Sensitive Area represents single family homes with a total of approximately 86 noise sensitive sites.

**Noise Sensitive Area 5-A** is located west of I-4, north of Lake Mary Boulevard and east of International Parkway. This Noise Sensitive Area represents the Courtyard by Marriott with a total of approximately 25 noise sensitive sites.

**Noise Sensitive Area 5-B** is located west of I-4, south of Orange Boulevard and southwest of Lake Monroe. This Noise Sensitive Area represents single family homes with a total of 39 noise sensitive sites.

**Noise Sensitive Area 5-C** is located east of I-4, south of Orange Boulevard and southwest of Lake Monroe. This Noise Sensitive Area represents single family homes with a total of approximately 13 noise sensitive sites.

**Noise Sensitive Area 6-A** is located west of I-4, and north from Lake Monroe to Enterprise Road. This Noise Sensitive Area represents single family homes, River Oaks Estates and Bill Keller Park combined for a total of approximately 67 noise sensitive sites.

**Noise Sensitive Area 6-B** is located east of I-4 and south of Enterprise Road. This Noise Sensitive Area represents single family homes, Best Western, business and commercial offices, Deltona Villas and Shady Lake Condominiums for a total of approximately 107 noise sensitive sites.

**Noise Sensitive Area 6-C** is located east of I-4 between Enterprise Road and Saxon Boulevard. This Noise Sensitive Area represents single family homes for a total of approximately 183 noise sensitive sites.

**Noise Sensitive Area 6-D** is located west of I-4 between Enterprise Road and Saxon Boulevard. This Noise Sensitive Area represents a residential neighborhood of single family homes with a total of 84 noise sensitive sites.

**Noise Sensitive Area 6-E** is located east of I-4 between Saxon Boulevard and Rhode Island Avenue. This Noise Sensitive Area represents single family homes with a total of approximately 131 noise sensitive sites.

**Noise Sensitive Area 6-F** is located west of I-4 and south of Graves Avenue. This Noise Sensitive Area represents single family homes and Village Park Mobile Home Park for a total of approximately 191 noise sensitive sites.
Figure 2.3.1

Noise Sensitive Areas

I-4 PD&E Study - Section 2
Segment 1 of 6
Figure 2.3.1
Noise Sensitive Areas

1 Noise Monitoring Site
2 Noise Sensitive Area

I-4 PD&E Study - Section 2
Segment 2 of 6
Figure 2.3.1
Noise Sensitive Areas

I-4 PD&E Study - Section 2
Segment 3 of 6
Figure 2.3.1
Noise Sensitive Areas

I-4 PD&E Study - Section 2
Segment 4 of 6
Table 3.4.1 - Noise Barrier Analysis

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Table 34.1 - Noise Barrier Analysis, Continued
## Table 3.4.1 - Noise Barrier Analysis, Continued

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</table>

Table 3.4.1 - Noise Barrier Analysis, Continued
SECTION THREE

Noise Sensitive Area 1-B
A noise barrier is not considered to be reasonable and feasible due to the proximity of Turkey Lake Road, which does not allow a barrier to meet the minimum insertion loss requirements.

Noise Sensitive Area 1-C
A noise barrier is not considered to be reasonable and feasible because NSA 1-C is designated as a commercial area and, therefore, is not impacted.

Noise Sensitive Area 1-D
A noise barrier is not considered to be reasonable and feasible because NSA 1-D is designated as a commercial area and, therefore, is not impacted.

Noise Sensitive Area 1-E
A noise barrier is not considered to be reasonable and feasible due to the proximity of Turkey Lake Road, which does not allow a barrier to meet the minimum insertion loss requirements.

Noise Sensitive Area 1-F
A noise barrier is not considered to be reasonable and feasible due to the proximity of International Drive, which does not allow a barrier to meet the minimum insertion loss requirements.

Noise Sensitive Area 1-G
A noise barrier is not considered to be reasonable and feasible due to the proximity of International Drive, which does not allow a barrier to meet the minimum insertion loss requirements.

Noise Sensitive Area 1-H
A noise barrier is not considered to be reasonable and feasible due to the proximity of Major Boulevard and several access roads, which does not allow a barrier to meet the minimum insertion loss requirements.

Noise Sensitive Area 1-I
A noise barrier is not considered to be reasonable and feasible due to the proximity of Orlando-Vineland Road, which does not allow a barrier to meet the minimum insertion loss requirements.

Noise Sensitive Area 1-J
A noise barrier is not considered to be reasonable and feasible due to the proximity of Orlando-Vineland Road, which does not allow a barrier to meet the minimum insertion loss requirements.

Noise Sensitive Area 2-A
A noise barrier is not considered to be reasonable and feasible due to the proximity of 33rd Street, which does not allow a barrier to meet the minimum insertion loss requirements.
SECTION THREE

Noise Abatement

Noise Sensitive Area 2-B
A noise barrier 3,295 feet long, with an average height of 17.4 feet will provide a minimum 5 dBA insertion loss to 7 residences. The total cost and cost-per-residence benefited is $1,146,660 and $163,809, respectively. This barrier is not considered to be reasonable and feasible.

Noise Sensitive Area 2-C
A noise barrier 4,900 feet long, with an average height of 17.2 feet will provide a minimum 5 dBA insertion loss to 25 residences. The total cost and cost-per-residence benefited is $1,685,600 and $67,424, respectively. This barrier is not considered to be reasonable and feasible.

Noise Sensitive Area 2-D
A noise barrier 1,600 feet long, with an average height of 15.7 feet will provide a minimum 5 dBA insertion loss to 13 residences. The total cost and cost-per-residence benefited is $502,400 and $38,646, respectively. This barrier is not considered to be reasonable and feasible.

Noise Sensitive Area 2-E
A noise barrier 2,950 feet long, with an average height of 14.0 feet will provide a minimum 5 dBA insertion loss to 152 residences. The total cost and cost-per-residence benefited is $826,000 and $5,434, respectively. This barrier is considered to be reasonable and feasible for this alternative.

Noise Sensitive Area 2-F
A noise barrier 3,430 feet long, with an average height of 16.1 feet will provide a minimum 5 dBA insertion loss to 47 residences. The total cost and cost-per-residence benefited is $1,104,460 and $23,499, respectively. This barrier is considered to be reasonable and feasible for this alternative.

Noise Sensitive Area 2-G
A noise barrier 4,300 feet long, with an average height of 14.8 feet will provide a minimum 5 dBA insertion loss to 40 residences. The total cost and cost-per-residence benefited is $1,272,800 and $31,820, respectively. This barrier is not considered to be reasonable and feasible for this alternative.

Noise Sensitive Area 2-H
A noise barrier 3,320 feet long, with an average height of 13.5 feet will provide a minimum 5 dBA insertion loss to 38 residences. The total cost and cost-per-residence benefited is $896,400 and $23,589, respectively. This barrier is considered to be reasonable and feasible for this alternative.

Noise Sensitive Area 2-I
A noise barrier 3,295 feet long, with an average height of 16.2 feet will provide a minimum 5 dBA insertion loss to 37 residences. The total cost and cost-per-residence benefited is $1,068,898 and $28,889, respectively. This barrier is considered to be reasonable and feasible.

Noise Sensitive Area 2-J
A noise barrier 5,200 feet long, with an average height of 14.5 feet will provide a minimum 5 dBA insertion loss to 122 residences. The total cost and cost-per-residence benefited is $1,508,000 and $12,361, respectively. This barrier is considered to be reasonable and feasible.

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SECTION THREE

Noise Abatement

**Noise Sensitive Area 2-K**
A noise barrier is not considered to be reasonable and feasible due to the proximity of Hughey Avenue and Anderson Street, which does not allow a barrier to meet the minimum insertion loss requirements.

**Noise Sensitive Area 3-A**
A noise barrier is not considered to be reasonable and feasible due to the proximity of Ivanhoe Boulevard, which does not allow a barrier to meet the minimum insertion loss requirements.

**Noise Sensitive Area 3-B**
A noise barrier 4230 feet long, with an average height of 14.2 feet will provide a minimum 5 dBA insertion loss to 52 residences. The total cost and cost-per-residence benefited is $1,201,320 and $23,102, respectively. This barrier is considered to be reasonable and feasible for this alternative.

**Noise Sensitive Area 3-C**
A noise barrier 4560 feet long, with an average height of 16.2 feet will provide a minimum 5 dBA insertion loss to 93 residences. The total cost and cost-per-residence benefited is $1,477,440 and $15,886, respectively. This barrier is considered to be reasonable and feasible for this alternative.

**Noise Sensitive Area 3-D**
A noise barrier 6870 feet long, with an average height of 15.6 feet will provide a minimum 5 dBA insertion loss to 149 residences. The total cost and cost-per-residence benefited is $2,143,440 and $14,386, respectively. This barrier is considered to be reasonable and feasible for this alternative.

**Noise Sensitive Area 3-E**
A noise barrier 5250 feet long, with an average height of 16.5 feet will provide a minimum 5 dBA insertion loss to 77 residences. The total cost and cost-per-residence benefited is $1,732,500 and $22,500, respectively. This barrier is considered to be reasonable and feasible for this alternative.

**Noise Sensitive Area 3-F**
A noise barrier 6050 feet long, with an average height of 16 feet will provide a minimum 5 dBA insertion loss to 85 residences. The total cost and cost-per-residence benefited is $1,936,000 and $22,776, respectively. This barrier is considered to be reasonable and feasible.

**Noise Sensitive Area 3-G**
A noise barrier 3020 feet long, with an average height of 22 feet will provide a minimum 5 dBA insertion loss to 30 residences. The total cost and cost-per-residence benefited is $1,328,800 and $44,293, respectively. This barrier is not considered to be reasonable and feasible.

**Noise Sensitive Area 3-H**
A noise barrier 3630 feet long, with an average height of 15.9 feet will provide a minimum 5 dBA insertion loss to 25 residences. The total cost and cost-per-residence benefited is $1,154,340 and $46,174, respectively. This barrier is not considered to be reasonable and feasible.
SECTION THREE

Noise Abatement

Noise Sensitive Area 4-A
A noise barrier 1405 feet long, with an average height of 15.7 feet will provide a minimum 5 dBA insertion loss to 5 residences. The total cost and cost-per-residence benefited is $441,170 and $88,234, respectively. This barrier is not considered to be reasonable and feasible.

Noise Sensitive Area 4-B
A noise barrier is not considered to be reasonable and feasible due to the proximity of Wymore Road, which does not allow a barrier to meet the minimum insertion loss requirements.

Noise Sensitive Area 4-C
A noise barrier 5450 feet long, with an average height of 17.8 feet will provide a minimum 5 dBA insertion loss to 193 residences. The total cost and cost-per-residence benefited is $1,940,200 and $10,053, respectively. This barrier is considered to be reasonable and feasible.

Noise Sensitive Area 4-D
A noise barrier 2850 feet long, with an average height of 18.6 feet will provide a minimum 5 dBA insertion loss to 16 residences. The total cost and cost-per-residence benefited is $1,060,200 and $66,263, respectively. This barrier is not considered to be reasonable and feasible.

Noise Sensitive Area 4-E
A noise barrier is not considered to be reasonable and feasible because no noise sensitive sites will be impacted.

Noise Sensitive Area 4-F
A noise barrier is not considered to be reasonable and feasible due to the proximity of Douglas Avenue, which does not allow a barrier to meet the minimum insertion loss requirements.

Noise Sensitive Area 4-G
A noise barrier 7400 feet long, with an average height of 16.6 feet will provide a minimum 5 dBA insertion loss to 73 residences. The total cost and cost-per-residence benefited is $2,456,800 and $33,655, respectively. This barrier is not considered to be reasonable and feasible.

Noise Sensitive Area 4-H
A noise barrier 2400 feet long, with an average height of 20.0 feet will provide a minimum 5 dBA insertion loss to 6 residences. The total cost and cost-per-residence benefited is $960,000 and $160,000, respectively. This barrier is not considered to be reasonable and feasible.

Noise Sensitive Area 4-I
A noise barrier 6120 feet long, with an average height of 17.8 feet will provide a minimum 5 dBA insertion loss to 264 residences. The total cost and cost-per-residence benefited is $2,178,720 and $8,253, respectively. This barrier is considered to be reasonable and feasible.
SECTION THREE

Noise Abatement

**Noise Sensitive Area 4-J**
A noise barrier 2200 feet long, with an average height of 18.9 feet will provide a minimum 5 dBA insertion loss to 36 residences. The total cost and cost-per-residence benefited is $831,600 and $23,100, respectively. This barrier is considered to be reasonable and feasible.

**Noise Sensitive Area 4-K**
A noise barrier 5600 feet long, with an average height of 21.9 feet will provide a minimum 5 dBA insertion loss to 19 residences. The total cost and cost-per-residence benefited is $2,452,800 and $129,095, respectively. This barrier is not considered to be reasonable and feasible.

**Noise Sensitive Area 4-L**
A noise barrier 4850 feet long, with an average height of 19.8 feet will provide a minimum 5 dBA insertion loss to 26 residences. The total cost and cost-per-residence benefited is $1,920,600 and $73,869, respectively. This barrier is not considered to be reasonable and feasible.

**Noise Sensitive Area 4-M**
A noise barrier 6940 feet long, with an average height of 18 feet will provide a minimum 5 dBA insertion loss to 61 residences. The total cost and cost-per-residence benefited is $2,498,400 and $40,957, respectively. This barrier is not considered to be reasonable and feasible.

**Noise Sensitive Area 5-A**
A noise barrier is not considered to be reasonable and feasible due to the proximity of International Boulevard, which does not allow a barrier to meet the minimum insertion loss requirements.

**Noise Sensitive Area 5-B**
A noise barrier 2210 feet long, with an average height of 22.3 feet will provide a minimum 5 dBA insertion loss to 12 residences. The total cost and cost-per-residence benefited is $985,660 and $82,138, respectively. This barrier is not considered to be reasonable and feasible.

**Noise Sensitive Area 5-C**
A noise barrier 2650 feet long, with an average height of 22.6 feet will provide a minimum 5 dBA insertion loss to 12 residences. The total cost and cost-per-residence benefited is $1,197,800 and $99,817, respectively. This barrier is not considered to be reasonable and feasible.

**Noise Sensitive Area 6-A**
A noise barrier 7450 feet long, with an average height of 19.8 feet will provide a minimum 5 dBA insertion loss to 31 residences. The total cost and cost-per-residence benefited is $2,950,200 and $95,168, respectively. This barrier is not considered to be reasonable and feasible.

**Noise Sensitive Area 6-B**
A noise barrier 3080 feet long, with an average height of 19 feet will provide a minimum 5 dBA insertion loss to 13 residences. The total cost and cost-per-residence benefited is $1,170,400 and $90,031, respectively. This
Figure 3.4.1
Noise Barrier Locations

I-4 PD&E Study - Section 2
Segment 1 of 6
Figure 3.4.1
Noise Barrier Locations
I-4 PD&E Study - Section 2
Segment 2 of 6
Figure 3.4.1
Noise Barrier Locations

<table>
<thead>
<tr>
<th>Location</th>
<th>Details</th>
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<tbody>
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Scale in Miles

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Figure 3.4.1
Noise Barrier Locations

1-4 PD&E Study - Section 2
Segment 4 of 6