



## NOISE STUDY REPORT - DRAFT

### SR 9/I-95 AT SR 80/SOUTHERN BOULEVARD PROJECT DEVELOPMENT & ENVIRONMENT STUDY

(SR 80 MP 19.1 to 20.4 and I-95 MP 24.3 to 25.3)

ETDM No.: 14183/ FAP No.: TBD  
Financial Project ID: 435516-1-22-02  
Palm Beach County



Prepared For:  
FDOT District Four 3400 W. Commercial Blvd.  
Ft. Lauderdale, FL 33309

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. 327 and a memo of understanding dated December 14, 2016 and executed by FHWA and FDOT.

September 2017





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September 2017





Noise Study Report  
SR 9/I-95 at SR 80/Southern Boulevard PD&E Study

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## 1.0 Introduction

The Florida Department of Transportation (FDOT) District Four is conducting a Project Development and Environment (PD&E) Study to evaluate alternatives for the ultimate improvements of the State Road (SR) 9/Interstate I-95 (I-95) and SR 80/Southern Boulevard Interchange in Palm Beach County, Florida. As part of this PD&E Study, a traffic noise study was performed. The traffic noise study was performed in accordance with 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 the FDOT's PD&E Manual, Part 2, Chapter 17, Highway Traffic Noise (July 27, 2016).

The primary objectives of this noise study were to:

- Describe the existing site conditions including noise sensitive land uses within the project limits;
- Document the methodology used to conduct the noise assessment;
- Assess the significance of traffic noise levels on noise sensitive sites for the No-Build and Build Alternatives; and
- Evaluate abatement measures for those noise sensitive sites that, under the Recommended Build Alternative, approach or exceed the Noise Abatement Criteria (NAC) set forth by the FDOT and Federal Highway Administration (FHWA) or where a substantial increase occurs.

Secondary objectives of this study included the consideration of construction noise and vibration impacts as well as the development of noise level isopleths, which can be used in the future by local municipal and county government agencies to identify compatible land uses along the project roadways.

The purpose of this Noise Study Report is to present the findings of the traffic noise analysis. The information within this report is also intended to provide the technical support for the findings presented in the Preliminary Engineering Report (PER) and Type 2 Categorical Exclusion Environmental Determination Form.



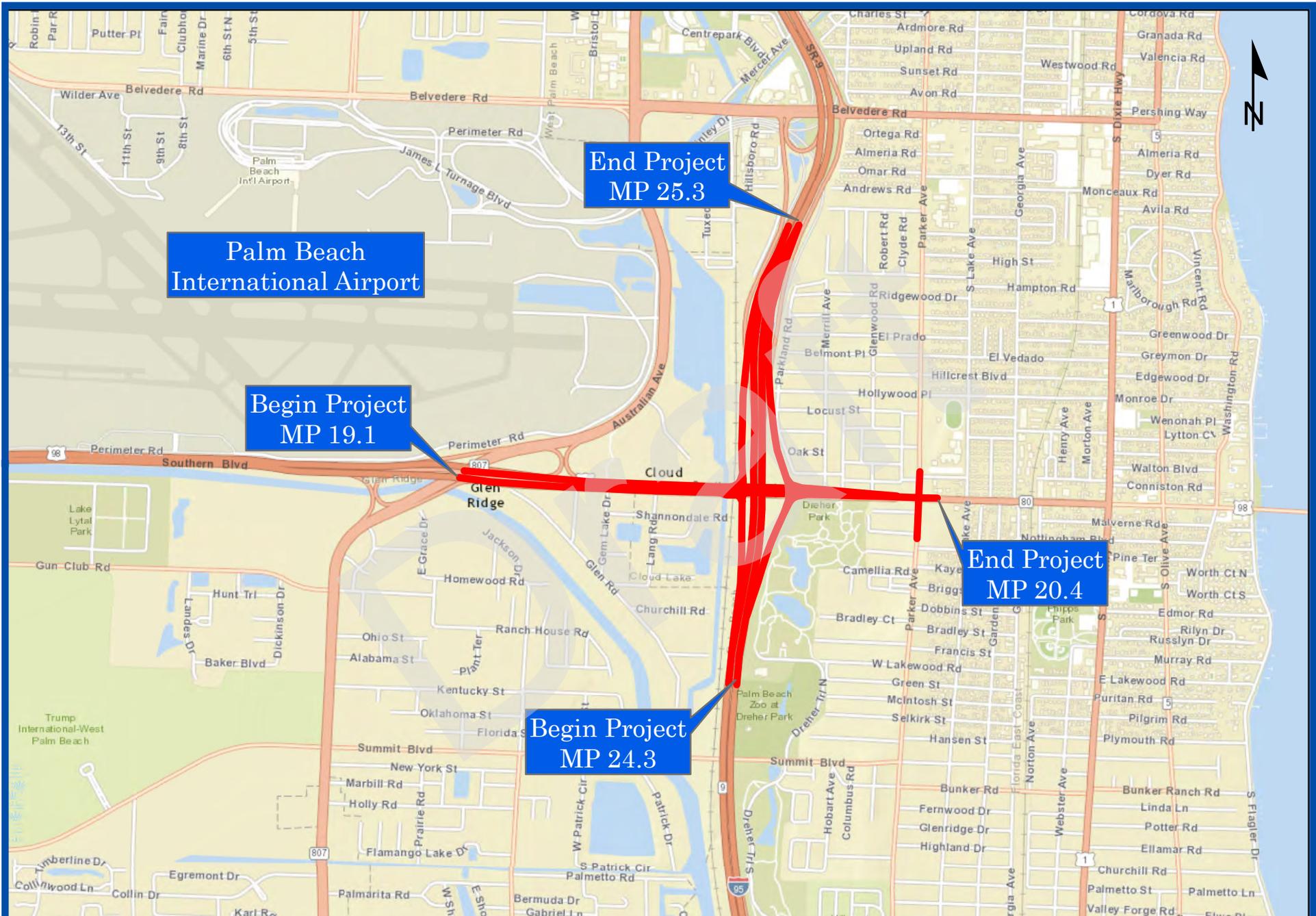
## 1.1 Project Description

The SR 9/I-95 and SR 80/Southern Boulevard Interchange was one of 17 interchanges studied as part of the *I-95 Interchange Master Plan* that reexamined the 2003 *I-95 Interchange Master Plan Study* and the State Road 9 (SR 9) / I-95 mainline project. That project added a High Occupancy Vehicle (HOV) lane and auxiliary lanes from south of Linton Boulevard to north of PGA Boulevard in Palm Beach County and also included minor improvements to eight interchanges. Overall, the I-95 Interchange Master Plan recommended new short-term and long-term improvements to interchanges based on changes in traffic volumes and updated design standards. The SR 9/I-95 at SR 80/Southern Boulevard interchange is located between the Forest Hill Boulevard interchange (1.45 miles to the south), and the Belvedere Road interchange (1.01 miles to the north), and is in close proximity to multiple municipalities, including the City of West Palm Beach, Towns of Cloud Lake and Glen Ridge, and unincorporated Palm Beach County. **Figure 1.1.1** depicts the project location.

This project proposes to improve interchange operations to address traffic spillback onto SR 9/I-95, reduce congestion, and increase safety. This project will be developed with consideration to the potential extension of the I-95 Express Lanes through this interchange area. Based upon the traffic operations analysis conducted for the interchange and adjacent signalized intersections [as documented in the *I-95 (SR-9) Interchange at Southern Boulevard (SR-80) in Palm Beach County Interchange Concept Development Report*], the following preliminary short-term and long-term improvements have been identified for this interchange:

2020 Opening Year (Short-Term) Recommended Improvements:

- Add an additional eastbound right-turn lane (dual) on the SR 80/Southern Boulevard bridge at the SR 9/I-95 southbound on-ramp; and
- Add an additional right-turn lane (dual) on the SR 9/I-95 northbound off-ramp.



**SR 9/I-95 at SR 80/Southern Boulevard Interchange**  
**Project Development and Environment Study Financial**  
**Project ID: 435516-1-22-02, ETDM No: 14183**

**Figure 1.1.1**  
**Project Location Map**

### 2040 Design Year (Long-Term) Recommended Improvements:

- Add an eastbound-to-northbound single lane flyover ramp to access the SR 9/I-95 northbound on-ramp;
- Add a westbound-to-southbound single lane flyover ramp to access the SR 9/I-95 southbound on-ramp;
- Realign the SR 9/I-95 northbound off-ramp approach to SR 80/Southern Boulevard and add an additional left-turn lane (quadruple) and right-turn lane (dual);
- Add two additional right-turn lanes (triple) to the SR 9/I-95 southbound off-ramp;
- Add an additional eastbound and westbound left-turn lane (dual) on SR 80/Southern Boulevard at Parker Avenue;
- Add an additional northbound left-turn lane (dual) on Parker Avenue at SR 80/Southern Boulevard; and
- Add an exclusive southbound right-turn lane on Parker Avenue at SR 80/Southern Boulevard.

This PD&E Study evaluated the improvements listed above, the No-Build Alternative, and two additional Build alternatives for the interchange.

## 1.2 Project Purpose

The purpose of this study is to enhance overall traffic operations at the existing interchange of SR 9/I-95 and SR 80/Southern Boulevard by providing improvements to achieve acceptable Levels of Service (LOS) at the interchange in the future condition (2040 Design Year). Conditions along SR 80/Southern Boulevard are anticipated to deteriorate below acceptable LOS standards if no improvements occur by 2040; the interchange will have insufficient capacity to accommodate the projected travel demand.

## 1.3 Project Need

The need for the project is based on the need to improve operational capacity, improve overall traffic operations in order to accommodate future growth and development, improve safety conditions, and enhance emergency evacuation and response times.



This project is anticipated to improve traffic operations at the SR 9/I-95 and SR 80/Southern Boulevard interchange and study area roadways/intersections by implementing operational and capacity improvements to meet the future travel demand projected as a result of Palm Beach County population and employment growth.

Based upon the traffic operations analysis conducted for the SR 9/I-95 at SR 80/Southern Boulevard interchange and adjacent signalized intersections [documented in the *I-95 (SR-9) Interchange at Southern Boulevard (SR-80) in Palm Beach County Interchange Concept Development Report*], the existing AM and PM peak hour traffic conditions for the four study intersections along SR 80/Southern Boulevard range from LOS A to D in the AM peak hour, and from LOS B to D in the PM peak hour. Without interchange improvements, the future design year (2040) AM peak LOS will decline and range from B to F and PM peak hour LOS will range from C to F. Although all of the intersections along SR 80/Southern Boulevard operate at LOS D or better under existing conditions, it should be noted that several of the individual through and turning movements at the intersections (which include the SR 9/I-95 on/off-ramp approaches) operate at LOS F during both the AM and PM peak periods. Without the proposed improvements, the intersections are projected to experience excessive delays and queuing, and operate below acceptable LOS standards by the 2040 Design Year.

Population within the vicinity of the interchange is anticipated to increase by approximately 12% from 2005 to 2035 with the majority of the growth occurring southeast of the SR 9/I-95 at SR 80/Southern Boulevard interchange. Employment is expected to increase by approximately 784% from 2005 to 2035 with major increases in the areas located northeast and southwest of the interchange. These projections are based on data derived from the enhanced Southeast Regional Planning Model (SERPM) version 6.5, Managed Lanes Model (upgraded to include specific subarea improvements for the I-95 Interchange Master Plan). As such, the proposed improvements will be critical in supporting growth within the vicinity of the interchange and the overall vision of Palm Beach County.





The *I-95 (SR-9) Interchange at Southern Boulevard (SR-80) in Palm Beach County Interchange Concept Development Report (ICDR)* (dated February 2014) included a safety analysis of the project area. The total number of crashes in the three-year period 2010 through 2012 was 119, with 31% of those being rear-end type crashes, the predominant type of incident. The FDOT's high crash location reports for the period 2010 through 2012 identify locations that have a higher crash rate as compared to crash rates for similar statewide roadways. Based on FDOT's 2011 high crash location report, the SR 9/I-95 at SR 80/Southern Boulevard interchange is considered a high crash location.

The proposed improvements are anticipated to provide additional through and turn lanes, as well as interchange ramp improvements, to help reduce conflict points and the potential occurrence of collisions at the interchange.

SR 9/I-95 and SR 80/Southern Boulevard serve as part of the emergency evacuation route network designated by the Florida Division of Emergency Management. Also designated by Palm Beach County as evacuation facilities, SR 9/I-95 and SR 80/Southern Boulevard are critical in facilitating traffic flows during emergency evacuation periods as they connect other major arterials and highways of the state evacuation route network. This project is anticipated to improve emergency evacuation capabilities by enhancing connectivity and accessibility to SR 9/I-95 and other major arterials designated on the state evacuation route network from the west and east, and increase the operational capacity of traffic that can be evacuated during an emergency event.

#### 1.4 Description of Existing Conditions

SR 9/I-95 is currently a ten-lane, divided interstate freeway from north of the Congress Avenue interchange to north of the PGA Boulevard interchange providing four general purpose lanes and one High Occupancy Vehicle (HOV) lane in each direction. Auxiliary lanes are also provided in both the northbound and southbound directions on various segments throughout the corridor. The posted speed on this segment of I-95 is 65 miles per hour (mph). The existing right-of-way varies as it approaches the interchange, but the typical right-of-way ranges from approximately 300 to 600 feet. SR 9/I-95 serves an important role in facilitating the north-south movement of traffic in Southeast Florida as





Figure 1.4.2: Existing Typical Section for SR 80/Southern Boulevard West of I-95

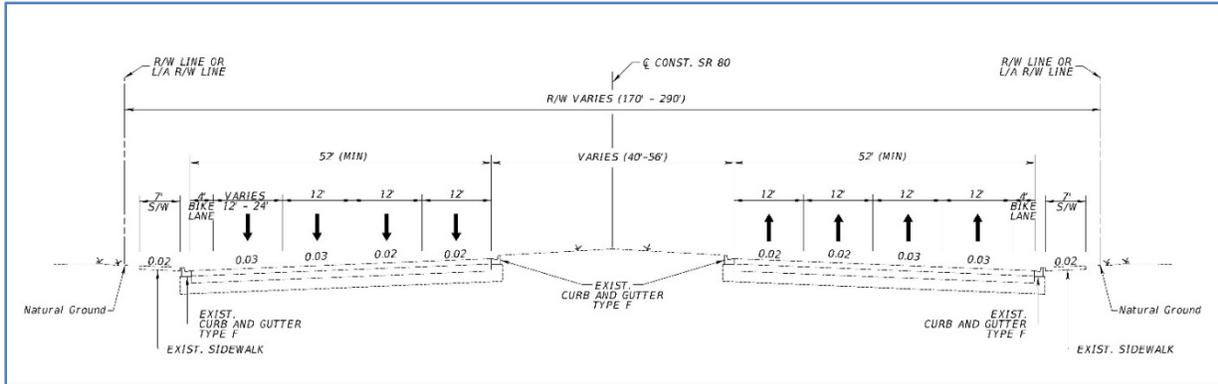
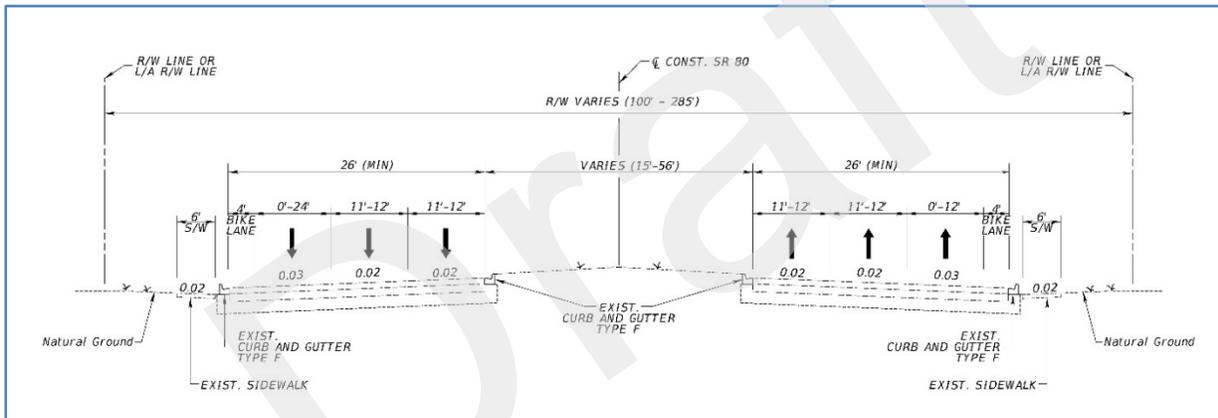


Figure 1.4.3: Existing Typical Section for SR 80/Southern Boulevard East of I-95



## 1.5 Project Alternatives

### 1.5.1 No-Build Alternative

The No-Build Alternative assumes no proposed improvements and serves as a baseline for comparison against the other alternatives. This is consistent with requirements of the NEPA and FHWA guidelines. The No-Build Alternative includes on-going construction projects and all funded or programmed improvements scheduled to be opened to traffic during the analysis years being considered. The No-Build Alternative, as its name implies, retains the existing roadway and bridge characteristics. Under this scenario, the existing SR 80 corridor would not be improved and conditions would continue to deteriorate. The

No-Build Alternative has certain advantages and disadvantages. The advantages of the No-Build Alternative include:

- No expenditure of public funds;
- No disruption or temporary impacts (i.e., air, noise, vibration, or travel patterns) due to construction activities;
- No right-of-way acquisition; and
- Elimination of public concern regarding future lane configuration, noise, and aesthetic impacts.

The disadvantages of the No-Build Alternative include:

- Does not meet the projects purpose and need;
- Increased vehicular congestion and delay, which leads to increased travel costs and driver frustration;
- Increased safety concerns, particularly at the ramp intersections and Gem Lake Drive;
- Increased emergency response and evacuation time; and
- Decreased air quality and increased noise levels.

If no improvements are made current conditions will continue to deteriorate. Consequently, the No-Build Alternative does not satisfy the purpose and need for this project.

### 1.5.2 Build Alternatives

The following paragraphs summarize the various build alternatives evaluated as a part of this study. Originally, four build alternatives were considered: Alternatives 1, 2, 3, and 4. Build Alternative 2, which proposed dual flyovers at the third and fourth levels, was eliminated from further evaluation due to public opinion and Section 4(f) impacts at Dreher Park (see PER for detailed information) and therefore, is not described in this document. Build Alternatives 1, 3, and 4 have many similar elements that are listed below. The remaining paragraphs describe the unique features of the three proposed build alternatives.

Elements that are common and identical in each of the build alternatives include:

- Proposed signalization optimization at the ramp intersections and the downstream intersections east and west of the interchange (Gem Lake Drive and Parker Avenue);
- Gem Lake remains a signalized, full median opening;
- The directional median opening to access Lang Road via westbound Southern Boulevard is proposed to be closed due to proposed flyover ramps in the median of Southern Boulevard;
- The southbound I-95 exit ramp will provide three right turn lanes to westbound Southern Boulevard and two left turn lanes to eastbound Southern Boulevard; both of these movements will be signal controlled;
- The southbound I-95 entrance ramp will accommodate two eastbound right turn lanes and two westbound left turn lanes; both of these movements will be signal controlled;
- The northbound I-95 entrance ramp will retain the existing configuration of a single free-flow, right turn lane from westbound Southern Boulevard;
- The northbound I-95 exit ramp proposes to provide three at-grade, left turn lanes to westbound Southern Boulevard and two right turn lanes to the eastbound direction; these movements will be signal controlled;
- At the intersection with Parker Avenue, a dedicated, right turn lane will be added along eastbound Southern Boulevard and the existing left turn lane storage will be increased. On the south leg of Parker Avenue, dual left turn lanes are proposed to westbound Southern Boulevard along with one through lane and one combined through and right turn lane;
- No right-of-way acquisition is proposed in the historic Vedado and Hillcrest neighborhoods, Dreher Park, or along Parker Avenue;
- In areas where alternatives are proposing reconstruction, seven-foot, buffered bike lanes are planned. Areas of resurfacing propose four-foot bike lanes where possible. The exception is along Parker Avenue, where bike lanes are not proposed due to right-of-way constraints and consistency with existing conditions. The implementation of green bike lane markings are also proposed where appropriate.

- As requested by the communities, special emphasis pavement markings have been proposed at pedestrian crossings at all cross walks.

## Typical Sections

The proposed mainline roadway and bridge typical sections are described below. All of the build alternatives share common typical sections, except for the flyovers.

SR 80, west of I-95, will have the following characteristics:

- Four 12-foot travel lanes in each direction;
- 4 to 7-foot bicycle lanes on both sides of SR 80;
- Curb and gutter, inside and outside;
- 6 to 7-foot sidewalks on both sides of the roadway;
- Single lane flyovers with 6-foot inside and outside shoulders located in the existing median area. Alternatives 1 and 3 have a single flyover and Alternative 4 has two flyovers proposed in the median area; and
- Right-of-way varies from 170 to 290 feet.

SR 80, east of I-95, will have the following characteristics:

- At the interchange, three 12-foot travel lanes in each direction that merge to two 12-foot travel lanes east of the interchange area prior to the intersection with Parker Avenue;
- 4-foot bicycle lanes in each direction;
- Curb and gutter, inside and outside;
- 6-foot sidewalks adjacent to the outside curb and gutter;
- 15 to 56-foot landscaped median;
- An 11-foot right-turn lane will be added at the intersection of SR 80 and Parker Avenue; and,
- Right-of-way varies from 100 to 285 feet.

Parker Avenue, south of the intersection of SR 80, will receive minor improvements within the existing right-of-way and have the following characteristics:

- Two 10-foot left-turn lanes, one 11-foot through lane and one 11-foot shared through and right-turn lane in the northbound direction;
- One 11-foot lane in the south bound direction;
- Curb and gutter, inside and outside; and
- 5-foot sidewalks adjacent to the curb and gutter on both sides.

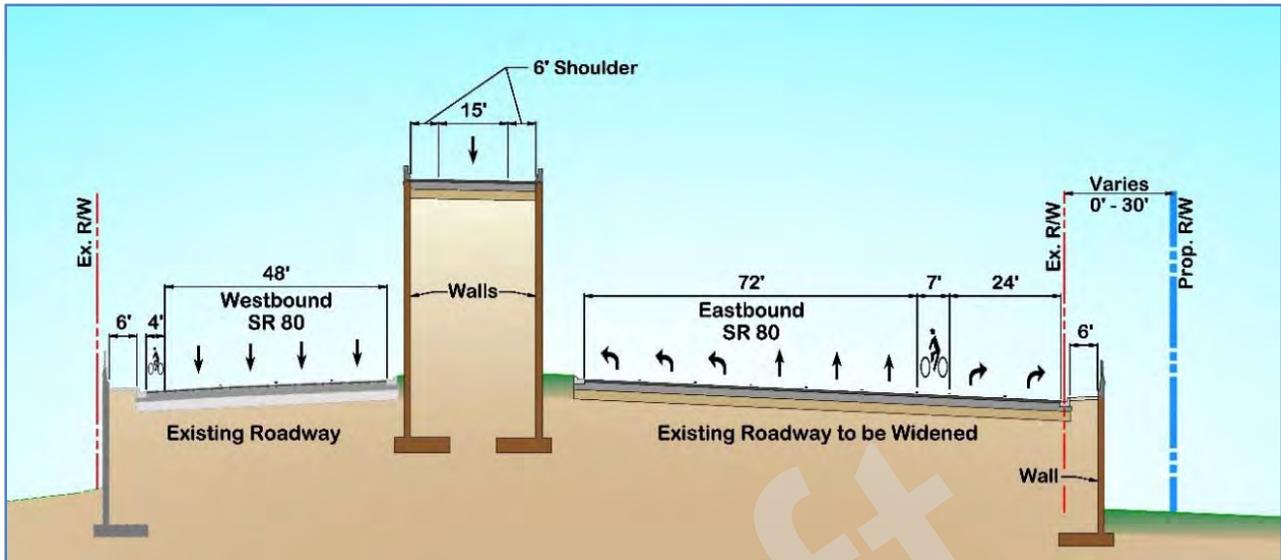
The bridges over I-95 and the railroad will be widened slightly and will share the following characteristics:

- Four 12-foot travel lanes in each direction separated by a concrete median;
- 4 to 7-foot bicycle lane in each direction;
- Curb and gutter, inside and outside;
- 6-foot sidewalks adjacent to the outside curb and gutter; and
- Varying number of turn lanes to access the I-95 entrance ramps.

### Build Alternative 1 (Northbound to Westbound Flyover)

Build Alternative 1 (Northbound to Westbound Flyover) consists of a single flyover ramp from northbound I-95 to westbound Southern Boulevard. The proposed single lane ramp exits I-95 from the east side of the highway, climbs to the third level, crosses over I-95, and turns to the west within the median of Southern Boulevard. The proposed flyover ramp bypasses the intersection of Lang Road, which is proposed to be closed due to the ramp structure, and over Gem Lake Drive, which will remain open. The ramp continues over the existing, at-grade slip ramp that provides access to southbound Australian Avenue/Congress Avenue. The proposed ramp profile ties into the existing profile east of Australian Avenue on the north side of the Southern Boulevard median, merging into the existing westbound Southern Boulevard. Along eastbound Southern Boulevard, three at-grade left turn lanes are proposed to access the northbound I-95 entrance ramp. The southbound I-95 entrance and exit ramps, as well as the eastern portion of SR 80 and Parker Avenue, are proposed as listed above in the common elements. The proposed typical section for Build Alternative 1 is shown below in **Figure 1.5.1**.

Figure 1.5.1: Build Alternative 1 - Proposed SR 80 Typical Section West of I-95



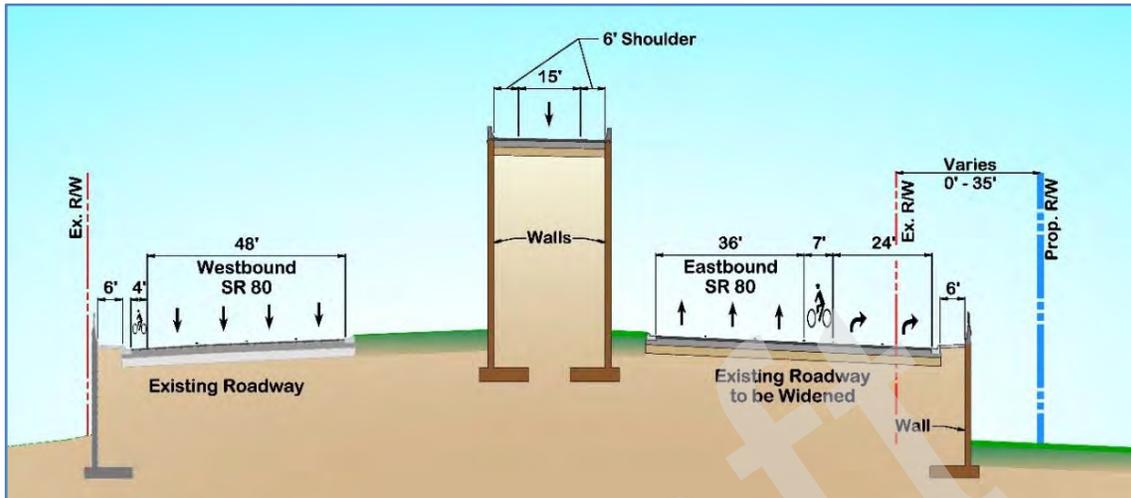
Right-of-way acquisition is proposed for Build Alternative 1 west of I-95 along the north and south sides of the SR 80. On the south side of SR 80, between Gem Lake Drive and Lang Road, an additional right-of-way width of 0 to 22 feet is required for the proposed improvements. Between Lang Road and I-95, 0 to 30 feet of right-of-way is required. On the north side of Southern Boulevard, approximately 0 to 40 feet of additional right-of-way is required for the proposed improvements. Right-of-way in this area would be acquired from the County-owned parcel (currently accommodating County offices and parking) and largely consists of under-utilized parking areas.

### Build Alternative 3 (Eastbound to Northbound Flyover)

Build Alternative 3 consists of a single flyover ramp from eastbound Southern Boulevard to northbound I-95. The ramp then ascends to the third level, crosses over I-95 while turning to the north, and connects with the existing entrance ramp, prior to the braided ramps to the north of the interchange. For vehicles east of the Gem Lake Drive area (i.e.; Town of Cloud Lake) or motorists not wishing to utilize the flyover, two at-grade left turn lanes are proposed to access the northbound I-95 entrance ramp at the existing entrance ramp location. The southbound I-95 entrance and exit ramps, the northbound I-95 exit ramp, and the eastern portion of SR 80, and Parker Avenue are listed as proposed in the

common elements. The proposed typical section for Build Alternative 3 is shown below in **Figure 1.5.2**.

**Figure 1.5.2: Build Alternative 3 - Proposed SR 80 Typical Section West of I-95**

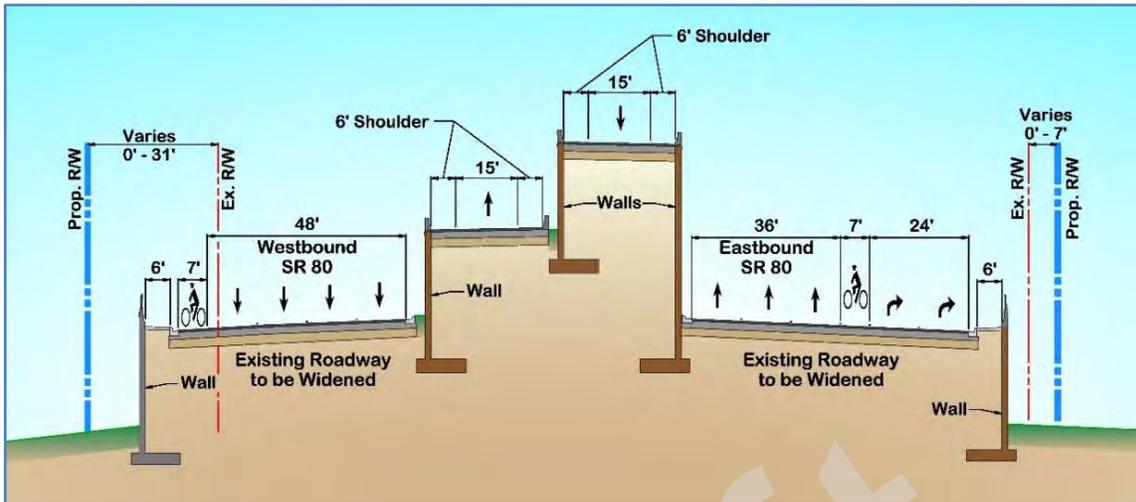


Right-of-way acquisition associated with Build Alternative 3 occurs on the west side of I-95 along the south side of Southern Boulevard between Gem Lake Drive and I-95. Proposed improvements will require approximately 12 to 40 feet of additional right-of-way.

### **Build Alternative 4 (Northbound to Westbound Flyover (Third Level) & Eastbound to Northbound Flyover (Third Level))**

Build Alternative 4 essentially combines Build Alternatives 1 and 3 to provide dual third level flyovers: one from northbound I-95 to westbound Southern Boulevard, similar to Build Alternative 1, and one from eastbound Southern Boulevard to northbound I-95, similar to Build Alternative 3. Both flyover ramps consist of a single lane and are at the third level, thereby minimizing visual impacts, construction cost, and constructability issues. The method in which dual third level flyovers is accomplished is by shifting the Southern Boulevard alignment to the north and braiding the eastbound to northbound entrance under the elevated northbound to westbound ramp to begin its alignment (at-grade) at Gem Lake Drive. This entrance will essentially align beside the existing westbound slip ramp that provides access to southbound Congress Avenue. The proposed typical section for Build Alternative 4 is shown below in **Figure 1.5.3**.

Figure 1.5.3: Build Alternative 4 - Proposed SR 80 Typical Section West of I-95



Build Alternative 4 requires additional right-of-way along both the north and south sides of Southern Boulevard to the west of I-95. On the north side of SR 80, in the area of the County-owned parcel, approximately 0 to 56 feet of right-of-way would be required to accommodate the improvements. Right-of-way in this area consists of mostly underutilized parking areas for County offices and an existing hotel. On the south side of Southern Boulevard, between Gem Lake Drive and Lang Road, approximately 12 to 28 feet of additional right-of-way is needed. Parcels affected include one commercial property and three vacant parcels. Between Lang Road and I-95 approximately 0 to 7 feet of right-of-way is required from two residential properties but would not result in any relocations.

### 1.5.3 Recommended Build Alternative

Alternative 4 - Northbound to Westbound Flyover (Third Level) & Eastbound to Northbound Flyover (Third Level) has been selected as the Recommended Build Alternative. The recommended improvements associated with Build Alternative 4 are shown in **Figure 6.9.1** in **Appendix A** from the PER and the Conceptual Plan sheets in **Appendix A** also from the PER. This alternative provides dual third level flyovers: one from northbound I-95 to westbound Southern Boulevard, and one from eastbound SR 80/Southern Boulevard to northbound I-95.



The proposed northbound-to-westbound single lane flyover begins to develop on the east side of I-95 and ascends to the third level. The proposed ramp crosses I-95 and turns to the west along Southern Boulevard, by-passing the intersections of Lang Road and Gem Lake Drive. The ramp continues over the existing, at-grade slip ramp that accesses southbound Australian Avenue/Congress Avenue and the eastbound-to-northbound ramp entrance, eventually matching the existing profile east of Australian Avenue and merging into the inside lane of westbound Southern Boulevard. Vehicles wishing to access the County property and the Towns of Glen Ridge and Cloud Lake will utilize the three at-grade, left turn lanes proposed at the northbound I-95 exit ramp. Access to the Town Cloud Lake, formerly by way of Lang Road, would be via the intersection of Gem Lake Drive. Travelers could turn left into Gem Lake Drive, or a U-turn maneuver could be executed with eastbound access into Lang Road.

The second flyover proposed in Alternative 4 consists of a single lane flyover ramp from eastbound Southern Boulevard to northbound I-95. The proposed ramp braids under the northbound-to-westbound flyover and develops on the north side of the median of Southern Boulevard, east of the Gem Lake Drive intersection and ascends to the third level, crosses over I-95 while turning to the north and connects with the existing northbound I-95 entrance ramp. As described above with Alternative 3, vehicles east of the Gem Lake Drive area (i.e., Town of Cloud Lake) or motorists not wishing to utilize the flyover, two at-grade left turn lanes are proposed to access the northbound I-95 entrance ramp at the existing entrance ramp location. The southbound I-95 entrance and exit ramps, the northbound I-95 exit ramp and the eastern portion of SR 80 and Parker Avenue, are proposed as listed in the common elements.

As described in Section 1.5.2, Build Alternative 4 requires additional right-of-way along both the north and south sides of SR 80/Southern Boulevard to the west of I-95. On the north side of SR 80, approximately 0 to 56 feet of right-of-way would be required to accommodate the improvements. On the south side of Southern Boulevard, between Gem Lake Drive and Lang Road, approximately 12 to 28 feet of additional right-of-way is needed. Between Lang Road approximately 0 to 7 feet of right-of-way is required from two residential properties but would not result in any relocations.



## 2.0 Methodology

This study was conducted based on the methodology described in the FDOT's PD&E Manual, Chapter 17, Noise (July 27, 2016) and in accordance with Title 23 CFR (Code of Federal Regulations) Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (July 13, 2010). The noise study involved the following procedures:

- Identification of Noise Sensitive Receptor Sites (see Section 3.1);
- Field Measurement of Noise Levels and Noise Model Validation (see Section 3.2);
- Prediction of Existing and Future Noise Levels and Assessment of Traffic Noise Impacts (see Section 3.3); and
- Consideration of Noise Barriers as a Noise Abatement Measure (see Section 3.4).

The traffic noise model, the noise metrics, and the traffic data used in this study are described in the following sections.

### 2.1 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 if warranted. TNM 2.5 was used because it is FHWA's latest approved noise model. This model 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, structures (houses, trees, etc.), ground surface type (hard or soft), and topography.

### 2.2 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 2.2.1** as a frame of reference.

**Table 2.2.1: Sound Levels of Typical Noise Sources and Environments**

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL dB(A)	COMMON INDOOR ACTIVITIES
Jet Fly-over at 1000 ft	---110---	Rock Band
Gas Lawn Mower at 3 ft	---100---	
Diesel Truck at 50 ft, at 50 mph	---90---	Food Blender at 1 m (3 ft)
Noise Urban Area (Daytime)	---80---	Garbage Disposal at 1 m (3 ft)
Gas Lawn Mower at 100 ft	---70---	Vacuum Cleaner at 10 ft
Commercial Area	---60---	Normal Speech at 3 ft
Heavy Traffic at 300 ft	---50---	Large Business Office
Quiet Urban Daytime	---40---	Dishwasher Next Room
Quiet Urban Nighttime	---30---	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	---20---	Library
Quiet Rural Nighttime	---10---	Bedroom at Night, Concert Hall (Background)
Lowest Threshold of Human Hearing	---0---	Lowest Threshold of Human Hearing

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

## 2.3 Traffic Data

Traffic data used in this noise study was obtained from the project’s Interchange Modification Report (IMR) (dated February 2017) and the LOS C volumes contained in the generalized tables of FDOT’s Quality/Level of Service Handbook (updated 2012). Traffic volumes used to predict noise levels in this study 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 of 2040. **Table 2.3.1** in **Appendix B** summarizes the peak hour demand traffic volumes and LOS C volumes for the project corridor and the traffic data used in the prediction of traffic noise levels by vehicle type for the Existing conditions, No-Build Alternative, and the Build Alternative. Figures depicting the peak hour volumes for



the Existing conditions and the No-Build and Build Alternatives from the IMR are also included in **Appendix B (Figures 3-2, 5-3, and 6-4, respectively)**.

## 2.4 Existing and Future Land Use

Existing land uses surrounding the interchange consists of developed parcels/properties, such as residential, institutional, commercial, light industrial facilities, and transportation as well as recreation/open space (see **Figure 2.4.1**). The Palm Beach International Airport is located in the northwest quadrant of the interchange.

Palm Beach County Future Land Use Map shows only minor changes in land use, with some existing commercial and institutional uses designated as “Mixed Use” (see **Figure 2.4.2**). The areas east of I-95 and Southern Boulevard are identified as residential and institutional land uses. The area west of the interchange is identified as utility/transportation, commercial, residential, industrial, and conservation land uses.





Palm Beach International Airport

Begin Project MP 19.1

End Project MP 25.3

SOUTHERN BLVD

End Project MP 20.4

Begin Project MP 24.3

**Legend**

**Existing Land Use**

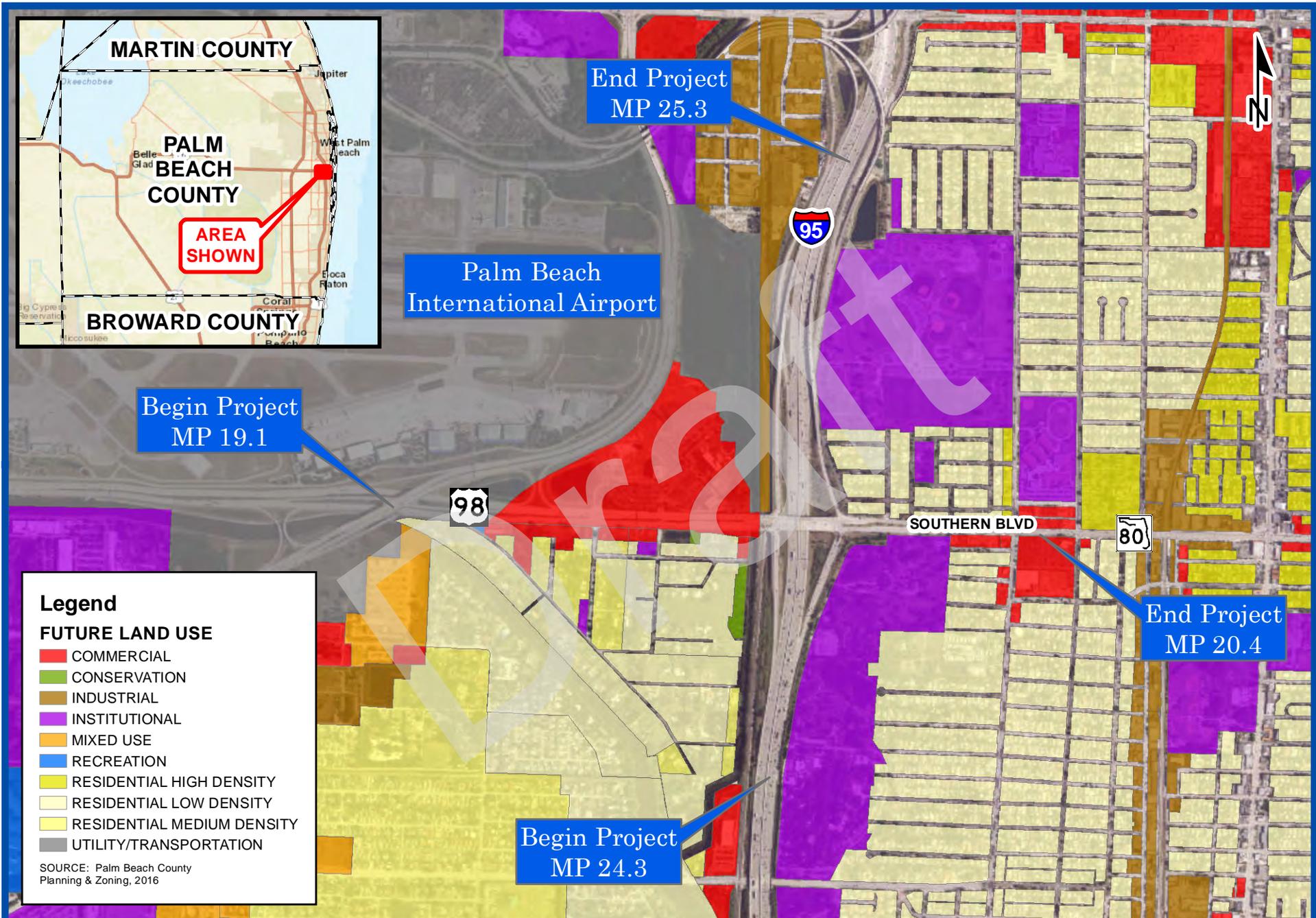
- Agriculture
- Commercial
- Congregate Living
- Industrial
- Institutional
- Recreation/Open Space
- Residential
- Transportation/Utilities
- Vacant
- Water

SOURCE: Palm Beach County Planning & Zoning, 2013



SR 9/I-95 at SR 80/Southern Boulevard Interchange  
 Project Development and Environment Study Financial  
 Project ID: 435516-1-22-02, ETDM No: 14183

Figure 2.4.1  
 Existing Land Use Map



**Legend**

**FUTURE LAND USE**

- COMMERCIAL
- CONSERVATION
- INDUSTRIAL
- INSTITUTIONAL
- MIXED USE
- RECREATION
- RESIDENTIAL HIGH DENSITY
- RESIDENTIAL LOW DENSITY
- RESIDENTIAL MEDIUM DENSITY
- UTILITY/TRANSPORTATION

SOURCE: Palm Beach County Planning & Zoning, 2016



**SR 9/I-95 at SR 80/Southern Boulevard Interchange  
Project Development and Environment Study**  
Financial Project ID: 435516-1-22-02, ETDM No: 14183

**Figure 2.4.2  
Future Land Use Map**

## 3.0 Traffic Noise Analysis

### 3.1 Noise Sensitive Receptor Sites

The FHWA has established NAC for land use activity categories which are presented in **Table 3.1.1**. Maximum noise threshold levels, or criteria levels, have been established for five of the seven activity categories. These criteria determine when an impact occurs and when consideration of noise abatement is required. Noise abatement measures must be considered when predicted noise levels approach or exceed the NAC levels or when a substantial noise increase occurs. 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.

The land uses within the project corridor were evaluated to identify the noise sensitive receptor sites that may be impacted by traffic noise associated with the proposed improvements. 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, including 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.



Table 3.1.1: Noise Abatement Criteria [Hourly A-Weighted Sound Level-decibels (dB(A))]

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

(Based on Table 1 of 23 CFR Part 772)

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

<sup>2</sup> 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.



Existing land uses categorized by FHWA's Noise Activity Categories within the project area are depicted in **Figure 3.1.1**. The noise sensitive sites potentially impacted by the project include:

- Single and multi-family residences (Category B) in the Towns of Glen Ridge and Cloud Lake, Ridgeland Park subdivision, and in the Vedado-Hillcrest communities;
- Recreational facilities (Category C) associated with Palm Beach Atlantic University Athletic Campus, Dreher Park North, Palm Beach Zoo, Flury Park, Renaissance Charter School, Cloud Lake Conservation Area, and Holy Cross Church/School;
- Interior areas of Shambhala Meditation Center, South Florida Science Center and Aquarium, and Universal Church (Category D); and
- Recreational and exterior areas of use associated with the Hilton Palm Beach Airport Hotel and Capri Restaurant (Category E).

Office buildings along the corridor (i.e.; those associated with the Palm Beach County Buildings, north of SR 80/Southern Boulevard and west of I-95) do not have any exterior areas of use that could be potentially impacted by the project. Vedado and Conniston Parks are outside the noise impact area of the project and were, therefore, not evaluated.

Representative receptor sites were used in the TNM inputs to estimate noise levels associated with existing and future conditions within the project limits. These sites were chosen based on noise sensitivity, roadway proximity, anticipated impacts from the proposed project, and homogeneity (i.e., the site is representative of other nearby sites). For single family residences, traffic noise levels were predicted at the edge of the dwelling unit closest to the nearest primary roadway. For other noise sensitive sites that may be impacted, traffic noise levels were predicted where the exterior activity occurs. For the prediction of interior noise levels, receptor sites were placed ten feet inside the building at the edge closest to the roadway. Building noise reduction factors identified in Table 17.2 in Part 2, Chapter 17 of the PD&E Manual and window conditions were used to estimate noise reduction due to the physical structure. The locations of the representative sites are presented in **Figure 3.3.1** and are described in **Table 3.3.1** which are located at the end of Section 3.3. **Table 3.3.1** lists the representative noise sensitive receptors by general area,



Palm Beach International Airport

Begin Project MP 19.1

End Project MP 25.3

Hilton Palm Beach Airport

Palm Beach Atlantic University Athletic Campus

Conniston Middle School

Vedado Park Community Center

Universal Church

SOUTHERN BLVD

End Project MP 20.4

Holy Cross Church/School

Publix

Dreher Park North

Begin Project MP 24.3

South Florida Science Center and Aquarium

Palm Beach Zoo

Renaissance Charter School

East Transportation Facility and Administrative Offices

Town of Glen Ridge

Town of Cloud Lake

Cloud Lake Conservation Area

Glen Ridge Town Hall/Park

Kingdom Hall of Jehovah's Witness

Flury Park

Shambhala Meditation

**Legend**

Existing Noise Barriers

**Existing Land Use**

**Noise Activity Category**

- B: Residential
- C: Sensitive Developed Uses
- D: Institutional (Interior)
- E: Potentially Sensitive Developed Uses
- F: Other Nonsensitive Uses

SOURCE: Palm Beach County Planning and Zoning Department, 2013



approximate location, number of sites represented, and the approximate distance from the center of the nearest existing and proposed nearest travel lanes. Each of the representative receptor sites were given a unique designation or label (e.g., GR1).

### 3.2 Field Measurement of Noise Levels and Model Validation

Noise measurements were taken at nine representative locations within the project limits to verify that TNM-predicted existing levels are representative of actual levels along I-95 and SR 80/Southern Boulevard and to confirm that traffic noise is the main or dominant source. Due to the number of sites monitored and to avoid inclement weather conditions, noise measurements were performed on two different dates, August 26, 2015 and September 12, 2016. Noise measurements were taken at Monitoring Sites MS-1 through MS-5 on August 26, 2015. These five monitoring sites were located south of SR 80/Southern Boulevard and on the east and west sides of I-95 to represent areas within the Palm Beach Zoo and Dreher Park North and the residences within the Town of Glen Ridge. Noise measurements were taken at Monitoring Sites MS-6 through MS-9 on September 12, 2016. These four monitoring sites were located north of SR 80/Southern Boulevard and on the east side of I-95 within the Hillcrest and Vedado Subdivision. The locations of the nine monitoring sites are described in **Table 3.2.1** in **Appendix C** and depicted in **Figure 3.3.1** which is located at the end of Section 3.3. In addition to highway traffic noise, dominant sources affecting the project area include plane arrival and departure noise from Palm Beach International Airport and railway noise from the South Florida Rail Corridor.

The noise level monitoring was completed using Larson-Davis Model 870 sound-level analyzers, in accordance with the methodology established by the FHWA and documented in Report No. DP-96-046, *Measurement of Highway-Related Noise: Final Report*, May 1996. The A-weighted frequency scale was used and the sound meter was calibrated to 114 dB(A) using a Larson-Davis Model CA250 sound-level calibrator. Monitoring was generally conducted for three 10-minute intervals at each site with the microphone approximately 5 feet above the land surface.

Traffic information, such as number of passenger cars and trucks and average speeds, were collected at the time of noise monitoring. A K15-K Doppler Radar Gun was used to obtain

average operating speeds for cars, medium trucks, heavy trucks, buses, and motorcycles. Since all noise levels in this report are based on a 1-hour period, the field-recorded traffic volumes were adjusted upward to reflect hourly volumes. The dates, times, traffic data, and the measured and TNM-predicted noise levels are presented in **Table 3.2.1** in **Appendix C**.

To validate the computer noise model, the TNM-predicted noise levels for Monitoring Sites MS-1 through MS-9 were compared to measured noise levels. The average difference between TNM-predicted levels and the monitored levels was 1.5 dB(A). When measured noise levels are within +/- 3.0 dB(A) of the computer-predicted levels, the model is considered validated. All of the measured noise levels were within +/- 3.0 dB(A) of the TNM-predicted levels (see **Table 3.2.1** in **Appendix C**). Because the TNM-predicted noise levels are within +/- 3.0 dB(A) of the measured noise levels, the model has been validated and is considered acceptable for predicting existing and future traffic noise levels.

### 3.3 Predicted Traffic Noise Levels and Impact Analysis

Using FHWA's TNM, traffic noise levels were predicted for the representative noise sensitive sites identified in **Table 3.3.1** for the existing conditions and the design year (2040) No-Build and Build Alternatives. To facilitate the impact analysis, the predicted noise levels were summarized by noise sensitive sites/areas in **Table 3.3.1** located at the end of Section 3.3. The following summarizes the predicted noise levels and impacts by noise sensitive areas. Predicted design year 2040 noise levels for the Build Alternative were compared to the NAC and to existing conditions predicted levels to assess potential noise impacts associated with the proposed project (see **Table 3.3.1**). As presented below, although a number of sites approach or exceed the NAC, the proposed improvements do not result in any substantial noise increases (i.e., greater than 15 dB(A) over existing levels).

#### 3.3.1 South of SR 80/Southern Boulevard and East of South Congress Avenue

The noise sensitive sites along this segment of SR 80/Southern Boulevard include 16 single family residences and Flury Park associated with the Town of Glen Ridge and the Palm Beach Shambhala Meditation Center. The predicted traffic noise levels and the sites impacted by traffic noise associated with the project are summarized in **Table 3.3.1 Sheet**

1. Existing traffic noise levels at the 16 residences range from 60.4 dB(A) to 71.5 dB(A). The No-Build Alternative traffic noise levels at these residences range from 60.9 dB(A) to 72.1 dB(A), representing an average increase of 0.6 dB(A) above existing noise levels. Design Year Build Alternative noise levels at these sites ranges from 59.6 dB(A) to 71.5 dB(A). With the Build Alternative, the traffic noise levels are predicted to increase by no more than 0.8 dB(A) above existing noise levels. This increase in traffic noise levels are associated with future increases in traffic volumes along SR 80. Some of residences will experience a decrease in traffic noise levels up to 1.4 dB(A) since the projects shifts the SR 80/Southern Boulevard westbound travel lanes to the north away from these residences to accommodate the two proposed flyovers. Three of the single family residences represented by Receptor Sites GR1, GR3, and GR6 are predicted to experience design year noise levels that exceed the NAC of 66 dB(A) for Activity Category B, therefore these sites will be impacted by the project and will require the consideration of noise abatement measures.

At Flury Park, the playground is predicted to experience design year noise levels that exceed the NAC of 66 dB(A) for Activity Category C, therefore this site will be impacted by the project and will require the consideration of noise abatement measures.

At the Shambhala Meditation Center, the predicted interior design year noise levels were below 51.0 dB(A) (i.e., the NAC for Category D) so this site will not be impacted by the project.

### 3.3.2 South of SR 80/Southern Boulevard and East of Gem Lake Drive

The noise sensitive sites along this segment of SR 80 include 31 single and multi-family residences associated with the Town of Cloud Lake. The predicted traffic noise levels and the sites impacted by traffic noise associated with the project are summarized in **Table 3.3.1 Sheet 1**. Existing traffic noise levels at the 31 residences range from 60.7 dB(A) to 64.8 dB(A). The No-Build Alternative traffic noise levels at these residences range from 61.1 dB(A) to 65.3 dB(A), representing an average increase of 0.4 dB(A) above existing noise levels. This increase in traffic noise levels are associated with future increases in traffic volumes along SR 80. Design Year Build Alternative noise levels at these sites ranges from 59.6 dB(A) to 63.9 dB(A). With the Build Alternative, the traffic noise levels are predicted to increase by no more than 0.5 dB(A) above existing noise levels. Some of the residences

will experience a decrease in traffic noise levels up to 1.1 dB(A) since the project shifts the SR 80/Southern Boulevard westbound travel lanes to the north away from these residences to accommodate the two proposed flyovers. In addition, the mechanically stabilized earth (MSE) walls associated with the two flyovers are anticipated to block some of traffic noise from westbound SR 80 (see **Figure 1.5.3**). Since the design year noise levels are below 66.0 dB(A) (i.e., the NAC for Category B), none of these residences, represented by Receptor Sites CL1 through CL28, will be impacted by the project.

### 3.3.3 West of I-95 and North of Summit Boulevard

The noise sensitive sites along this segment of I-95 include 11 single family residences associated with the Town of Glen Ridge, Cloud Lake Conservation Area, and Renaissance Charter School. The predicted traffic noise levels and the sites impacted by traffic noise associated with the project are summarized in **Table 3.3.1 Sheets 1 and 2**. Existing traffic noise levels at the 11 residences range from 60.3 dB(A) to 68.8 dB(A). The No-Build Alternative traffic noise levels at these residences also range from 60.3 dB(A) to 68.8 dB(A). The predicted noise levels for existing conditions and the No-Build Alternative are similar because both were based on LOS C traffic volumes along I-95. Design Year Build Alternative noise levels at these sites ranges from 59.4 dB(A) to 67.8 dB(A). With the Build Alternative, the traffic noise levels are not predicted to increase. These residences will experience an average decrease in traffic noise levels of 0.8 dB(A) due to the proposed concrete barrier wall that will block some of the tire noise from I-95. A 32-inch tall concrete barrier wall is proposed to be constructed along the outside shoulder of the I-95 southbound lanes between Stations 1294+00 and 1316+00. Three single family residences, represented by Receptor Sites GR19, GR22, and GR25, and the sports field and playground area associated with Renaissance Charter School, represented by Receptor Sites RC1 and RC2, are predicted to experience design year noise levels that exceed the NAC of 66 dB(A) for Activity Categories B and C, therefore these sites will be impacted by the project. At the Cloud Lake Conservation Area, all of the predicted design year noise levels were below 66.0 dB(A) (i.e., the NAC for Category B) so this site will not be impacted by the project.

### 3.3.4 East of I-95 and South of SR 80/Southern Boulevard

The noise sensitive sites along this segment of I-95 and/or SR 80/Southern Boulevard include the Palm Beach Zoo, Dreher Park North, South Florida Science Center and Aquarium, Holy Cross Church/School, and Ridgeland Park Subdivision. The predicted traffic noise levels and the sites impacted by traffic noise associated with the project are summarized in **Table 3.3.1 Sheets 2 and 3**. The traffic noise levels in the vicinity of the Palm Beach Zoo are minimized by an existing 8-foot-tall shoulder mounted noise barrier extending from Station 1291+00 to 1297+00 and a 18-foot-tall ground mounted noise barrier extending from Station 1295+00 to 1305+00 (see **Figure 3.3.1**). In addition, the posted speed of 35 mph for SR 80 east of I-95 also minimizes traffic noise levels in this area.

At the Palm Beach Zoo, existing traffic noise levels range from 63.8 dB(A) to 67.2 dB(A). The No-Build Alternative traffic noise levels at this site also range from 63.8 dB(A) to 67.2 dB(A). The predicted noise levels for the Existing Conditions and No-Build Alternative are similar because both were based on LOS C traffic volumes along I-95. Design Year Build Alternative noise levels at these sites ranges from 63.2 dB(A) to 65.6 dB(A). With the Build Alternative, the traffic noise levels are not predicted to increase. These sites will experience a decrease in traffic noise levels up to 1.8 dB(A) due to the proposed concrete barrier wall that will block some of the tire noise from I-95. A 32-inch-tall concrete barrier wall is proposed to be constructed along the outside shoulder of the I-95 northbound lanes between Stations 1303+00 and 1324+00. All of the predicted design year noise levels for the Palm Beach Zoo were below 66.0 dB(A) (i.e., the NAC for Category C) so this site will not be impacted by the project.

At Dreher Park North, the existing traffic noise levels range from 59.0 dB(A) to 77.6 dB(A). The No-Build Alternative traffic noise levels at site range from 59.2 dB(A) to 77.6 dB(A). The predicted noise levels existing and No-Build Alternative are similar because both were based on LOS C traffic volumes along I-95. Design Year Build Alternative noise levels at these sites ranges from 58.5 dB(A) to 72.1 dB(A). With the Build Alternative, the traffic noise levels are not predicted to increase. This recreational area will experience a decrease in traffic noise levels up to 7.9 dB(A) due to the proposed concrete barrier wall that will block some of the tire noise from I-95. A 32-inch-tall concrete barrier wall is proposed to be



constructed along the outside shoulder of the I-95 northbound lanes between Stations 1303+00 and 1324+00. The trails and picnic pavilions associated with Dreher Park North, represented by Receptor Sites DP10 through DP12, DP15 through DP17, DP21, and DP22, are predicted to experience design year noise levels that exceed the NAC of 66 dB(A) for Activity Category C, therefore areas of Dreher Park North will be impacted by the project.

At the Holy Cross Church/School along SR 80/Southern Boulevard and the single family residences in the Ridgeland Park Subdivision along Parker Avenue, the predicted design year noise levels were below 66.0 dB(A) (i.e., the NAC for Categories B and C) so these sites will not be impacted by the project.

At the South Florida Science Center and Aquarium, the predicted interior design year noise levels were below 51.0 dB(A) (i.e., the NAC for Category D) so this site will not be impacted by the project.

### 3.3.5 North of SR 80/Southern Boulevard and East/West of I-95

The noise sensitive sites along this segment of I-95 and/or SR 80/Southern Boulevard include the residences within the Hillcrest Subdivision and Vedado Subdivision, the recreational areas associated with the Palm Beach Atlantic University Athletic Campus and the Hilton Palm Beach Airport Hotel, the interior area of the Universal Church, and the exterior seating area associated with the Capri Restaurant. The predicted traffic noise levels and the sites impacted by traffic noise associated with the project are summarized in **Table 3.3.1 Sheets 2, 3, and 4**. The traffic noise levels in the vicinity of the SR 80/Southern Boulevard and the I-95 northbound on ramp are minimized by an existing 8-foot-tall shoulder mounted noise barrier. The noise barrier extends along SR 80/Southern Boulevard and along the I-95 on ramp (see **Figure 3.3.1 Sheet 5 of 6**). In addition, the posted speed of 35 mph for SR 80 east of I-95 and the existing 32-inch-tall concrete barrier wall and the slightly taller opaque visual barrier along the I-95 northbound on ramp also minimizes traffic noise levels in this area.

For the residences in the Hillcrest Subdivision, existing traffic noise levels at the 24 representative sites evaluated range from 58.9 dB(A) to 64.1 dB(A). The No-Build Alternative traffic noise levels at these residences range from 59.3 dB(A) to 64.6 dB(A),





representing an average increase of 0.5 dB(A) above existing noise levels. This increase in traffic noise levels is associated with future increases in traffic volumes along SR 80/Southern Boulevard and I-95. Design Year Build Alternative noise levels at these sites range from 58.9 dB(A) to 64.4 dB(A). With the Build Alternative, the traffic noise levels are predicted to increase by no more than 0.6 dB(A) above existing noise levels. This increase in traffic noise levels is also associated with future increases in traffic volumes along SR 80. Some of the residences will experience a decrease in traffic noise levels up to 0.6 dB(A) since the project shifts some of the traffic currently using the I-95 northbound on-ramp to the proposed eastbound to northbound flyover ramp, which is located further to the west of this residential community. Since the design year noise levels are below 66.0 dB(A) (i.e., the NAC for Category B), none of these residences in the Hillcrest Subdivision, represented by Receptor Sites HC1 through HC24, will be impacted by the project.

For the residences in the Vedado Subdivision, existing traffic noise levels at the 29 representative sites evaluated range from 56.8 dB(A) to 65.7 dB(A). The No-Build Alternative traffic noise levels at these residences range from 57.0 dB(A) to 65.8 dB(A), representing an average increase of 0.1 dB(A) above existing noise levels. This increase in traffic noise levels are associated with future increases in traffic volumes along SR 80/Southern Boulevard. Design Year Build Alternative noise levels at these sites range from 56.5 dB(A) to 65.6 dB(A). With the Build Alternative, the traffic noise levels are predicted to increase by no more than 1.0 dB(A) above existing noise levels. This increase in traffic noise levels is also associated with future increases in traffic volumes along SR 80/Southern Boulevard and the proposed westerly extension of the eastbound left turn lanes to Parker Avenue (see **Concept Plans in Appendix A**). Some residences will experience a decrease in traffic noise levels up to 0.5 dB(A) since the projects shifts some of the traffic currently using the I-95 northbound on ramp to the proposed eastbound to northbound flyover ramp which is located further to the west of this residential community. Since the design year noise levels are below 66.0 dB(A) (i.e., the NAC for Category B), none of these residences in the Vedado Subdivision, represented by Receptor Sites V1 through V29, will be impacted by the project.





At Palm Beach Atlantic University Athletic Campus recreational trails, existing traffic noise levels range from 60.7 dB(A) to 64.7 dB(A). The No-Build Alternative traffic noise levels range from 61.1 dB(A) to 64.8 dB(A), representing an average increase of 0.3 dB(A) above existing noise levels. This increase in traffic noise levels is associated with future increases in traffic volumes along I-95 northbound on ramp from SR 80/Southern Boulevard. Design Year Build Alternative noise levels at these sites range from 60.4 dB(A) to 62.1 dB(A). With the Build Alternative, the traffic noise levels are not predicted to increase. This area will experience a decrease in traffic noise levels up to 2.6 dB(A) because the project shifts some of the traffic currently using the I-95 northbound on ramp to the proposed eastbound to northbound flyover ramp which is located further to the west of this recreational area. Since all of the predicted design year noise levels for the Palm Beach Atlantic University Athletic Campus were below 66.0 dB(A) (i.e., the NAC for Category C), this recreational site will not be impacted by the project.

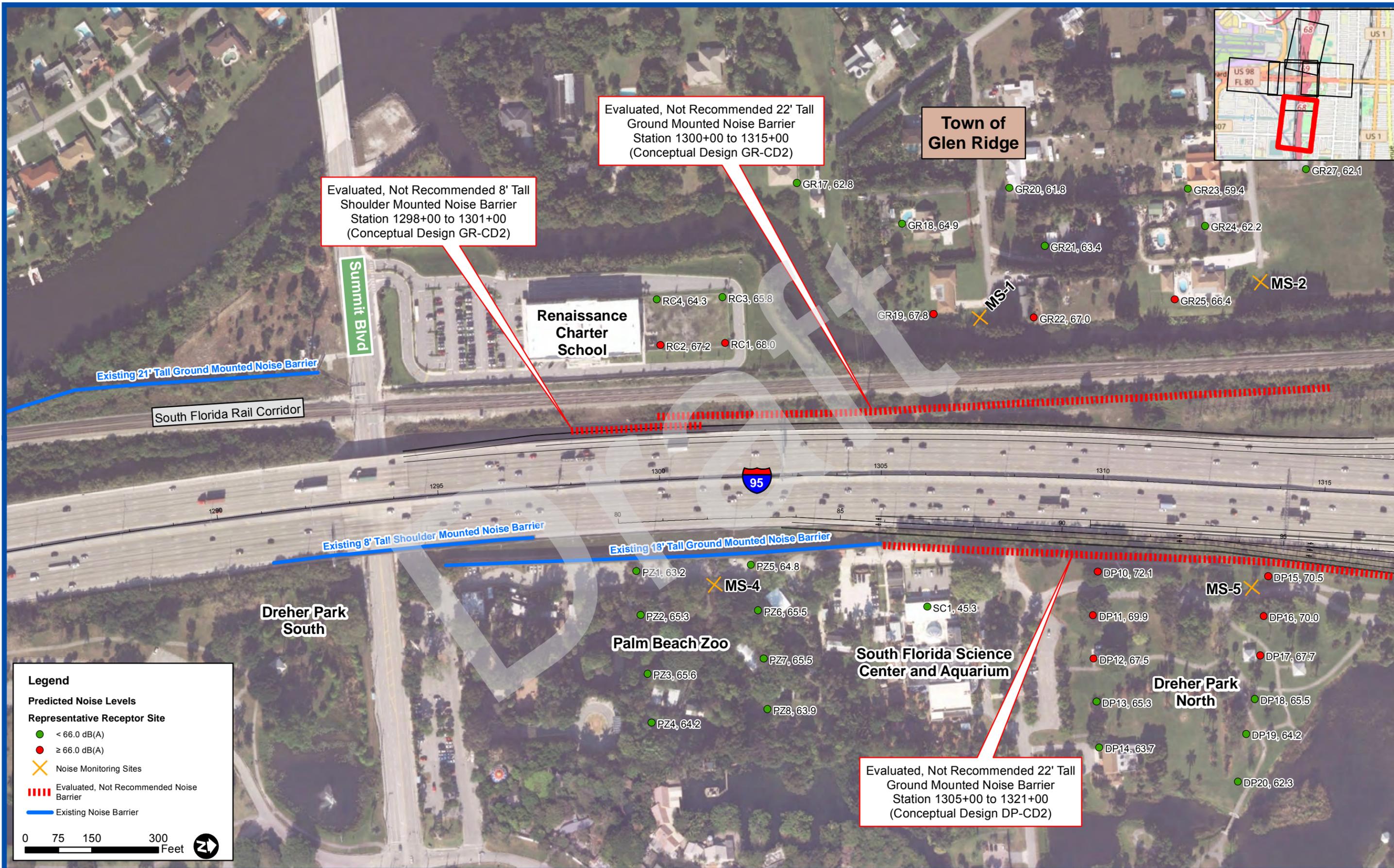
At the Hilton Palm Beach Airport Hotel recreational areas and the outdoor seating of the Capri Restaurant, the predicted design year noise levels were below 71.0 dB(A) (i.e., the NAC for Category E) so these sites will not be impacted by the project.

At the Universal Church, the predicted interior design year noise levels were below 51.0 dB(A) (i.e., the NAC for Category D) so this site will not be impacted by the project.

### 3.3.6 Summary of Noise Impacts

As described in Sections 3.3.1 through 3.3.5, predicted design year traffic noise levels for the Build Alternative will approach or exceed the NAC at six residences within the Town of Glen Ridge and at three special land uses (i.e., recreational areas associated with Flury Park, Dreher Park North, and Renaissance Charter School). Therefore, the feasibility and reasonableness of noise barriers will be evaluated for these impacted noise sensitive sites/areas. Predicted noise levels for the other noise sensitive sites/areas were below the NAC and do not require the consideration of noise abatement measures.







Evaluated, Not Recommended  
 22' Tall Ground Mounted Noise Barrier Station  
 1305+00 to 1321+00  
 (Conceptual Design DP-CD2)

**Legend**

**Predicted Noise Levels**

**Representative Receptor Site**

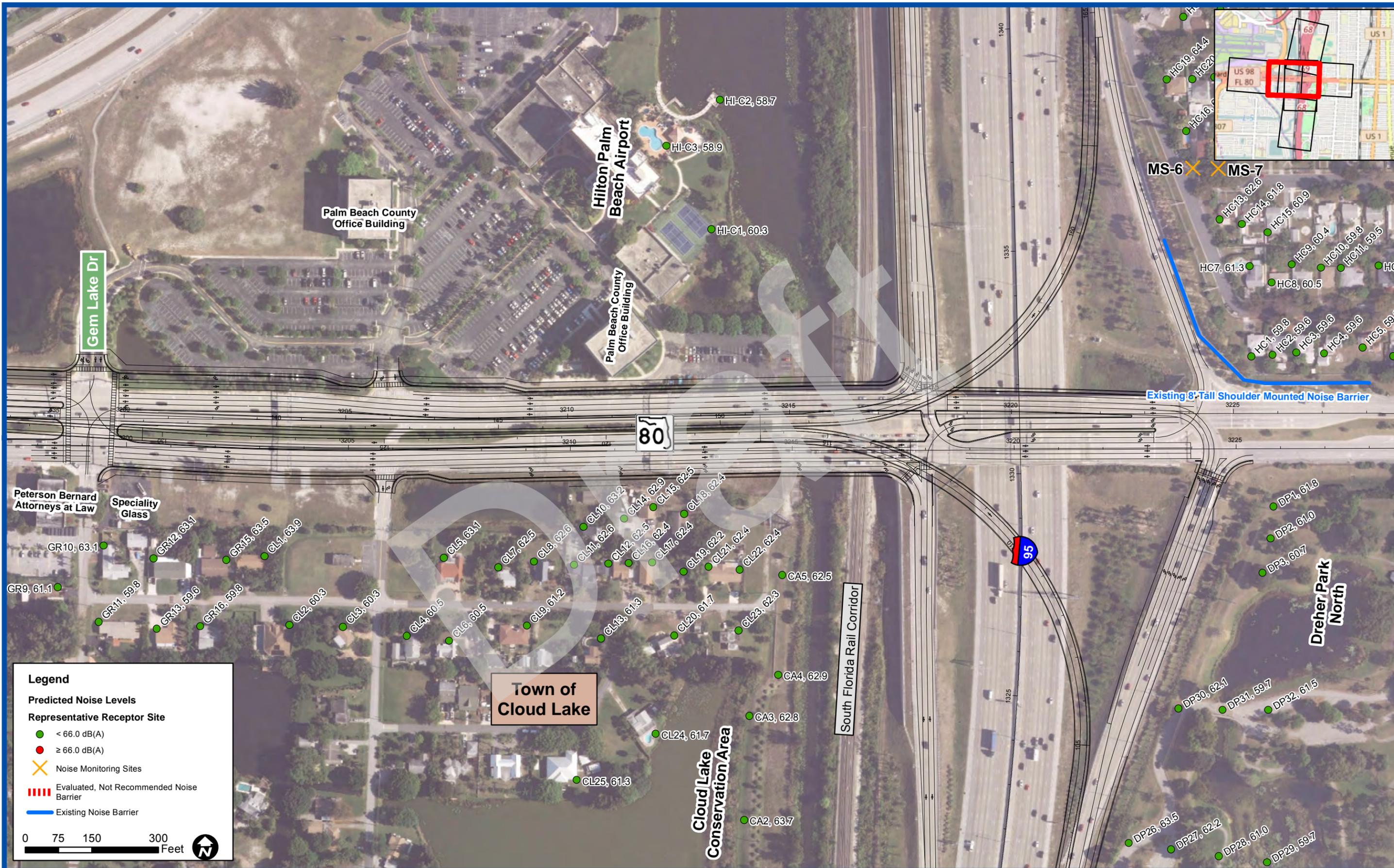
- < 66.0 dB(A)
- ≥ 66.0 dB(A)
- ✕ Noise Monitoring Sites
- ▬ Evaluated, Not Recommended Noise Barrier
- ▬ Existing Noise Barrier

0 75 150 300 Feet









**Legend**

**Predicted Noise Levels**

**Representative Receptor Site**

- < 66.0 dB(A)
- ≥ 66.0 dB(A)
- ✕ Noise Monitoring Sites
- ▬ Evaluated, Not Recommended Noise Barrier
- Existing Noise Barrier

0 75 150 300 Feet





Table 3.3.1: Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 1 of 4)

Representative Noise Receptor Site Designation	Name of Noise Sensitive Site/Area [Noise Abatement Activity Category - FDOT's Noise Abatement Approach Criteria dB(A)]	Number of Noise Sensitive Sites Represented (Description)	Station Number	Distance from the Center of Nearest Existing Travel Lane/Proposed Travel Lane (Feet)	TNM Predicted Noise Levels (dBA)			Difference Between Existing Conditions and No-Build Alternative	Difference Between Existing Conditions and Build Alternative
					Existing Conditions	Design Year (2040)			
						No-Build Alternative	Build Alternative		
South of SR 80/Southern Boulevard and between South Congress Avenue and East of Gem Lake Drive (see Figure 3.3.1 Sheets 4 and 5)									
GR1	Glen Ridge Along SR 80 [NAC B Exterior - 66 dB(A)]	1 (First Row Residence)	3180+90	110/110 (SR 80)	68.1	68.9	68.9	0.8	0.8
GR2		1 (First Row Residence)	3183+90	205/205 (SR 80)	64.0	64.7	64.7	0.7	0.7
GR3		1 (First Row Residence)	3190+00	61/61 (SR 80)	71.5	72.1	71.5	0.6	0.0
GR4		1 (Second Row Residence)	3189+70	182/182 (SR 80)	61.9	62.5	62.0	0.6	0.1
GR5		1 (First Row Residence)	3191+40	235/235 (SR 80)	62.5	63.1	62.7	0.6	0.2
GR6		1 (First Row Residence)	3193+80	163/163 (SR 80)	66.7	67.2	66.3	0.5	-0.4
GR7		1 (Second Row Residence)	3193+90	292/292 (SR 80)	62.0	62.6	62.3	0.6	0.3
GR8		1 (First Row Residence)	3195+40	328/328 (SR 80)	61.0	61.5	61.2	0.5	0.2
GR9		1 (First Row Residence)	3198+50	287/287 (SR 80)	61.8	62.3	61.1	0.5	-0.7
GR10		1 (First Row Residence)	3199+50	193/139 (SR 80)	64.5	65.0	63.1	0.5	-1.4
GR11		1 (Second Row Residence)	3199+50	368/309 (SR 80)	60.4	60.9	59.8	0.5	-0.6
GR12		1 (First Row Residence)	3200+50	222/182 (SR 80)	64.2	64.7	63.1	0.5	-1.1
GR13		1 (Second Row Residence)	3200+50	382/339 (SR 80)	60.4	60.9	59.6	0.5	-0.8
GR15		1 (First Row Residence)	3202+30	225/176 (SR 80)	64.2	64.7	63.5	0.5	-0.7
GR16		1 (Second Row Residence)	3201+60	374/328 (SR 80)	60.5	61.0	59.8	0.5	-0.7
Minimum					60.4	60.9	59.6	0.5	-1.4
Maximum					71.5	72.1	71.5	0.8	0.8
Average					63.6	64.1	63.3	0.6	-0.3
Total Number of Sites Equal to or Greater than 66.0 dB(A)					3	3	3	---	---
SM1	Palm Beach Shambhala Meditation Center [NAC D Interior - 51 dB(A)]	1 (Public Meeting Room)	3188+50	85/85 (SR 80)	44.6	45.2	44.9	0.8	0.3
FP1	Flury Park [NAC C Exterior - 66 dB(A)]	1 (Recreational - Playground)	3187+30	50/50 (SR 80)	72.0	72.5	72.5	0.8	0.5
South of SR 80/Southern Boulevard, West of I-95, and East of Gem Lake Drive (see Figure 3.3.1 Sheets 1, 2, and 5)									
CL1	Cloud Lake [NAC B Exterior - 66 dB(A)]	1 (First Row Residence)	3203+10	215/198 (SR 80)	64.8	65.3	63.9	0.5	-0.9
CL2		1 (First Row Residence)	3203+50	369/350 (SR 80)	60.9	61.3	60.3	0.4	-0.6
CL3		1 (First Row Residence)	3204+60	372/355 (SR 80)	60.8	61.3	60.3	0.5	-0.5
CL4		1 (First Row Residence)	3206+30	390/376 (SR 80)	60.8	61.3	60.5	0.5	-0.3
CL5		1 (First Row Residence)	3207+20	212/200 (SR 80)	64.1	64.6	63.1	0.5	-1.0
CL6		1 (Second Row Residence)	3207+20	400/385 (SR 80)	60.7	61.1	60.5	0.4	-0.2
CL7		1 (First Row Residence)	3208+40	233/205 (SR 80)	63.2	63.6	62.5	0.4	-0.7
CL8		1 (First Row Residence)	3209+10	221/195 (SR 80)	63.1	63.5	62.6	0.4	-0.5
CL9		1 (Second Row Residence)	3209+00	365/338 (SR 80)	61.3	61.7	61.2	0.4	-0.1
CL10		1 (First Row Residence)	3210+30	141/120 (SR 80)	63.5	64.0	63.2	0.5	-0.3
CL11		2 (First Row Multi-Family Residence)	3210+00	226/205 (SR 80)	62.8	63.3	62.6	0.5	-0.2
CL12		2 (Second Row Multi-Family Residence)	3210+80	225/202 (SR 80)	62.6	63.1	62.5	0.5	-0.1
CL13		2 (Second Row Multi-Family Residence)	3210+60	393/370 (SR 80)	61.0	61.4	61.3	0.4	0.3
CL14		1 (First Row Residence)	3211+20	123/104 (SR 80)	63.0	63.5	62.9	0.5	-0.1
CL15		1 (First Row Residence)	3211+90	97/78 (SR 80)	62.3	62.8	62.5	0.5	0.2
CL16		1 (Second Row Residence)	3211+30	223/203 (SR 80)	62.4	62.9	62.4	0.5	0.0
CL17		1 (Second Row Residence)	3211+80	223/203 (SR 80)	62.2	62.7	62.4	0.5	0.2
CL18		1 (First Row Residence)	3212+50	115/96 (SR 80)	62.0	62.5	62.4	0.5	0.4
CL19		1 (Second Row Residence)	3212+50	243/226 (SR 80)	61.8	62.2	62.2	0.4	0.4
CL20		1 (Third Row Residence)	3212+10	387/368 (SR 80)	61.3	61.7	61.7	0.4	0.4
CL21		1 (First Row Residence)	3213+00	231/216 (SR 80)	62.0	62.5	62.4	0.5	0.4
CL22		1 (First Row Residence)	3213+90	237/225 (SR 80)	61.9	62.4	62.4	0.5	0.5
CL23		1 (Second Row Residence)	3213+90	377/360 (SR 80)	62.0	62.5	62.3	0.5	0.3
CL24		1 (First Row Residence)	1324+00	596/596 (I-95 SB on Ramp)	61.3	61.6	61.7	0.3	0.4
CL25		1 (Third Row Residence)	3209+90	780/780 (I-95 SB on Ramp)	61.0	61.3	61.3	0.3	0.3
CL26		1 (First Row Residence)	1320+10	671/671 (I-95 SB on Ramp)	63.2	63.5	62.6	0.3	-0.6
CL27		1 (First Row Residence)	1318+60	550/550 (I-95 SB on Ramp)	64.4	64.6	63.8	0.2	-0.6
CL28		1 (First Row Residence)	1318+30	683/683 (I-95 SB on Ramp)	60.7	61.1	59.6	0.4	-1.1
Minimum					60.7	61.1	59.6	0.2	-1.1
Maximum					64.8	65.3	63.9	0.5	0.5
Average					62.2	62.6	62.0	0.4	-0.1
Total Number of Sites Equal to or Greater than 66.0 dB(A)					0	0	0	---	---
West of I-95 and North of Summit Boulevard (see Figure 3.3.1 Sheets 1 and 2)									
GR17	Glen Ridge Along I-95 Southbound [NAC B Exterior - 66 dB(A)]	1 (First Row Residence)	1303+90	573/558 (I-95 SB)	63.0	63.0	62.8	0.0	-0.2
GR18		1 (First Row Residence)	1306+10	480/466 (I-95 SB)	65.5	65.6	64.9	0.1	-0.6
GR19		1 (Second Row Residence)	1306+80	277/263 (I-95 SB)	68.8	68.8	67.8	0.0	-1.0
GR20		1 (Third Row Residence)	1308+80	567/554 (I-95 SB)	62.6	62.7	61.8	0.1	-0.8
GR21		1 (Second Row Residence)	1309+10	437/424 (I-95 SB)	64.1	64.2	63.4	0.1	-0.7
GR22		1 (First Row Residence)	1308+90	273/260 (I-95 SB)	67.9	68.0	67.0	0.1	-0.9
GR23		1 (Third Row Residence)	1312+50	581/563 (I-95 SB)	60.3	60.3	59.4	0.0	-0.9
GR24		1 (Second Row Residence)	1313+00	501/483 (I-95 SB)	62.8	62.9	62.2	0.1	-0.6
GR25		1 (First Row Residence)	1312+50	330/312 (I-95 SB)	68.0	68.1	66.4	0.1	-1.6
GR26		1 (Second Row Residence)	1315+90	770/764 (I-95 SB on Ramp)	61.0	61.1	60.6	0.1	-0.4
GR27		1 (First Row Residence)	1315+50	626/620 (I-95 SB on Ramp)	62.9	63.0	62.1	0.1	-0.8

Table 3.3.1: Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 2 of 4)

Representative Noise Receptor Site Designation	Name of Noise Sensitive Site/Area [Noise Abatement Activity Category - FDOT's Noise Abatement Approach Criteria dB(A)]	Number of Noise Sensitive Sites Represented (Description)	Station Number	Distance from the Center of Nearest Existing Travel Lane/Proposed Travel Lane (Feet)	TNM Predicted Noise Levels (dBA)			Difference Between Existing Conditions and No-Build Alternative	Difference Between Existing Conditions and Build Alternative
					Existing Conditions	Design Year (2040)			
						No-Build Alternative	Build Alternative		
West of I-95 and North of Summit Boulevard (see Figure 3.3.1 Sheets 1 and 2)									
Minimum					60.3	60.3	59.4	0.0	-1.6
Maximum					68.8	68.8	67.8	0.1	-0.2
Average					64.3	64.3	63.5	0.1	-0.8
Total Number of Sites Equal to or Greater than 66.0 dB(A)					3	3	3	---	---
CA1	Cloud Lake Conservation Area [NAC C Exterior - 66 dB(A)]	1 (Recreational - Trail)	1319+50	415/415 (I-95 SB on Ramp)	65.7	65.9	65.5	0.2	-0.2
CA2		1 (Recreational - Trail)	1321+80	410/410 (I-95 SB on Ramp)	63.6	63.9	63.7	0.3	0.1
CA3		1 (Recreational - Trail)	1324+25	385/385 (I-95 SB on Ramp)	62.2	62.6	62.8	0.4	0.6
CA4		1 (Recreational - Trail)	1325+20	315/315 (I-95 SB on Ramp)	62.7	63.1	62.9	0.4	0.2
CA5		1 (Recreational - Trail)	1328+00	305/305 (I-95 SB on Ramp)	61.7	62.2	62.5	0.5	0.8
Minimum					61.7	62.2	62.5	0.2	-0.2
Maximum					65.7	65.9	65.5	0.5	0.8
Average					63.2	63.5	63.5	0.4	0.3
Total Number of Sites Equal to or Greater than 66.0 dB(A)					0	0	0	---	---
RC1	Renaissance Charter School [NAC C Exterior - 66 dB(A)]	1 (Recreational - Sports Field and Playground)	1301+90	218/204 (I-95 SB)	68.8	68.9	68.0	0.1	-0.8
RC2		1 (Recreational - Sports Field and Playground)	1300+20	218/204 (I-95 SB)	67.8	67.8	67.2	0.0	-0.6
RC3		1 (Recreational - Sports Field and Playground)	1302+00	330/317 (I-95 SB)	66.4	66.4	65.8	0.0	-0.6
RC4		1 (Recreational - Sports Field and Playground)	1300+20	335/323 (I-95 SB)	64.8	64.9	64.3	0.1	-0.5
Minimum					64.8	64.9	64.3	0.0	-0.8
Maximum					68.8	68.9	68.0	0.1	-0.5
Average					67.0	67.0	66.3	0.1	-0.6
Total Number of Sites Equal to or Greater than 66.0 dB(A)					3	3	2	---	---
North of SR 80/Southern Boulevard, West of I-95, and East of Gem Lake Drive (see Figure 3.3.1 Sheet 2)									
HI-C1	Hilton Palm Beach Airport Hotel [NAC E Exterior - 71 dB(A)]	1 (Recreational - Tennis Courts)	1335+50	460/422 (I-95 SB off Ramp)	59.8	60.4	60.3	0.6	0.5
HI-C2		1 (Recreational - Dock)	1338+50	434/397 (I-95 SB off Ramp)	58.0	58.5	58.7	0.5	0.7
HI-C3		1 (Recreational - Pool Area)	1337+70	556/520 (I-95 SB off Ramp)	58.7	59.2	58.9	0.5	0.2
Minimum					58.0	58.5	58.7	0.5	0.2
Maximum					59.8	60.4	60.3	0.6	0.7
Average					58.8	59.4	59.3	0.5	0.5
Total Number of Sites Equal to or Greater than 71.0 dB(A)					0	0	0	---	---
North of Summit Boulevard and East of I-95 (see Figure 3.3.1 Sheets 1)									
PZ1	Palm Beach Zoo [NAC C Exterior - 66 dB(A)]	1 (Recreational)	1299+50	96/96 (I-95 NB)	63.8	63.8	63.2	0.0	-0.6
PZ2		1 (Recreational)	1299+50	195/195 (I-95 NB)	66.0	66.1	65.3	0.1	-0.7
PZ3		1 (Recreational)	1299+50	327/327 (I-95 NB)	66.3	66.3	65.6	0.0	-0.7
PZ4		1 (Recreational)	1299+50	439/439 (I-95 NB)	65.0	65.0	64.2	0.0	-0.8
PZ5		1 (Recreational)	1302+00	101/101 (I-95 NB)	65.8	65.8	64.8	0.0	-1.0
PZ6		1 (Recreational)	1302+00	203/203 (I-95 NB)	67.2	67.2	65.5	0.0	-1.7
PZ7		1 (Recreational)	1302+00	313/313 (I-95 NB)	67.1	67.1	65.5	0.0	-1.6
PZ8		1 (Recreational)	1302+00	426/426 (I-95 NB)	65.7	65.7	63.9	0.0	-1.8
Minimum					63.8	63.8	63.2	0.0	-1.8
Maximum					67.2	67.2	65.6	0.1	-0.6
Average					65.9	65.9	64.8	0.0	-1.1
Total Number of Sites Equal to or Greater than 66.0 dB(A)					4	4	0	---	---
SC1	South Florida Science Center and Aquarium [NAC D Interior - 51 dB(A)]	1 (Institutional Structure)	1306+00	202/175 (I-95 NB)	48.5	48.6	45.3	0.1	-3.2
South of SR 80/Southern Boulevard and East of I-95 (Figure 3.3.1 Sheets 1, 2, 5, and 6)									
DP1	Dreher Park North [NAC C Exterior - 66 dB(A)]	1 (Recreational - Trails and Picnic Pavilions)	3225+80	115/115 (SR 80)	63.4	63.8	61.8	0.4	-1.6
DP2		1 (Recreational - Trails and Picnic Pavilions)	1328+40	154/154 (I-95 NB Off Ramp)	63.0	63.4	61.0	0.4	-2.0
DP3		1 (Recreational - Trails and Picnic Pavilions)	1327+60	162/162 (I-95 NB Off Ramp)	62.9	63.3	60.7	0.4	-2.2
DP4		1 (Recreational - Trails and Picnic Pavilions)	3229+90	105/105 (SR 80)	63.3	63.4	62.2	0.1	-1.1
DP5		1 (Recreational - Trails and Picnic Pavilions)	3229+90	162/162 (SR 80)	62.7	62.9	61.2	0.2	-1.5
DP6		1 (Recreational - Trails and Picnic Pavilions)	3229+90	219/219 (SR 80)	61.8	62.0	60.0	0.2	-1.8
DP7		1 (Recreational - Trails and Picnic Pavilions)	3233+50	101/101 (SR 80)	62.4	62.5	62.0	0.1	-0.4
DP8		1 (Recreational - Trails and Picnic Pavilions)	3233+50	178/178 (SR 80)	60.1	60.2	59.6	0.1	-0.5
DP9		1 (Recreational - Trails and Picnic Pavilions)	3233+50	238/238 (SR 80)	59.0	59.2	58.5	0.2	-0.5
DP10		1 (Recreational - Trails and Picnic Pavilions)	1310+00	110/79 (I-95 NB)	77.6	77.6	72.1	0.0	-5.5
DP11		1 (Recreational - Trails and Picnic Pavilions)	1310+00	207/178 (I-95 NB)	74.0	74.1	69.9	0.1	-4.1
DP12		1 (Recreational - Trails and Picnic Pavilions)	1310+00	306/275 (I-95 NB)	71.4	71.4	67.5	0.0	-3.9
DP13		1 (Recreational - Trails and Picnic Pavilions)	1310+10	402/371 (I-95 NB)	69.1	69.2	65.3	0.1	-3.8
DP14		1 (Recreational - Trails and Picnic Pavilions)	1310+10	504/473 (I-95 NB)	67.1	67.2	63.7	0.1	-3.4
DP15		1 (Recreational - Trails and Picnic Pavilions)	1313+90	98/58 (I-95 NB)	77.5	77.6	70.5	0.1	-7.0
DP16		1 (Recreational - Trails and Picnic Pavilions)	1313+90	188/150 (I-95 NB)	74.6	74.7	70.0	0.1	-4.6

Table 3.3.1: Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 3 of 4)

Representative Noise Receptor Site Designation	Name of Noise Sensitive Site/Area [Noise Abatement Activity Category - FDOT's Noise Abatement Approach Criteria dB(A)]	Number of Noise Sensitive Sites Represented (Description)	Station Number	Distance from the Center of Nearest Existing Travel Lane/Proposed Travel Lane (Feet)	TNM Predicted Noise Levels (dBA)			Difference Between Existing Conditions and No-Build Alternative	Difference Between Existing Conditions and Build Alternative
					Existing Conditions	Design Year (2040)			
						No-Build Alternative	Build Alternative		
South of SR 80/Southern Boulevard and East of I-95 (Continued - see Figure 3.3.1 Sheets 1, 2, 5, and 6)									
DP17	Dreher Park North [NAC C Exterior - 66 dB(A)]	1 (Recreational - Trails and Picnic Pavilions)	1313+80	277/237 (I-95 NB)	72.1	72.2	67.7	0.1	-4.4
DP18		1 (Recreational - Trails and Picnic Pavilions)	1313+80	375/336 (I-95 NB)	69.8	69.9	65.5	0.1	-4.3
DP19		1 (Recreational - Trails and Picnic Pavilions)	1313+60	455/415 (I-95 NB)	68.2	68.2	64.2	0.0	-4.0
DP20		1 (Recreational - Trails and Picnic Pavilions)	1313+50	562/526 (I-95 NB)	66.2	66.3	62.3	0.1	-3.9
DP21		1 (Recreational - Trails and Picnic Pavilions)	1317+50	112/71 (I-95 NB Off Ramp)	74.2	74.5	66.3	0.3	-7.9
DP22		1 (Recreational - Trails and Picnic Pavilions)	1317+70	204/164 (I-95 NB Off Ramp)	72.5	72.7	66.3	0.2	-6.2
DP23		1 (Recreational - Trails and Picnic Pavilions)	1317+90	303/264 (I-95 NB Off Ramp)	70.4	70.5	64.4	0.1	-6.0
DP24		1 (Recreational - Trails and Picnic Pavilions)	1318+00	415/376 (I-95 NB Off Ramp)	68.0	68.2	62.7	0.2	-5.3
DP25		1 (Recreational - Trails and Picnic Pavilions)	1318+20	527/488 (I-95 NB Off Ramp)	65.9	66.0	61.4	0.1	-4.5
DP26		1 (Recreational - Trails and Picnic Pavilions)	1322+00	102/79 (I-95 NB Off Ramp)	70.8	71.3	63.5	0.5	-7.3
DP27		1 (Recreational - Trails and Picnic Pavilions)	1322+00	196/173 (I-95 NB Off Ramp)	68.9	69.2	62.2	0.3	-6.7
DP28		1 (Recreational - Trails and Picnic Pavilions)	1322+00	298/281 (I-95 NB Off Ramp)	67.1	67.3	61.0	0.2	-6.1
DP29		1 (Recreational - Trails and Picnic Pavilions)	1322+00	408/391 (I-95 NB Off Ramp)	65.2	65.4	59.7	0.2	-5.5
DP30		1 (Recreational - Trails and Picnic Pavilions)	1324+90	94/94 (I-95 NB Off Ramp)	67.8	68.4	62.1	0.6	-5.7
DP31		1 (Recreational - Trails and Picnic Pavilions)	1325+00	189/189 (I-95 NB Off Ramp)	63.5	63.8	59.7	0.3	-3.8
DP32		1 (Recreational - Trails and Picnic Pavilions)	1325+00	218/218 (I-95 NB Off Ramp)	65.6	65.9	61.5	0.3	-4.1
Minimum					59.0	59.2	58.5	0.0	-7.9
Maximum					77.6	77.6	72.1	0.6	-0.4
Average					67.1	67.2	63.2	0.2	-3.9
Total Number of Sites Equal to or Greater than 66.0 dB(A)					19	20	8	---	---
RP1	Ridgeland Park Subdivision [NAC B Exterior - 66 dB(A)]	1 (First Row Residence)	3241+90	874 (SR 80)	62.5	62.5	62.5	0.0	0.0
RP2		1 (First Row Residence)	3241+70	805 (SR 80)	61.0	61.1	61.1	0.1	0.1
RP3		1 (First Row Residence)	3242+00	637 (SR 80)	63.5	63.8	63.8	0.3	0.3
Minimum					61.0	61.1	61.1	0.0	0.0
Maximum					63.5	63.8	63.8	0.3	0.3
Average					62.3	62.5	62.5	0.1	0.1
Total Number of Sites Equal to or Greater than 66.0 dB(A)					0	0	0	---	---
HS1	Holy Cross Church/School [NAC C Exterior - 66 dB(A)]	1 (Place of Worship and School)	3237+30	45 (SR 80)	64.2	64.3	64.2	0.1	0.0
North of SR 80/Southern Boulevard and East of I-95 (see Figure 3.3.1 Sheets 5 and 6)									
HC1	Hillcrest Subdivision [NAC B Exterior - 66 dB(A)]	1 (First Row Residence)	3225+50	90 (SR 80)	60.4	60.9	59.8	0.5	-0.6
HC2		1 (First Row Residence)	3225+90	95 (SR 80)	59.9	60.4	59.6	0.5	-0.3
HC3		1 (First Row Residence)	3226+50	99 (SR 80)	60.0	60.4	59.6	0.4	-0.4
HC4		1 (First Row Residence)	3227+00	97 (SR 80)	59.9	60.3	59.6	0.4	-0.3
HC5		1 (First Row Residence)	3228+00	111 (SR 80)	60.0	60.3	59.9	0.3	-0.1
HC6		1 (First Row Residence)	3228+70	107 (SR 80)	62.6	62.7	62.2	0.1	-0.4
HC7		1 (First Row Residence)	1334+50	187 (I-95 NB on Ramp)	61.6	62.1	61.3	0.5	-0.3
HC8		1 (Second Row Residence)	1334+30	226 (I-95 NB on Ramp)	60.6	61.1	60.5	0.5	-0.1
HC9		1 (Third Row Residence)	1334+60	283 (I-95 NB on Ramp)	60.4	60.8	60.4	0.4	0.0
HC10		1 (Second Row Residence)	3227+00	293 (SR 80)	59.9	60.3	59.8	0.4	-0.1
HC11		1 (Second Row Residence)	3227+50	290 (SR 80)	59.6	60.0	59.5	0.4	-0.1
HC12		1 (Second Row Residence)	3228+50	311 (SR 80)	58.9	59.3	58.9	0.4	0.0
HC13		1 (First Row Residence)	1335+70	157 (I-95 NB on Ramp)	62.8	63.3	62.6	0.5	-0.2
HC14		1 (Second Row Residence)	1335+50	205 (I-95 NB on Ramp)	61.6	62.1	61.8	0.5	0.2
HC15		1 (Third Row Residence)	1335+30	255 (I-95 NB on Ramp)	60.7	61.2	60.9	0.5	0.2
HC16		1 (First Row Residence)	1337+60	141 (I-95 NB on Ramp)	63.8	64.3	64.1	0.5	0.3
HC17		1 (Second Row Residence)	1337+50	206 (I-95 NB on Ramp)	62.3	62.9	62.6	0.6	0.3
HC18		1 (Third Row Residence)	1337+50	267 (I-95 NB on Ramp)	61.4	61.9	61.6	0.5	0.2
HC19		1 (First Row Residence)	1338+90	123 (I-95 NB on Ramp)	64.1	64.6	64.4	0.5	0.3
HC20		1 (Second Row Residence)	1338+90	179 (I-95 NB on Ramp)	62.9	63.4	63.4	0.5	0.5
HC21		1 (Third Row Residence)	1338+90	230 (I-95 NB on Ramp)	62.3	62.8	62.9	0.5	0.6
HC22		1 (First Row Residence)	1340+50	95 (I-95 NB on Ramp)	62.6	63.2	62.9	0.6	0.3
HC23		1 (Second Row Residence)	1340+20	177 (I-95 NB on Ramp)	62.5	63.0	63.0	0.5	0.5
HC24		1 (Third Row Residence)	1340+30	263 (I-95 NB on Ramp)	61.7	62.2	62.2	0.5	0.5
Minimum					58.9	59.3	58.9	0.1	-0.6
Maximum					64.1	64.6	64.4	0.6	0.6
Average					61.4	61.8	61.4	0.5	0.0
Total Number of Sites Equal to or Greater than 66.0 dB(A)					0	0	0	---	---
North of SR 80/Southern Boulevard and East of I-95 (see Figure 3.3.1 Sheets 5 and 6)									
V1	Vedado Subdivision [NAC B Exterior - 66 dB(A)]	1 (First Row Residence)	3230+20	46/46 (SR 80)	65.7	65.8	65.6	0.1	-0.1
V2		1 (Second Row Residence)	3230+50	102/102 (SR 80)	63.0	63.1	62.7	0.1	-0.3
V3		1 (Third Row Residence)	3230+50	152/152 (SR 80)	61.3	61.5	61.0	0.2	-0.3
V4		1 (First Row Residence)	3231+30	146/146 (SR 80)	61.3	61.4	61.0	0.1	-0.3
V5		1 (First Row Residence)	3232+30	59/59 (SR 80)	64.8	64.8	64.8	0.0	0.0

Table 3.3.1: Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 4 of 4)

Representative Noise Receptor Site Designation	Name of Noise Sensitive Site/Area [Noise Abatement Activity Category - FDOT's Noise Abatement Approach Criteria dB(A)]	Number of Noise Sensitive Sites Represented (Description)	Station Number	Distance from the Center of Nearest Existing Travel Lane/Proposed Travel Lane (Feet)	TNM Predicted Noise Levels (dBA)			Difference Between Existing Conditions and No-Build Alternative	Difference Between Existing Conditions and Build Alternative	
					Existing Conditions	Design Year (2040)				
						No-Build Alternative	Build Alternative			
North of SR 80/Southern Boulevard and East of I-95 (see Figure 3.3.1 Sheets 5 and 6)										
V6	Vedado Subdivision [NAC B Exterior - 66 dB(A)]	1 (Second Row Residence)	3232+30	206/206 (SR 80)	59.5	59.7	59.3	0.2	-0.2	
V7		1 (First Row Residence)	3233+40	62/62 (SR 80)	64.3	64.4	64.4	0.1	0.1	
V8		1 (Second Row Residence)	3233+30	207/207 (SR 80)	59.3	59.4	59.0	0.1	-0.3	
V9		1 (First Row Residence)	3233+90	53/53 (SR 80)	64.5	64.6	64.7	0.1	0.2	
V10		1 (Second Row Residence)	3234+10	216/216 (SR 80)	58.7	58.9	58.4	0.2	-0.3	
V11		1 (First Row Residence)	3234+90	75/75 (SR 80)	62.8	62.9	62.9	0.1	0.1	
V12		1 (Second Row Residence)	3234+90	236/236 (SR 80)	58.2	58.3	57.7	0.1	-0.5	
V13		1 (First Row Residence)	3235+30	65/65 (SR 80)	63.0	63.1	63.1	0.1	0.1	
V14		1 (Second Row Residence)	3235+50	220/220 (SR 80)	58.2	58.4	57.9	0.2	-0.3	
V15		1 (First Row Residence)	3236+40	81/81 (SR 80)	62.2	62.3	62.2	0.1	0.0	
V16		1 (Second Row Residence)	3236+20	231/231 (SR 80)	58.3	58.5	57.9	0.2	-0.4	
V17		1 (First Row Residence)	3237+50	104/104 (SR 80)	60.6	60.7	60.8	0.1	0.2	
V18		1 (Second Row Residence)	3237+50	230/230 (SR 80)	57.9	58.0	57.4	0.1	-0.5	
V19		1 (First Row Residence)	3238+00	95/95 (SR 80)	60.8	60.9	61.0	0.1	0.2	
V20		1 (Second Row Residence)	3238+10	231/231 (SR 80)	57.4	57.6	57.1	0.2	-0.3	
V21		1 (First Row Residence)	3238+90	106/106 (SR 80)	60.2	60.3	60.5	0.1	0.3	
V22		1 (Second Row Residence)	3238+90	228/228 (SR 80)	57.2	57.4	56.9	0.2	-0.3	
V23		1 (First Row Residence)	3239+80	112/112 (SR 80)	60.1	60.2	60.2	0.1	0.1	
V24		1 (Second Row Residence)	3239+70	243/243 (SR 80)	56.8	57.0	56.5	0.2	-0.3	
V25		1 (First Row Residence)	3240+40	114/114 (SR 80)	60.4	60.6	60.5	0.2	0.1	
V26		1 (First Row Residence)	3241+20	118/118 (SR 80)	60.4	60.6	60.4	0.2	0.0	
V27		1 (Second Row Residence)	3241+00	247/247 (SR 80)	58.0	58.2	58.1	0.2	0.1	
V28		1 (First Row Residence)	3241+50	144/144 (SR 80)	60.2	60.3	60.2	0.1	0.0	
V29		1 (First Row Residence)	3242+00	142/142 (SR 80)	63.5	63.7	64.5	0.2	1.0	
Minimum					56.8	57.0	56.5	0.0	-0.5	
Maximum					65.7	65.8	65.6	0.2	1.0	
Average					60.6	60.8	60.6	0.1	-0.1	
Total Number of Sites Equal to or Greater than 66.0 dB(A)					0	0	0	---	---	
North of SR 80/Southern Boulevard and East of I-95 (see Figure 3.3.1 Sheet 3)										
PC1	Palm Beach University Athletic Campus [NAC C Exterior - 66 dB(A)]	1 (Recreational - Trails)	1341+60	69 (I-95 NB on Ramp)	62.0	62.6	61.9	0.6	-0.1	
PC2		1 (Recreational - Trails)	1341+60	173 (I-95 NB on Ramp)	62.3	62.8	62.1	0.5	-0.2	
PC3		1 (Recreational - Trails)	1341+60	273 (I-95 NB on Ramp)	61.7	62.1	61.2	0.4	-0.5	
PC4		1 (Recreational - Trails)	1341+60	367 (I-95 NB on Ramp)	60.7	61.1	60.4	0.4	-0.3	
PC5		1 (Recreational - Trails)	1342+60	71 (I-95 NB on Ramp)	61.6	62.0	61.4	0.4	-0.2	
PC6		1 (Recreational - Trails)	1342+70	170 (I-95 NB on Ramp)	63.0	63.4	61.9	0.4	-1.1	
PC7		1 (Recreational - Trails)	1342+80	271 (I-95 NB on Ramp)	62.7	63.0	61.6	0.3	-1.1	
PC8		1 (Recreational - Trails)	1342+90	375 (I-95 NB on Ramp)	61.7	62.0	60.5	0.3	-1.2	
PC9		1 (Recreational - Trails)	1343+70	75 (I-95 NB on Ramp)	64.0	64.0	61.8	0.0	-2.2	
PC10		1 (Recreational - Trails)	1343+80	167 (I-95 NB on Ramp)	64.7	64.8	62.1	0.1	-2.6	
PC11		1 (Recreational - Trails)	1343+90	279 (I-95 NB on Ramp)	63.6	63.8	61.8	0.2	-1.8	
PC12		1 (Recreational - Trails)	1344+00	383 (I-95 NB on Ramp)	62.2	62.4	60.6	0.2	-1.6	
Minimum					60.7	61.1	60.4	0.0	-2.6	
Maximum					64.7	64.8	62.1	0.6	-0.1	
Average					62.5	62.8	61.4	0.3	-1.1	
Total Number of Sites Equal to or Greater than 66.0 dB(A)					0	0	0	---	---	
UC1	Universal Church [NAC D Interior - 51 dB(A)]	1 (Place of Worship)	3243+20	160/160 (SR 80)	39.8	39.9	40.3	0.1	0.5	
CR1	Capri Restaurant (NAC E - Exterior 71 dB(A))	1 (Restaurant)	3246+60	40/40 (SR 80)	65.5	65.5	65.5	0.0	0.0	

Note: NAC = Noise Abatement Criteria; SR = State Road; SB = Southbound; NB = Northbound

Green highlighted cells represent receptor sites impacted by the Build Alternative [i.e., approach [within 1 dB(A)] or exceed the Noise Abatement Criteria of 67 dB(A) for residential and other sensitive land uses or 72 dB(A) for commercial properties (Noise Activity Categories B, C, and E, respectively)].

## 4.0 Noise Barrier Analysis

The FDOT policy requires that the reasonableness and feasibility of noise abatement be considered when the FHWA NAC is approached or exceeded at a noise sensitive site. The most common and effective noise abatement measure for projects such as this is the construction of noise barriers. 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., no intermittent openings), and have sufficient height to block the path between the noise source and the receptor site. The FHWA's *Analysis and Abatement Guidance* (January 2011) indicates 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 noise barrier. As described in Section 3.3, predicted design year traffic noise levels for the Build Alternative will approach or exceed the NAC at six residences within the Town of Glen Ridge and at three special land uses (i.e., recreational areas associated with Flury Park, Renaissance Charter School, and Dreher Park North). Therefore, the feasibility and reasonableness of noise barriers were considered for those noise sensitive sites predicted to be impacted by traffic noise.

A wide range of factors are 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 as well as 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 [5.0 dB(A)] be achieved given certain access, drainage, utility, safety, and maintenance requirements? In addition, for a noise barrier to be considered acoustically feasible, at least two impacted receptor sites must achieve at least a 5 dB(A) reduction.

Reasonableness implies that common sense and good judgment were applied in a decision related to noise abatement. Reasonableness includes the consideration of the cost of abatement, the amount of noise abatement benefit, and the consideration of the viewpoints of the impacted and benefited property owners and tenants. To be deemed reasonable, the noise barrier, or other noise abatement measure, needs to be below FDOT's reasonable cost



criteria, described below, must attain FDOT's noise reduction design goal of 7 dB(A) at one or more impacted receptor sites, and must be supported by a majority of the property owners and tenants benefited by the proposed abatement measure.

The evaluation of noise barriers for impacted residential (Activity Category B) and non-residential areas (Activity Categories A, C, D, and E) are based on different methods and are evaluated separately. 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 for a particular noise abatement measure.

Noise barriers for non-residential areas are assessed using 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 the FDOT's reasonable cost criteria of \$42,000 per benefited receptor site.

Once the noise abatement measure has been determined to be reasonable and feasible, the viewpoint of the impacted and benefited property owners must be considered. During a PD&E Study, the view of benefited receptors (property owners/tenants) regarding noise abatement is gathered during workshops and at the Public Hearing, if one is held. During the Final Design phase of the project, a more detailed process is implemented to include noise abatement workshops and/or public surveys, 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 (property owners and tenants) that respond to the survey. If not supported by a majority of the survey respondents, a noise barrier or abatement measure will not be deemed reasonable.

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 to achieve the desirable 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 dB(A) at one or more impacted receptor sites.

For this project, both ground mounted and shoulder mounted noise barriers were evaluated to determine their effectiveness in providing noise abatement to the impacted noise sensitive sites. Ground mounted noise 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 mounted noise 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. Ground mounted noise barriers are typically evaluated in heights ranging from 8 to 22 feet. Due to safety and constructability issues, the height of shoulder mounted noise barriers is limited to 14 feet, except on structures such as bridges, retaining walls, and MSE walls, where they are limited to 8 feet. Only the noise barrier heights that were effective in maximizing noise reduction were analyzed and are presented in the noise barrier summary tables.





To facilitate the noise barrier analysis, contiguous noise sensitive areas are grouped together into common noise environments (CNEs). A CNE represents a group of impacted receptor sites of the same Activity Category that are exposed to similar noise sources and levels, traffic volumes, traffic mix, and speeds, and topographic features, that would benefit from the same noise barrier or noise barrier system (i.e., overlapping/continuous noise barriers). Generally, CNEs occur between two secondary noise sources, such as interchanges, intersections, and/or cross-roads, or where defined by ground features such as canals or rivers. 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 CNE (e.g., a subdivision or contiguous impact area).

Seven separate CNEs (i.e., E-1 through E-7) were used to assess noise barriers for the noise sensitive sites that approach or exceed the NAC. Three of the impacted residences within the Town of Glen Ridge along SR 80/Southern Boulevard were grouped into separate CNEs (i.e., E-1, E-2, and E-3). The other three impacted residences within the Town of Glen Ridge located along I-95 were grouped into one CNE (E-5). Three other CNEs (E-4, E-6, and E-7) were used for the impacted special land use areas (i.e., Flury Park, Renaissance Charter School, and Dreher Park North). Separate report sections were used to facilitate the review of the locations where noise barriers were considered. **Table 4.1** lists the seven locations where noise abatement was considered for the impacted sites by community or facility name(s) and by CNE. The analysis of noise barriers and recommendations are summarized by CNE in Sections 4.1 through 4.5.

**Table 4.1: Locations Considered for Noise Barriers**

Project Roadway Segment/Cross Roads	Name of Noise Sensitive Site/Area	Type of Noise Sensitive Site (Noise Abatement Criteria Activity Category)	FDOT Noise Abatement Approach Criteria dB(A)	Number of Impacted Receptor Sites	TNM Predicted Design Year Build Alternative Noise Levels dB(A)				Common Noise Environment Identification Number		Noise Barrier Analysis Section
					Minimum	Maximum	Average	Difference Between Existing and Build Alternative	Residential Land Uses	Non-Residential/Special Land Uses	
South of SR 80/Southern Boulevard and West of Gem Lake Road	Glen Ridge (Receptor Site GR1)	Residential (Activity Category B)	66	1	68.9	68.9	68.9	0.8	E-1	---	4.4.1
	Glen Ridge (Receptor Site GR3)	Residential (Activity Category B)	66	1	71.5	71.5	71.5	0.0	E-2	---	
	Glen Ridge (Receptor Site GR6)	Residential (Activity Category B)	66	1	66.3	66.3	66.3	-0.4	E-3	---	
	Flury Park (Receptor Site FP1)	Recreational (Activity Category C)	66	Special Land Use	72.5	72.5	72.5	0.5	---	E-4	4.4.2
West of I-95 and North of Summit Boulevard	Glen Ridge (Receptor Sites GR19, GR22, and GR25)	Residential (Activity Category B)	66	3	66.4	67.8	67.1	-1.2	E-5	---	4.4.3
	Renaissance Charter School (Receptor Sites RC1 and RC2)	Recreational (Activity Category C)	66	Special Land Use	67.2	68.0	67.6	-0.7	---	E-6	4.4.4
West of I-95 and North of Summit Boulevard	Dreher Park North (Receptor Sites DP10-DP12, DP15-DP17, DP21, and DP22)	Residential (Activity Category C)	66	Special Land Use	66.3	72.1	68.8	-5.5	---	E7	4.4.5
Number of Residences that Approach or Exceed the Noise Abatement Criteria				6	---	---	---	---	---	---	---
Number of Special Land Uses that Approach or Exceed the Noise Abatement Criteria				3	---	---	---	---	---	---	---

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#### 4.1 Common Noise Environment E-1 through E-3

Common Noise Environments E-1 through E-3 each include a single-family residence in the Town of Glen Ridge. These three residences, represented by Receptor Sites GR1, GR3, and GR6 are located south of SR 80/Southern Boulevard and east of Congress Avenue (see **Figure 3.3.1 Sheet 4**). The distance from these residences to the nearest SR 80/Southern Boulevard travel lanes with the Build Alternative will be the same as the existing conditions (i.e., no widening is proposed along this segment of SR 80/Southern Boulevard). The predicted design year noise level at these residences with the Build Alternative were 68.9 dB(A), 71.5 dB(A), and 66.3 dB(A), respectively (see **Table 3.3.1**). Since the design year noise levels at this site approached or exceeded the NAC of 67 dB(A), noise barriers were considered as a noise abatement measure at these locations. Since the distances between these three receptor sites are at least 400 feet, they are considered isolated residences and were evaluated as separate CNEs.

For a noise barrier to be considered an acoustically feasible abatement measure, it must benefit at least two impacted receptor sites. Since only one residence is predicted to be impacted in each of the CNEs, noise abatement is not considered acoustically feasible and is not recommended for further consideration at these three single family residences.

#### 4.2 Common Noise Environment E-4

Common Noise Environment E-4 represents a recreational area (i.e., playground) associated with Flury Park located south of SR 80/Southern Boulevard and along the east side of Glen Road (see **Figure 3.3.1 Sheet 4**). The predicted design year noise levels with the proposed improvements at this park average 72.5 dB(A), approximately 0.5 dB(A) higher than existing levels. The entire park represented by Receptor Site FP1 is impacted by traffic noise with the Build Alternative. Since the design year noise levels at this recreational facility exceeded the NAC of 66 dB(A) for Activity Category C, noise barriers were evaluated as a noise abatement measure at this location.

Photograph 1: West side of Flury Park facing east along Glen Road.



The existing and proposed site conditions do not limit the ability to construct a noise barrier at this location. However, the limits of a ground mounted noise barrier are constrained to the east by an access driveway to a commercial property. This access driveway limits the ability to have a long continuous ground mounted noise barrier along the right-of-way for this segment of SR 80/Southern Boulevard.

Four conceptual barrier designs (FP-CD1 through FP-CD4) were evaluated to reduce traffic noise levels at this location. The results of the noise barrier analysis for this area are summarized in **Table 4.2.1**. Of these alternative barrier designs, FP-CD3 is considered the most feasible barrier design at this location. FP-CD3 represents a 14-foot-tall ground mounted noise barrier extending 300 feet along SR 80/Southern Boulevard south right-of-way line (see **Figure 3.3.1 Sheet 4**). FP-CD3 is predicted to result in an average noise reduction of 6.3 dB(A) and maximum reduction of 7.9 dB(A).

**Table 4.2.1: Barrier Evaluation Summary for Flury Park (Playground)**

Noise Barrier Descriptions						Total Estimated Cost	Maximum Noise Reduction dB(A)	Average Noise Reduction dB(A)	Percent of Impacted Area Benefited	Does Barrier Design Meet 7 dB(A) Reduction Goal At Any Site?	Does Barrier Design Provide 5 dB(A) Reduction For Entire Exterior Area of Use Impacted?	Usage Required to be Cost Reasonable (Person Hours per Day)	Actual Usage Likely to Exceed Required Usage to be Cost Reasonable	Does Barrier Design Meet FDOT's Noise Reduction and Cost Reasonableness Criteria?	Conceptual Noise Barrier Design Recommended for further Consideration and Public Input?
Noise Barrier Conceptual Design	Type	Height (Feet)	Length (Feet)	Begin Station	End Station										
FP-CD1	Ground Mounted	10	300	3185+00	3188+00	\$90,000	7.2	5.8	50%	Yes	No	127	No	No	No
FP-CD2	Ground Mounted	12	300	3185+00	3188+00	\$108,000	7.6	6.0	50%	Yes	No	152	No	No	No
FP-CD3	Ground Mounted	14	300	3185+00	3188+00	\$126,000	7.9	6.3	100%	Yes	Yes	177	No	No	No
FP-CD4	Ground Mounted	16	300	3185+00	3188+00	\$144,000	8.1	6.4	100%	Yes	Yes	202	No	No	No

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Draft

The FDOT's special land use methodology was used to determine if the cost of FP-CD3 would be reasonable based on the level of activity expected at this park. The results of this analysis are presented in **Table 4.2.2**. The required daily usage rate (i.e., person-hours per day) for the 14-foot-tall and 300 foot long ground mounted noise barrier is 177 persons per day, each spending a minimum of 1 hour at this park. Due to the small size of the recreational facilities associated with this park (i.e., less than a quarter acre), it is not reasonable to assume that the playground would experience 177 person-hours of usage on a typical day. Therefore, since the expected playground usage is lower than the usage required to meet the FDOT's Special Use Locations criteria, a noise barrier is not considered reasonable at this location. Based on this requirement and likely usage of the recreational facilities per day, Conceptual Barrier Design FP-CD3 is not recommended for further consideration and public input.

### 4.3 Common Noise Environment E-5

Common Noise Environment E-5 includes three single-family residences in the Town of Glen Ridge located west of I-95 and north of Summit Boulevard. These residences are represented by Receptor Sites GR19, GR22, and GR25 (see **Figure 3.3.1 Sheet 1**). The nearest travel lane, the SR80/Southern Boulevard southbound entrance ramp, with the Build Alternative will be approximately 14 to 18 feet closer to these residences than compared to current conditions. With the Build Alternative, the predicted design year noise levels ranged from 66.4 dB(A) to 67.8 dB(A) at the exterior areas of use associated with these residential units (see **Table 3.3.1**). Since the design year noise levels at these sites approached or exceeded the NAC of 67 dB(A), noise barriers were considered as a noise abatement measure at this location.

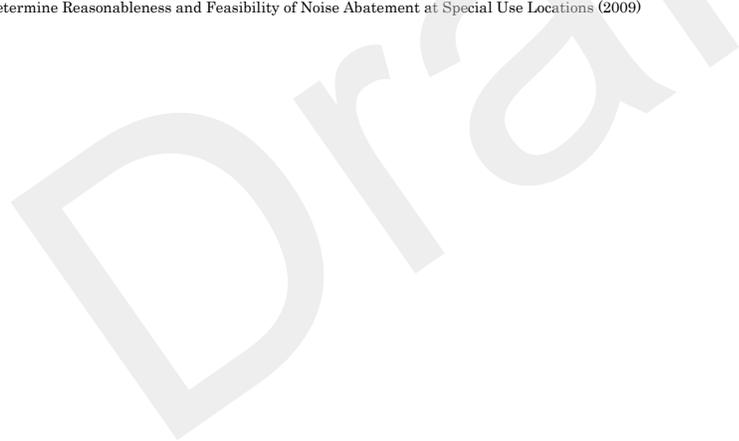
Site conditions at this location, including access driveways and drainage facilities, do not limit the construction of a noise barrier using standard construction methods. Currently, no existing, conforming, and legally permitted outdoor advertising signs are located in this area or need to be considered.

**Table 4.2.2: Conceptual Noise Barrier Design - Usage Analysis for Flury Park**

Item	Criteria	Actual Usage	Needed Usage to Meet FDOT's Cost Reasonableness Criteria (Input Data)				Units
			Conceptual Noise Barrier Design Number				
			FP-CD1	FP-CD2	FP-CD3	FP-CD4	
1	Enter Length of Proposed Noise Barrier (Begin Station 1707+20/End Station 1714+20)	---	300	300	300	300	feet
2	Enter Height of Proposed Noise Barrier	---	10	12	14	16	feet
3	Total Square Feet of Proposed Noise Barrier (Multiply item 1 by Item 2)	---	3,000	3,600	4,200	4,800	feet <sup>2</sup>
4	Enter the average amount of time that a person stays at the site per visit	Unknown	1	1	1	1	hours
5	Enter the average number of people that use this site per day that will receive at least 5 dB(A) benefit from abatement at the site	Unknown	127	152	177	202	persons
6	Total Person Hours per Day Benefited by Noise Barrier (Multiply Item 4 by Item 5)	---	127	152	177	202	person-hours
7	Average Square Foot of Noise Barrier per Person Hour (Divide Item 3 by Item 6)	---	23.71	23.71	23.71	23.71	feet <sup>2</sup> /person-hours
8	Cost per Person Hour per Square Foot of Noise Barrier (Multiply Item 7 by \$42,000)	N/A	\$995,935	\$995,935	\$995,935	\$995,935	\$/person-hours/ft <sup>2</sup>
9	Does item 8 exceed the "abatement cost factor" of: \$995,935/person-hour/ft <sup>2</sup> ?	N/A	No	No	No	No	Yes/No
10	If item 9 is no, abatement is cost reasonable.	N/A	N/A	N/A	N/A	N/A	---
11	If item 9 is yes, abatement is not cost reasonable.	N/A	N/A	N/A	N/A	N/A	---

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Source: FDOT Report - A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations (2009)



Three conceptual barrier designs (GR-CD1 through GR-CD3) were evaluated to reduce traffic noise levels at this location. The results of the noise barrier analysis for this area are summarized in **Table 4.3.1**. Two of the conceptual noise barrier designs, GR-CD2 and GR-CD3, meet the minimum requirements for a noise barrier to achieve the noise reduction design goal at this location. The most cost effective design is GR-CD2, which represents a combination barrier including a 22-foot-tall ground mounted noise barrier located 5 feet inside the I-95 western right-of-way line extending 1,500 feet from Stations 1300+00 to 1315+00 and an 8-foot-tall shoulder mounted noise barrier located along the outside shoulder of I-95 extending 300 feet from Station 1298+00 to 1301+00 (see **Figure 3.3.1 Sheet 1**). This conceptual design provides 5.0 dB(A) of noise reduction to the three impacted residences and at least 7.0 dB(A) of noise reduction (design goal) at one of the impacted residences. The estimated construction cost of this conceptual noise barrier design is \$1,062,000 or \$212,400 per benefited receptor site which exceeds the reasonable cost of \$42,000 per benefited receptor site. Therefore, noise abatement is not considered cost reasonable and is not recommended for further consideration at this location.

#### 4.4 Common Noise Environment E-6

Common Noise Environment E-6 represents a recreational area (i.e., sports field and playground) associated with the Renaissance Charter School at Summit (maximum enrollment is 1,125 students, according to the school website) located west of I-95 and north of Summit Boulevard (see **Figure 3.1.1 Sheet 1**). The predicted design year noise levels with the proposed improvements at this recreational facility range from 64.3 dB(A) to 68.0 dB(A), an average of approximately 0.6 dB(A) lower than existing levels. Two of the four Receptor Sites (RC1 and RC2) modeled at this location were impacted by traffic noise with the Build Alternative. Since the design year noise levels at this recreational facility exceeded the NAC of 66 dB(A) for Activity Category C, noise barriers were evaluated as a noise abatement measure at this location.

Site conditions at this location, including access driveways and drainage facilities, do not limit the construction of a noise barrier using standard construction methods. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area or need to be considered.

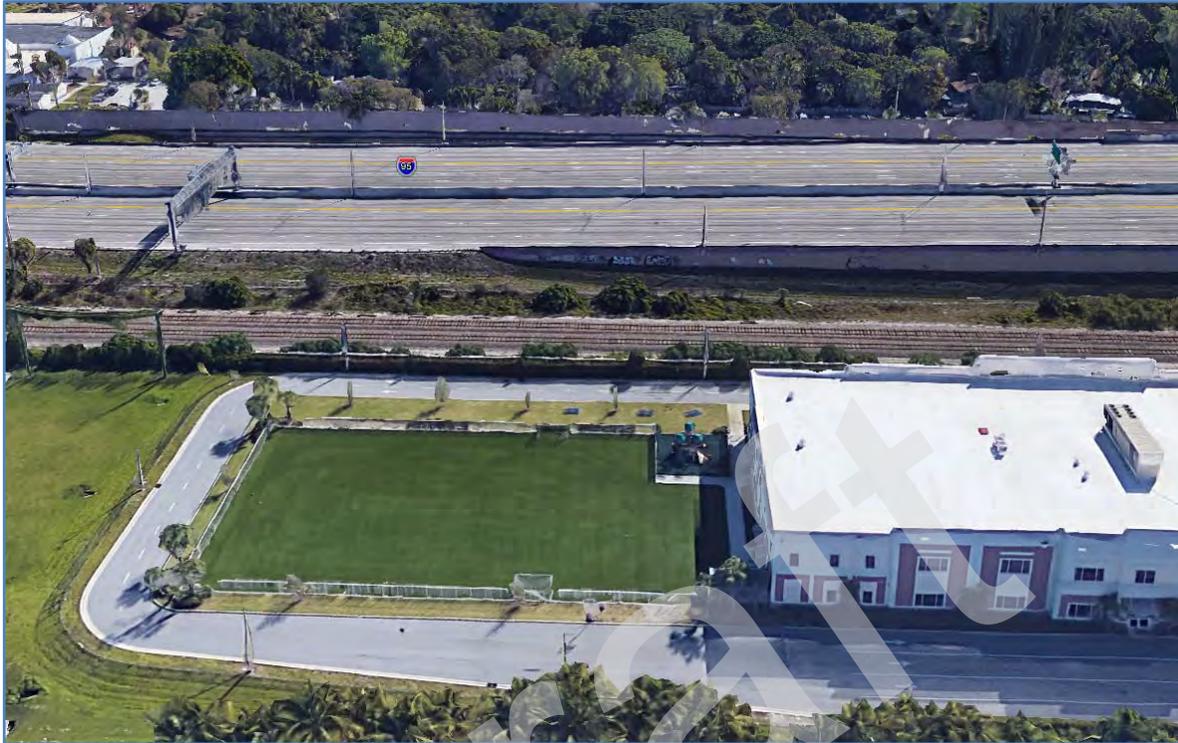
Table 4.3.1: Noise Barrier Analyses for Common Noise Environment E-5 Town of Glen Ridge Single Family Residences Located West of I-95 and North of Summit Boulevard

Noise Impacted Area Identifier (Station Range; General Location/Cross Streets)	Conceptual Noise Barrier Design Number	Noise Barrier Type	Noise 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
Common Noise Environment E-5 Town of Glen Ridge Single Family Residences (Stations 1306+00 to 1313+00; West of I-95 and North of Summit Boulevard)	GR-CD1	Ground Mounted	I-95 Western Right-of-Way Line	22	1,500	1300+00	1315+00	3	6.1 (6.8)	3	1	4	5.8	\$990,000	\$247,500	Conceptual barrier design does not meet either the 7.0 dB(A) noise reduction design goal or the reasonable cost criteria of \$42,000 per benefited site
	GR-CD2	Shoulder Mounted	I-95 Southbound Outside Shoulder - North of Summit Boulevard	8	300	1298+00	1301+00	3	6.3 (7.0)	3	2	5	5.8	\$1,062,000	\$212,400	Conceptual barrier design does not meet the reasonable cost criteria of \$42,000 per benefited site
		Ground Mounted	I-95 Western Right-of-Way Line	22	1,500	1300+00	1315+00									
	GR-CD3	Shoulder Mounted	I-95 Southbound Outside Shoulder - North of Summit Boulevard	8	500	1298+00	1303+00	3	6.3 (7.0)	3	2	5	5.9	\$1,080,000	\$216,000	
				14	300	1303+00	1306+00									
		Ground Mounted	I-95 Western Right-of-Way Line	20	1,600	1300+00	1316+00									

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**Photograph 2:** West side of Renaissance Charter School (Sports Field and Playground) facing east towards I-95.



Two conceptual barrier designs (RC-CD1 and RC-CD2) were evaluated to reduce traffic noise levels at this location. The results of the noise barrier analysis for this area are summarized in **Table 4.4.1**. Only conceptual noise barrier design RC-CD2 meets the minimum requirements for a noise barrier to achieve the noise reduction design goal at this location. RC-CD2 represents a combination barrier including a 22-foot-tall ground mounted noise barrier located 5 feet inside the I-95 western right-of-way line extending 900 feet from Stations 1299+00 to 1308+00 and an 8-foot-tall shoulder mounted noise barrier located along the outside shoulder of I-95 extending 500 feet from Station 1297+00 to 1302+00. RC-CD2 would benefit the entire recreational area and is predicted to result in an average noise reduction of 6.5 dB(A) and maximum reduction of 7.0 dB(A).

The FDOT's special land use methodology was used to determine if the cost of RC-CD2 would be reasonable based on the level of activity expected at this facility. The results of this analysis are presented in **Table 4.4.2**. The required daily usage rate (i.e., person-hours

**Table 4.4.1: Barrier Evaluation Summary for Renaissance Charter School at Summit (Playground and Sports Field)**

Noise Barrier Descriptions						Total Estimated Cost	Maximum Noise Reduction dB(A)	Average Noise Reduction dB(A)	Percent of Impacted Area Benefited	Does Barrier Design Meet 7 dB(A) Reduction Goal At Any Site?	Does Barrier Design Provide 5 dB(A) Reduction For Entire Exterior Area of Use Impacted?	Usage Required to be Cost Reasonable (Person Hours per Day)	Actual Usage Likely to Exceed Required Usage to be Cost Reasonable	Does Barrier Design Meet FDOT's Noise Reduction and Cost Reasonableness Criteria?	Conceptual Noise Barrier Design Recommended for further Consideration and Public Input?
Noise Barrier Conceptual Design	Type	Height (Feet)	Length (Feet)	Begin Station	End Station										
RC-CD1	Ground Mounted	22	1,320	1298+00	1311+00	\$871,200	6.3	5.7	100%	No	Yes	1,225	No	No	No
RC-CD2	Ground Mounted	22	900	1299+00	1308+00	\$714,000	7.0	6.5	100%	Yes	Yes	1,004	No	No	No
	Shoulder Mounted	8	500	1297+00	1301+00										

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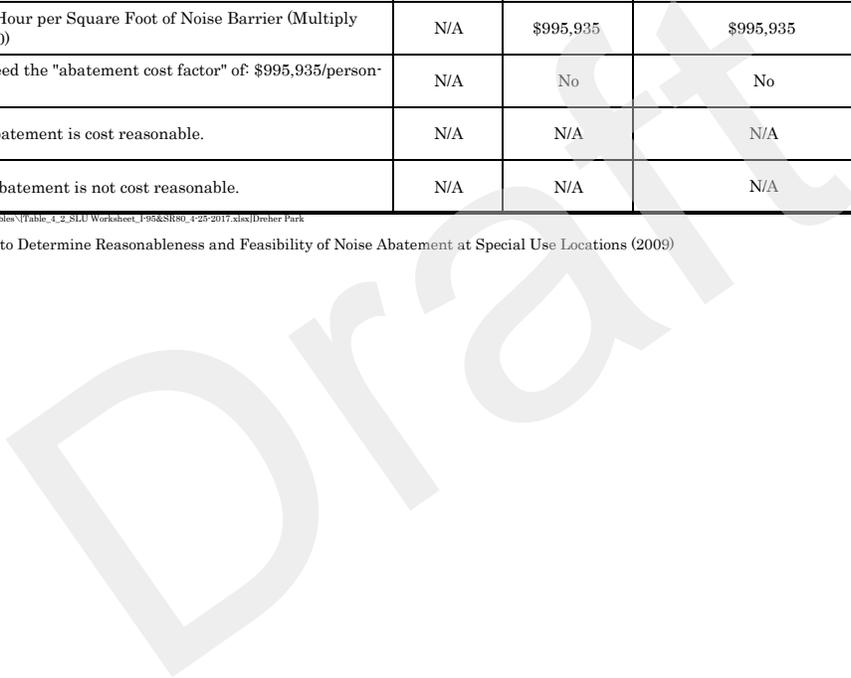
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**Table 4.4.2: Conceptual Noise Barrier Design - Usage Analysis for Renaissance Charter School at Summit**

Item	Criteria	Actual Usage	Needed Usage to Meet FDOT's Cost Reasonableness Criteria (Input Data)			Units
			Conceptual Noise Barrier Design Number			
			RC-CD1	RC-CD2		
1	Enter Length of Proposed Noise Barrier (Begin Station 1707+20/End Station 1714+20)	---	1,320	8	900	feet
2	Enter Height of Proposed Noise Barrier	---	22	500	22	feet
3	Total Square Feet of Proposed Noise Barrier (Multiply item 1 by Item 2)	---	29,040	23,800		feet <sup>2</sup>
4	Enter the average amount of time that a person stays at the site per visit	Unknown	1	1		hours
5	Enter the average number of people that use this site per day that will receive at least 5 dB(A) benefit from abatement at the site	Unknown	1,225	1,004		persons
6	Total Person Hours per Day Benefited by Noise Barrier (Multiply Item 4 by Item 5)	---	1,225	1,004		person-hours
7	Average Square Foot of Noise Barrier per Person Hour (Divide Item 3 by Item 6)	---	23.71	23.71		feet <sup>2</sup> /person-hours
8	Cost per Person Hour per Square Foot of Noise Barrier (Multiply Item 7 by \$42,000)	N/A	\$995,935	\$995,935		\$/person-hours/ft <sup>2</sup>
9	Does item 8 exceed the "abatement cost factor" of: \$995,935/person-hour/ft <sup>2</sup> ?	N/A	No	No		Yes/No
10	If item 9 is no, abatement is cost reasonable.	N/A	N/A	N/A		---
11	If item 9 is yes, abatement is not cost reasonable.	N/A	N/A	N/A		---

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Source: FDOT Report - A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations (2009)



per day) for RC-CD2 is 1,004 persons per day, each spending a minimum of one hour at this park. Due to the small size of the recreational facilities associated with this special land use site (i.e., approximately 1/2 acre), it is not reasonable to assume that this area would experience 1,004 person-hours of usage on a typical day. Therefore, since the expected playground usage is lower than the usage required to meet the FDOT's Special Use Locations criteria, a noise barrier is not considered reasonable at this location. Therefore, based on this requirement and likely usage of the recreational facilities per day, Conceptual Barrier Design RC-CD2 is not recommended for further consideration and public input.

#### 4.5 Common Noise Environment E-7

Common Noise Environment E-7 represents the recreational areas (i.e., trails and picnic pavilions) associated with Dreher Park North. This park is located east of I-95 and south of SR 80/Southern Boulevard and encompasses approximately 44 acres (see **Figure 3.1.1 Sheets 1, 2, and 6**). The predicted design year noise levels with the proposed improvements at this recreational facility range from 58.5 dB(A) to 72.1 dB(A), an average of approximately 3.9 dB(A) lower than existing levels. This area will experience a decrease in traffic noise levels up to 7.9 dB(A) due to the proposed concrete barrier wall that will block tire noise from I-95. Eight of the 32 Receptor Sites modeled at this location were impacted by traffic noise with the Build Alternative. The Receptor Sites exceeding 66.0 dB(A) include DP10 through DP12, DP15 through DP17, DP21, and DP22, and are located in the southwestern area of the park, within ~275 feet of I-95. Approximately 5.25 acres of the park are exposed to traffic noise levels above the NAC of 66 dB(A) for Activity Category C. Since the design year noise levels at this recreational facility exceeded the NAC of 66 dB(A) for Activity Category C, noise barriers were evaluated as a noise abatement measure at this location.

Two conceptual barrier designs (DP-CD1 and DP-CD2) were evaluated to reduce traffic noise levels at this location. The results of the noise barrier analysis for this area are summarized in **Table 4.5.1**. Only conceptual noise barrier design DP-CD2 meets the minimum requirements for a noise barrier to achieve the noise reduction design goal at this location. DP-CD2 represents a 22-foot-tall ground mounted noise barrier located 5 feet

**Table 4.5.1: Barrier Evaluation Summary for Dreher Park North (Trails and Pavilions)**

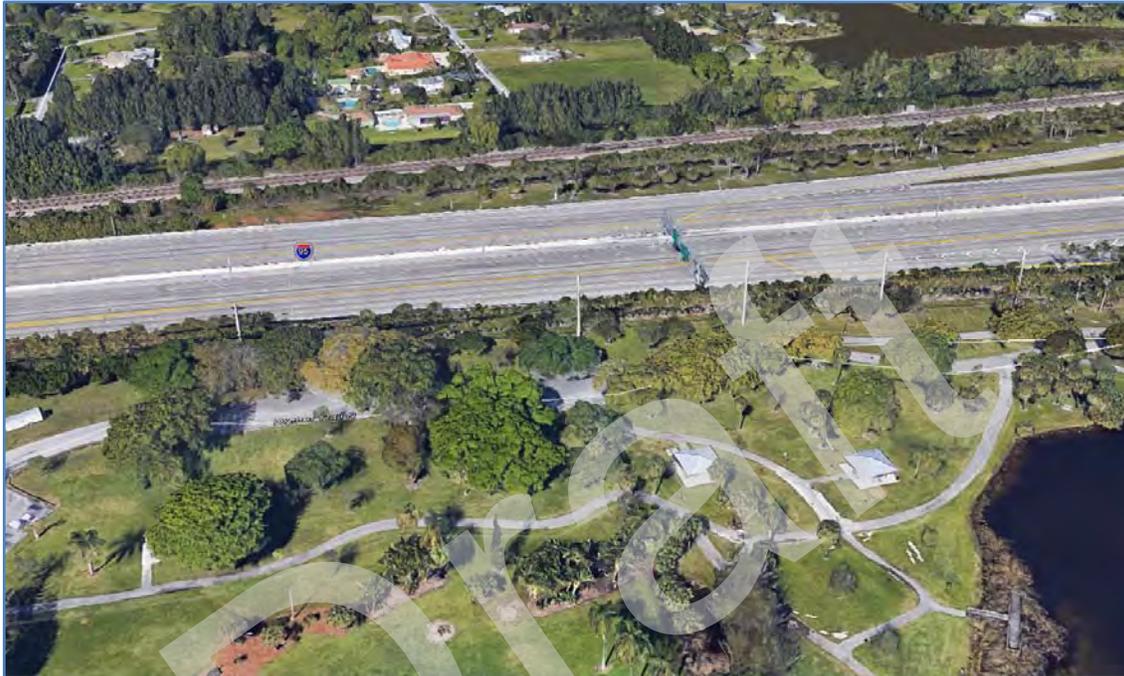
Noise Barrier Descriptions						Total Estimated Cost	Maximum Noise Reduction dB(A)	Average Noise Reduction dB(A)	Percent of Impacted Area Benefited	Does Barrier Design Meet 7 dB(A) Reduction Goal At Any Site?	Does Barrier Design Provide 5 dB(A) Reduction For Entire Exterior Area of Use Impacted?	Usage Required to be Cost Reasonable (Person Hours per Day)	Actual Usage Likely to Exceed Required Usage to be Cost Reasonable	Does Barrier Design Meet FDOT's Noise Reduction and Cost Reasonableness Criteria?	Conceptual Noise Barrier Design Recommended for further Consideration and Public Input?
Noise Barrier Conceptual Design	Type	Height (Feet)	Length (Feet)	Begin Station	End Station										
DP-CD1	Ground Mounted	20	1,600	1306+00	1321+00	\$960,000	8.6	6.1	75%	Yes	No	1,349	No	No	No
DP-CD2	Ground Mounted	22	1,500	1305+00	1321+00	\$990,000	9.2	6.6	100%	Yes	Yes	1,392	No	No	No

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inside the I-95 eastern right-of-way line extending 1,500 feet from Stations 1305+00 to 1321+00 (see **Figure 3.1.1 Sheets 1 and 2**). RC-CD2 would benefit all of the recreational area impacted by the project and is predicted to result in an average noise reduction of 6.6 dB(A) and maximum reduction of 9.2 dB(A).

**Photograph 3: East side of Dreher Park North facing west towards I-95.**



The FDOT's special land use methodology was used to determine if the cost of DP-CD2 would be reasonable based on the level of activity expected at this park. The results of this analysis are presented in **Table 4.5.2**. The required daily usage rate (i.e., person-hours per day) for the DP-CD2 is 1,392 persons per day, each spending a minimum of one hour at this park. Due to the passive nature of the recreational facilities associated with this park, it is not reasonable to assume that this area would experience 1,392 person-hours of usage on a typical day. Therefore, since the expected park usage is lower than the usage required to meet the FDOT's Special Use Locations criteria, a noise barrier is not considered reasonable at this location. Therefore, based on this requirement and likely usage of the recreational facilities per day, Conceptual Barrier Design RC-CD2 is not recommended for further consideration and public input.

**Table 4.5.2: Conceptual Noise Barrier Design - Usage Analysis for Dreher Park North**

Item	Criteria	Actual Usage	Needed Usage to Meet FDOT's Cost Reasonableness Criteria (Input Data)		Units
			Conceptual Noise Barrier Design Number		
			DP-CD1	DP-CD2	
1	Enter Length of Proposed Noise Barrier (Begin Station 1707+20/End Station 1714+20)	---	1,600	1,500	feet
2	Enter Height of Proposed Noise Barrier	---	20	22	feet
3	Total Square Feet of Proposed Noise Barrier (Multiply item 1 by Item 2)	---	32,000	33,000	feet <sup>2</sup>
4	Enter the average amount of time that a person stays at the site per visit	Unknown	1	1	hours
5	Enter the average number of people that use this site per day that will receive at least 5 dB(A) benefit from abatement at the site	Unknown	1,349	1,392	persons
6	Total Person Hours per Day Benefited by Noise Barrier (Multiply Item 4 by Item 5)	---	1,349	1,392	person-hours
7	Average Square Foot of Noise Barrier per Person Hour (Divide Item 3 by Item 6)	---	23.71	23.71	feet <sup>2</sup> /person-hours
8	Cost per Person Hour per Square Foot of Noise Barrier (Multiply Item 7 by \$42,000)	N/A	\$995,935	\$995,935	\$/person-hours/ft <sup>2</sup>
9	Does item 8 exceed the "abatement cost factor" of: \$995,935/person-hour/ft <sup>2</sup> ?	N/A	No	No	Yes/No
10	If item 9 is no, abatement is cost reasonable.	N/A	N/A	N/A	---
11	If item 9 is yes, abatement is not cost reasonable.	N/A	N/A	N/A	---

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Source: FDOT Report - A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations (2009)

## 5.0 Summary

A traffic noise study was performed in accordance with 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (July 13, 2010) and the FDOT's PD&E Manual, Part 2, Chapter 17, Highway Traffic Noise (July 27, 2016). Design year traffic noise levels (2040) for the Build Alternative will approach or exceed the NAC at six residences within the Town of Glen Ridge and at three special land uses [i.e., recreational areas associated with Flury Park, Dreher Park North, and Renaissance Charter School]. Therefore, the feasibility and reasonableness of noise barriers were considered for those noise sensitive sites predicted to be impacted by traffic noise.

Seven separate common noise environments (i.e., E1 through E7) were used to assess noise barriers for these seven noise sensitive areas/sites that approach or exceed the NAC. Three of the impacted residences with the Town of Glen Ridge along SR 80/Southern Boulevard were grouped into separate common noise environments (i.e., E-1, E-2, and E-3). The other three impacted residences within the Town of Glen Ridge located along I-95 were grouped into one common noise environment (E5). Three other common noise environments (E-4, E-6, and E-7) were used for the impacted special land use areas (i.e., Flury Park, Renaissance Charter School, and Dreher Park North). The results of the noise barrier analyses for each of these seven impacted common noise environments are summarized in **Table 5.1** as well as in Sections 4.1 through 4.5.

Noise barriers at the six impacted residences within the Town of Glen Ridge and at the three special land uses were determined to not be feasible or cost reasonable. At these locations either the cost to construct noise barriers exceeded FDOT's reasonable cost criteria of \$42,000 per benefited site for the residential sites and/or barriers were determined to not be acoustically feasible. For a noise barrier to be considered an acoustically feasible abatement measure, it must benefit at least two impacted receptor sites. For the Flury Park, Renaissance Charter School, and Dreher Park North, the likely usage of these recreational facilities were insufficient to meet the minimum person-hours per day required to meet FDOT's reasonable cost criteria. Therefore, noise barriers are not recommended for further consideration or construction at these locations. Despite noise

Table 5.1: Noise Barrier Evaluation Summary

Project Roadway Segment/Cross Roads	Name of Noise Sensitive Site (Area)/Type of Noise Sensitive Site (Noise Abatement Criteria Activity Category)	Common Noise Environment Identification Number	Optimal Conceptual Noise Barrier Design Identification	Noise Barrier Type	Height (Feet)	Length (Feet)	Begin Station Number	End Station Number	Number of Impacted Receptor Sites	Average (Maximum) Noise Reduction for Impacted Receptor Sites	Total Number of Benefited Receptor Sites	Average Noise Reduction for all Benefited Receptor Sites	Estimated Cost (\$30.00 per square foot)	Average Cost per Site Benefited	Does Optimal Barrier Design Meet FDOT's Reasonable Noise Abatement Criteria of \$42,000 per Benefited Receptor Site and 7.0 dB(A) Noise Reduction Design Goal?	Noise Barrier Recommended for Further Consideration and Public Input?
South of SR 80/Southern Boulevard and West of Gem Lake Road	Glen Ridge (Receptor Site GR1)/ Residential (Activity Category B)	E-1	---		---	---	---	---	1	---	---	---	---	---	No (Only One Impacted Residence; Not Acoustically Feasible)	No
	Glen Ridge (Receptor Site GR3)/ Residential (Activity Category B)	E-2	---		---	---	---	---	1	---	---	---	---	---	No (Only One Impacted Residence; Not Acoustically Feasible)	No
	Glen Ridge (Receptor Site GR6)/ Residential (Activity Category B)	E-3	---		---	---	---	---	1	---	---	---	---	---	No (Only One Impacted Residence; Not Acoustically Feasible)	No
	Flury Park (Receptor Site FP1)/ Recreational (Activity Category C)	E-4	FP-CD3	Ground Mounted	14	300	3185+00	3188+00	Special Land Use	6.3 (7.9)	---	---	\$163,800	---	No (Usage of Facility Less Than Required to be Cost Reasonable)	No
West of I-95 and North of Summit Boulevard	Glen Ridge (Receptor Sites GR19, GR22, and GR25)	E-5	GR-CD2	Shoulder Mounted	8	300	1298+00	1301+00	3	6.3 (7.0)	5	5.8	\$1,062,000	\$212,400	Conceptual Barrier Design Does Not Meet the Reasonable Cost Criteria of \$42,000 per Benefited Site	No
				Ground Mounted	22	1500	1300+00	1315+00								
	Reniassance Charter School (Receptor Sites RC1 and RC2)/ Recreational (Activity Category C)	E-6	RC-CD2	Shoulder Mounted	8	500	1297+00	1301+00	Special Land Use	6.5 (7.0)	---	---	\$714,000	---	No (Usage of Facility Less Than Required to be Cost Reasonable)	No
				Ground Mounted	22	900	1299+00	1308+00								
West of I-95 and North of Summit Boulevard	Dreher Park North (Receptor Sites DP10-DP12, DP15-DP17, DP21, and DP22)/ Recreational (Activity Category C)	E-7	DP-CD2	Ground Mounted	22	1500	1305+00	1321+00	Special Land Use	6.6 (9.2)	---	---	\$1,287,000	---	No (Usage of Facility Less Than Required to be Cost Reasonable)	No

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barriers not being recommended, FDOT is committed to the construction of feasible and reasonable noise abatement measures at noise-impacted locations, contingent upon the following conditions: a) a design noise analysis to support the need, feasibility, and reasonableness for providing abatement; and b) the cost analysis indicates that the cost of the noise barriers will not exceed the cost reasonable criterion.

Based on the noise analyses performed to date, there appears to be no apparent solutions available to mitigate the noise impacts at these locations representing six residences and three special land uses where noise barriers were not recommended. The traffic noise impacts to these noise sensitive sites are an unavoidable consequence of the project. Because of the low number of unavoidable impacts (i.e., six residences and three recreational land uses), the noise impacts associated with this project are not considered significant.

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## 6.0 Construction Noise and Vibration

During construction of the project, there is the potential for noise impacts to be substantially greater than those resulting from normal traffic operations because heavy equipment is typically used to build roadways. In addition, construction activities may result in vibration impacts. Therefore, early identification of potential noise/vibration sensitive sites along the project corridor is important in minimizing noise and vibration impacts. The project area does include residential, commercial, and institutional land uses including schools and places of worship. Construction noise and vibration impacts to these sites will be minimized by adherence to the controls listed in the latest edition of the FDOT's Standard Specifications for Road and Bridge Construction. Vibration sensitive facilities within the project limits include the following: Palm Beach Shambhala Meditation Center, SM1; South Florida Science Center and Aquarium, SC1; Holy Cross Church/School, HS1; and Universal Church, UC1. A reassessment of the project corridor for additional sites particularly sensitive to construction noise and/or vibration will be performed during design to ensure that impacts to such sites are minimized.





## 7.0 Coordination with Local Officials

To aid in promoting land use compatibility, a copy of the Noise Study Report, which provides information that can be used to protect future land development from becoming incompatible with anticipated traffic noise levels, will be provided to Palm Beach County. In addition, generalized future noise impact contours for the properties in the immediate vicinity of the project have been developed for NAC B/C and E (i.e., residential, other sensitive land uses, and sensitive commercial land uses, respectively). These contours represent the approximate distance from the edge of the nearest proposed travel lane of SR 80/Southern Boulevard and I-95 to the limits of the area predicted to approach [i.e., within 1 dB(A)] or exceed the NAC in the design year 2040. These contours do not consider any shielding of noise provided by structures between the receptor site and the proposed travel lanes. Within the project corridor, the distance between the proposed edge of the outside travel lane and the noise contour line at various locations is presented in **Table 7.1**. To minimize the potential for incompatible land use, noise sensitive land uses should be located beyond these distances.



Table 7.1: Design Year (2040) Noise Impact Contour Distances

Roadway Segment	Distance from Proposed Nearest Travel Lane to Noise Contour (Feet)*	
	66 dB(A) - Activity Category B/C	71 dB(A) - Activity Category E
I-95 - North of Summit Boulevard	330	90
SR 80 - Australian Avenue to Gem Lake Drive	160	65
SR 80 - Gem Lake Drive to I-95	25	< 10
SR 80 - I-95 to Parker Avenue	< 10	< 10

\*Note: Distances do not include existing noise walls or concrete barrier walls.

Draft



## 8.0 References

23 CFR Part 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise", Federal Register, Vol. 75, No. 133, Tuesday, July 13, 2010; pages 39834-39839.

Federal Highway Administration Report FHWA-HEP-10-025, "Highway Traffic Noise: Analysis and Abatement Guidance", June 2010 (revised December, 2010); 76 pages.

Federal Highway Administration Report FHWA-PD-96-009, "FHWA Traffic Noise Model, Version 1.0 User's Guide", January 1998; 192 pages + supplements.

Federal Highway Administration Report Number FHWA-PD-96-046, "Measurement of Highway-Related Noise", Cynthia S.Y. Lee and Gregg Fleming; May, 1996; 206 pages.

Federal Highway Administration Report FHWA-HEP-06-015, "FHWA Highway Construction Noise Handbook: Final Report". August 2006; 185 pages.

"A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations", Roger L. Wayson and John M. MacDonald, University of Central Florida; Updated July 22, 2009; 64 pp. Available from: Florida Department of Transportation, Environmental Management Office, 605 Suwannee Street, M.S. 37, Tallahassee, FL 32399-0450.

Florida Department of Transportation. "Noise Analysis", Part 2, Chapter 17. Project Development and Environment Manual, Florida Department of Transportation, Tallahassee, July 27, 2016.

Florida Department of Transportation Plans Preparation (Topic No. 625-000-007) Manual Volume 1, Chapter 32, "Sound Barrier Walls", January 2017; 16 pages.

Florida Department of Transportation "Standard Specifications for Road and Bridge Construction", January 2017.





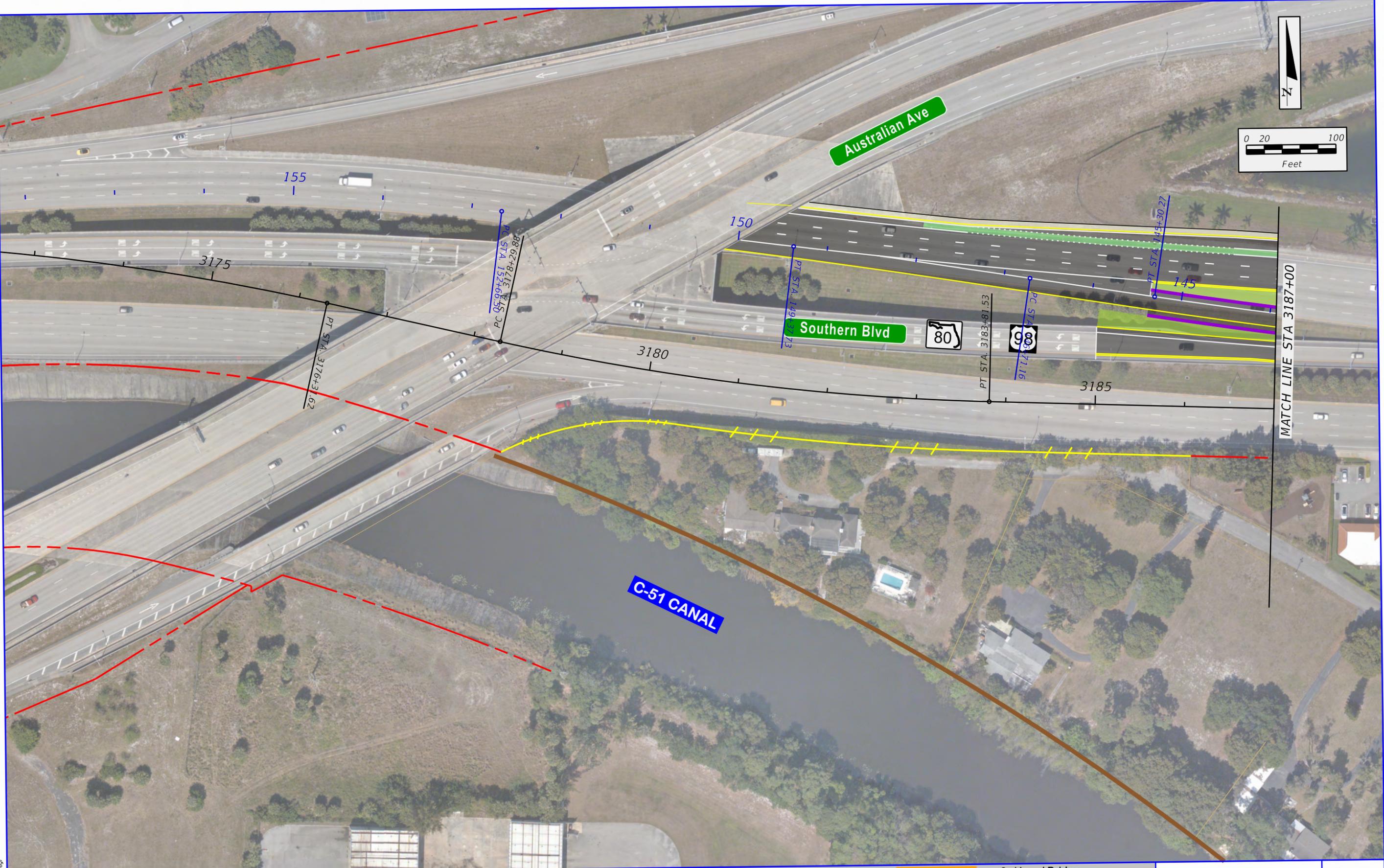
## APPENDIX A

# Preliminary Design Concept Plans for Alternative 4

Source: Preliminary Engineering Report - Appendix B  
Recommended Alternative (Concept Plans)



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**SR 9 / I-95 AT SR 80 / SOUTHERN BOULEVARD**  
**INTERCHANGE PD&E STUDY**  
 FPID: 435516-1-22-02; ETDM No: 14183

- - - - - Existing ROW
- - - - - Existing Limited Access ROW
- - - - - Proposed ROW
- - - - - Proposed Limited Access ROW

- City / Town Limits
- Property Line
- Pavement
- 2nd Level Bridge

- 3rd Level Bridge
- Special Bicycle Lane Treatment
- Sidewalk
- Retaining Wall

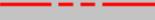
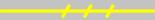
**APPENDIX B**  
**ALTERNATIVE 4 -**  
**EB - NB & NB-WB DUAL**  
**3rd-LEVEL FLYOVERS**

SHEET NO.  
**B-1**

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**SR 9 / I-95 AT SR 80 / SOUTHERN BOULEVARD INTERCHANGE PD&E STUDY**  
 FPID: 435516-1-22-02; ETDM No: 14183

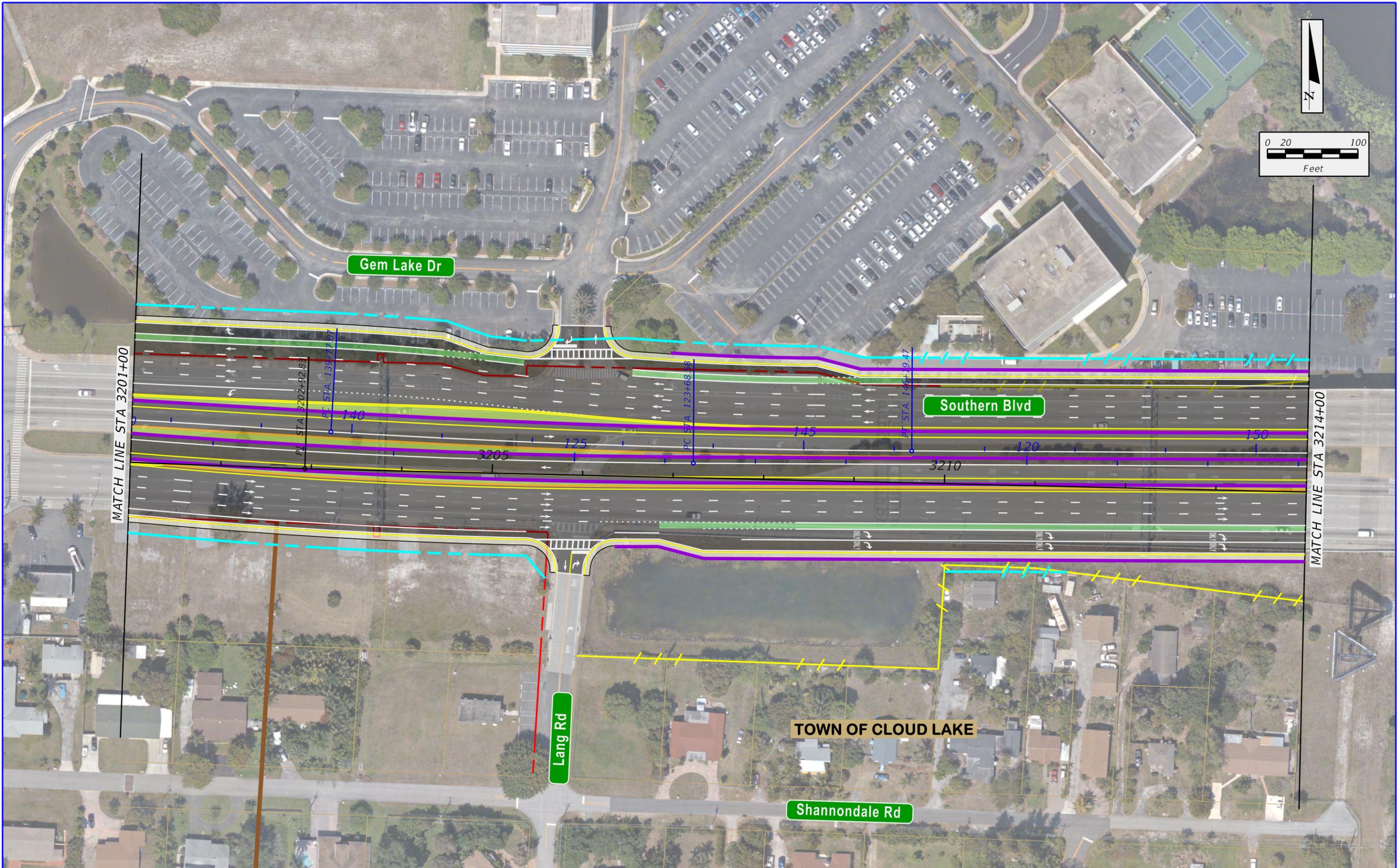
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	Existing Limited Access ROW		Property Line
	Proposed ROW		Pavement
	Proposed Limited Access ROW		2nd Level Bridge

	3rd Level Bridge
	Special Bicycle Lane Treatment
	Sidewalk
	Retaining Wall

**APPENDIX B**  
**ALTERNATIVE 4 -**  
**EB - NB & NB-WB DUAL**  
**3rd-LEVEL FLYOVERS**

SHEET NO.  
**B-2**

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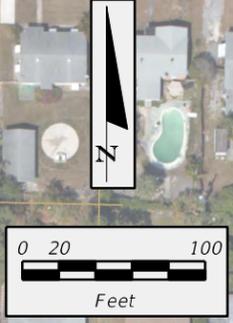
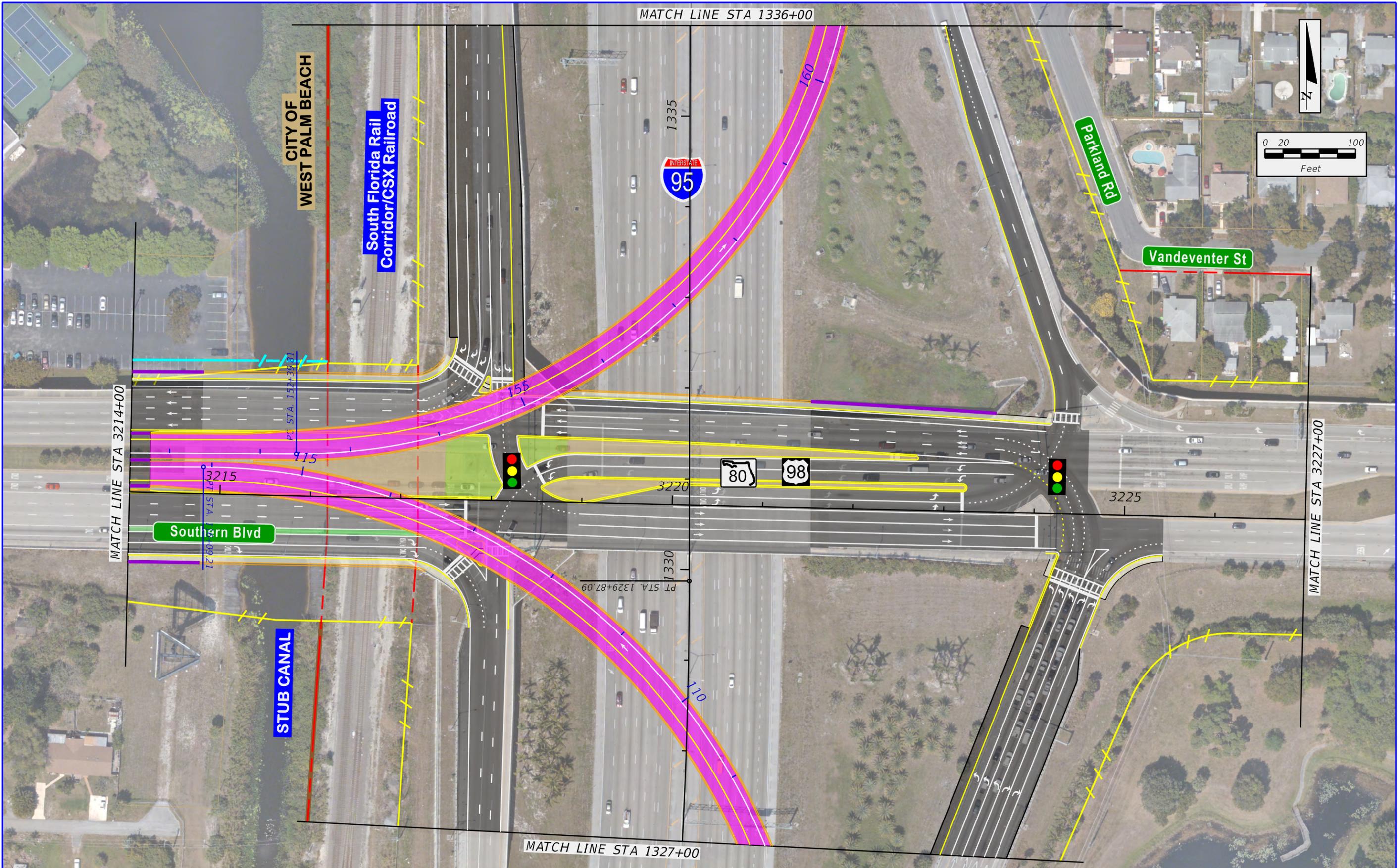


MATCH LINE STA 3201+00

MATCH LINE STA 3214+00

<p>SR 9 / I-95 AT SR 80 / SOUTHERN BOULEVARD INTERCHANGE PD&amp;E STUDY FPID: 435516-1-22-02; ETDM No: 14183</p>	Existing ROW	City / Town Limits	3rd Level Bridge	<p><b>APPENDIX B</b> <b>ALTERNATIVE 4 -</b> <b>EB - NB &amp; NB-WB DUAL</b> <b>3rd-LEVEL FLYOVERS</b></p>	<p>SHEET NO. <b>B-3</b></p>
	Existing Limited Access ROW	Property Line	Special Bicycle Lane Treatment		
Proposed ROW	Pavement	2nd Level Bridge	Sidewalk		
Proposed Limited Access ROW	Retaining Wall				

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**SR 9 / I-95 AT SR 80 / SOUTHERN BOULEVARD**  
**INTERCHANGE PD&E STUDY**  
 FPID: 435516-1-22-02; ETDM No: 14183

	Existing ROW		City / Town Limits		3rd Level Bridge
	Existing Limited Access ROW		Property Line		Special Bicycle Lane Treatment
	Proposed ROW		Pavement		Sidewalk
	Proposed Limited Access ROW		2nd Level Bridge		Retaining Wall

**APPENDIX B**  
**ALTERNATIVE 4 -**  
**EB - NB & NB-WB DUAL**  
**3rd-LEVEL FLYOVERS**

SHEET NO.  
**B-4**

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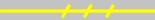


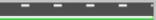
	<b>SR 9 / I-95 AT SR 80 / SOUTHERN BOULEVARD INTERCHANGE PD&amp;E STUDY</b> FPID: 435516-1-22-02; ETDM No: 14183	Existing ROW	City / Town Limits	3rd Level Bridge	<b>APPENDIX B          ALTERNATIVE 4 -          EB - NB &amp; NB-WB DUAL          3rd-LEVEL FLYOVERS</b>	SHEET NO.
		Existing Limited Access ROW	Property Line	Special Bicycle Lane Treatment		B-5
		Proposed ROW	Pavement	Sidewalk		
		Proposed Limited Access ROW	2nd Level Bridge	Retaining Wall		

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**SR 9 / I-95 AT SR 80 / SOUTHERN BOULEVARD INTERCHANGE PD&E STUDY**  
 FPID: 435516-1-22-02; ETDM No: 14183

	Existing ROW		City / Town Limits
	Existing Limited Access ROW		Property Line
	Proposed ROW		Pavement
	Proposed Limited Access ROW		2nd Level Bridge

	3rd Level Bridge
	Special Bicycle Lane Treatment
	Sidewalk
	Retaining Wall

**APPENDIX B**  
**ALTERNATIVE 4 -**  
**EB - NB & NB-WB DUAL**  
**3rd-LEVEL FLYOVERS**

SHEET NO.  
**B-6**

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**SR 9 / I-95 AT SR 80 / SOUTHERN BOULEVARD**  
**INTERCHANGE PD&E STUDY**  
 FPID: 435516-1-22-02; ETDM No: 14183

- - - - - Existing ROW
- - - - - Existing Limited Access ROW
- - - - - Proposed ROW
- - - - - Proposed Limited Access ROW

- City / Town Limits
- Property Line
- Pavement
- 2nd Level Bridge

- 3rd Level Bridge
- Special Bicycle Lane Treatment
- Sidewalk
- Retaining Wall

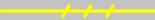
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**ALTERNATIVE 4 -**  
**EB - NB & NB-WB DUAL**  
**3rd-LEVEL FLYOVERS**

SHEET  
 NO.  
**B-7**

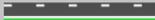
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**SR 9 / I-95 AT SR 80 / SOUTHERN BOULEVARD INTERCHANGE PD&E STUDY**  
 FPID: 435516-1-22-02; ETDM No: 14183

-  Existing ROW
-  Existing Limited Access ROW
-  Proposed ROW
-  Proposed Limited Access ROW

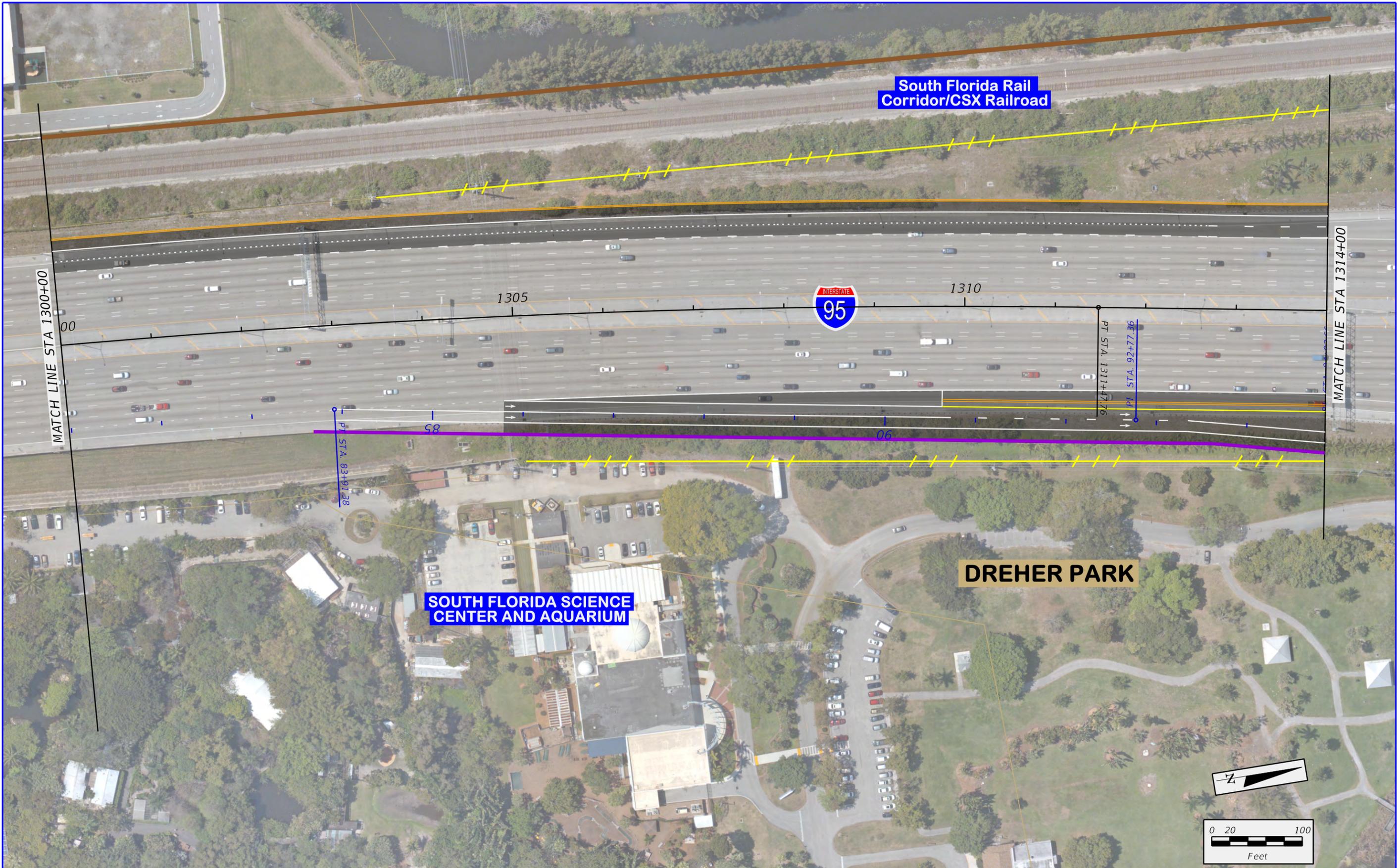
-  City / Town Limits
-  Property Line
-  Pavement
-  2nd Level Bridge

-  3rd Level Bridge
-  Special Bicycle Lane Treatment
-  Sidewalk
-  Retaining Wall

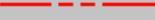
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**ALTERNATIVE 4 -**  
**EB - NB & NB-WB DUAL**  
**3rd-LEVEL FLYOVERS**

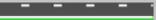
SHEET NO.  
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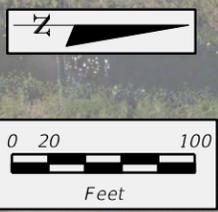
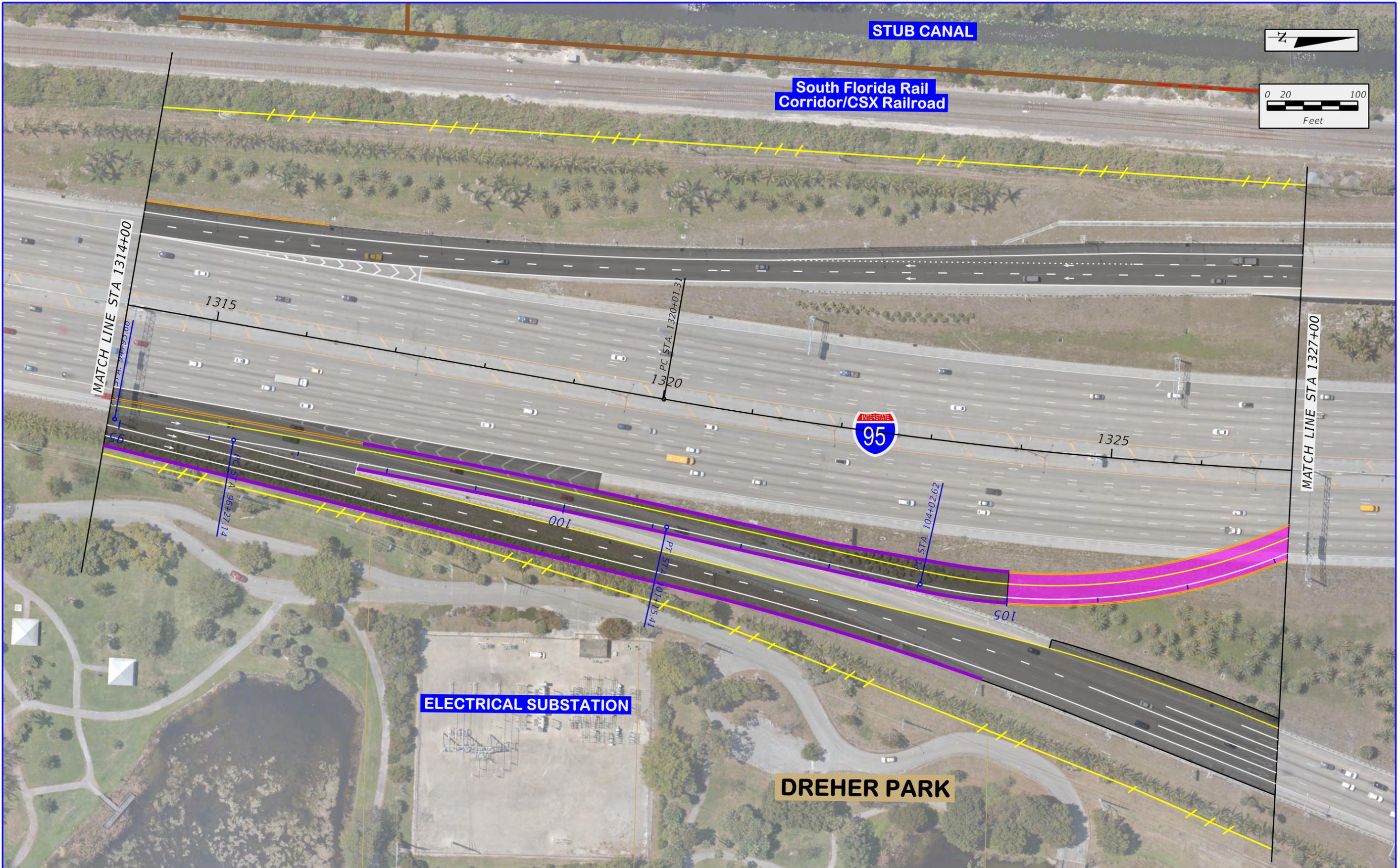
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	Existing Limited Access ROW		Property Line
	Proposed ROW		Pavement
	Proposed Limited Access ROW		2nd Level Bridge

	3rd Level Bridge
	Special Bicycle Lane Treatment
	Sidewalk
	Retaining Wall

**APPENDIX B**  
**ALTERNATIVE 4 -**  
**EB - NB & NB-WB DUAL**  
**3rd-LEVEL FLYOVERS**

SHEET NO.  
**B-9**

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**FDOT**  
 SR 9 / I-95 AT SR 80 / SOUTHERN BOULEVARD  
 INTERCHANGE PD&E STUDY  
 FPID: 435516-1-22-02; ETDM No: 14183

	Existing ROW
	Existing Limited Access ROW
	Proposed ROW
	Proposed Limited Access ROW

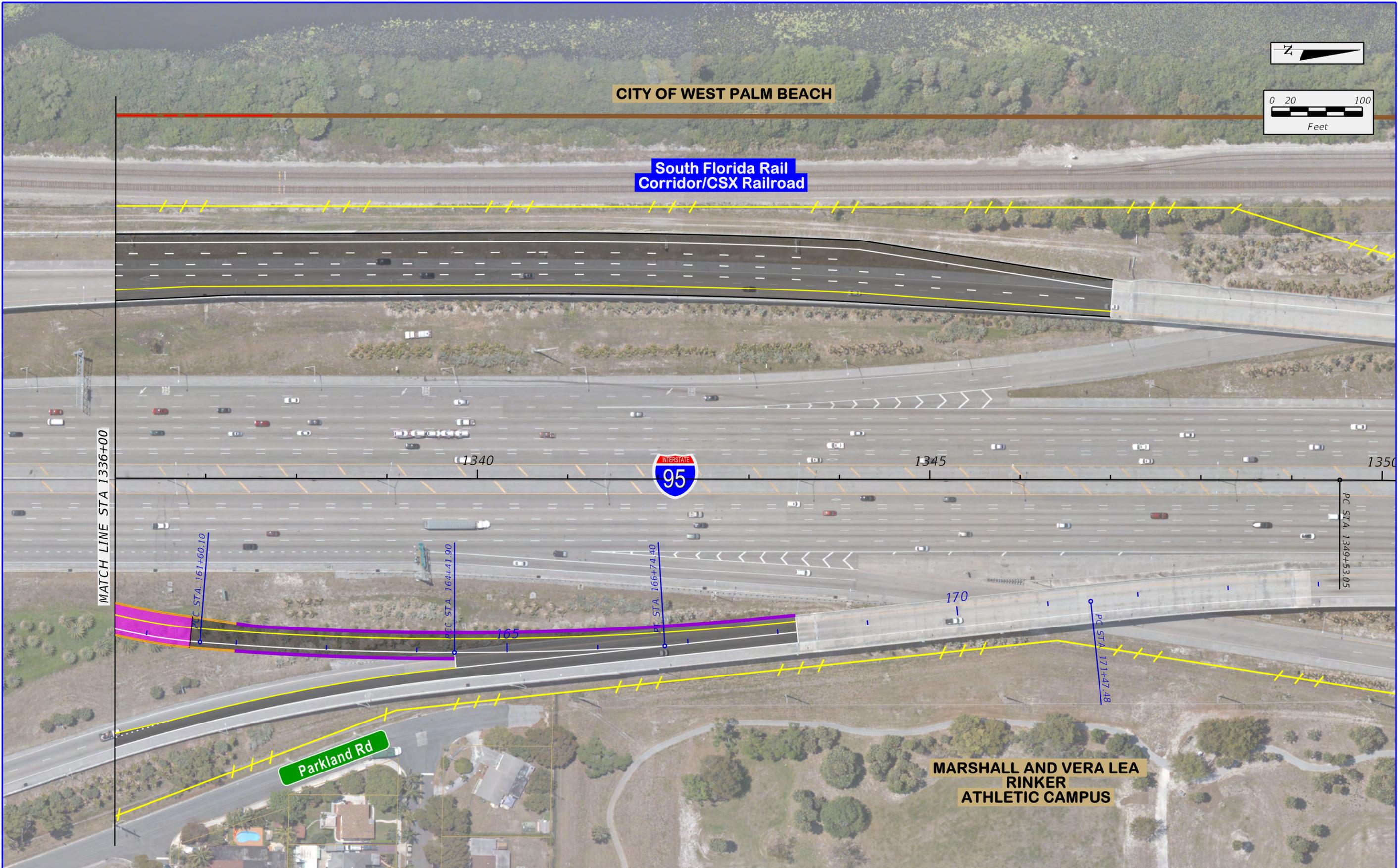
	City / Town Limits
	Property Line
	Pavement
	2nd Level Bridge

	3rd Level Bridge
	Special Bicycle Lane Treatment
	Sidewalk
	Retaining Wall

**APPENDIX B**  
**ALTERNATIVE 4 -**  
**EB - NB & NB-WB DUAL**  
**3rd-LEVEL FLYOVERS**

SHEET  
 NO.  
**B-10**

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CITY OF WEST PALM BEACH

South Florida Rail  
Corridor/CSX Railroad



Parkland Rd

MARSHALL AND VERA LEA  
RINKER  
ATHLETIC CAMPUS



SR 9 / I-95 AT SR 80 / SOUTHERN BOULEVARD  
INTERCHANGE PD&E STUDY  
FPID: 435516-1-22-02; ETDM No: 14183

	Existing ROW		City / Town Limits		3rd Level Bridge
	Existing Limited Access ROW		Property Line		Special Bicycle Lane Treatment
	Proposed ROW		Pavement		Sidewalk
	Proposed Limited Access ROW		2nd Level Bridge		Retaining Wall

APPENDIX B  
ALTERNATIVE 4 -  
EB - NB & NB-WB DUAL  
3rd-LEVEL FLYOVERS

SHEET  
NO.  
B-11



## APPENDIX B

# Noise Modeling Traffic Data



Table 2.3.1: SR 9/I-95 at SR 80/Southern Boulevard - Existing Conditions Traffic Data for Noise Modeling (Sheet 1 of 6)

Roadway/ Roadway Segment	Direction	Number of Lanes	Predicted Peak Hour Demand Volume		Level of Service "C" Volume*	Volume Used In TNM	Cars	Medium Trucks	Heavy Trucks	Speed (Miles per Hour)
			(AM)	(PM)						
Existing Conditions - SR 80/Southern Boulevard										
South Congress Avenue / Australian Avenue Interchange	West of Southbound Australian Avenue Off Ramp to Eastbound SR 80	4	2,849	1,760	3970	2,849	2,749	85	14	45
	Southbound Australian Avenue Off Ramp to Eastbound SR 80	1	27	54	1,220	54	52	2	0	35
	Between Off Ramps to Eastbound SR 80	4	2,876	1,814	3,970	2,876	2,775	86	14	45
	Northbound South Congress Avenue Off Ramp to Eastbound SR 80	1	746	423	1,340	746	720	22	4	45
	Eastbound SR 80 Off Ramp to Australian Avenue / Congress Avenue	1	1,325	463	1,340	1,325	1,279	40	7	45
	Eastbound SR 80 West of Gem Lake Road	4	3,595	2,183	3,970	3,595	3,469	108	18	45
	Westbound SR 80 Off Ramp to Australian Avenue / Congress Avenue	1	618	660	1,340	660	637	20	3	45
	Southbound Australian Avenue Off Ramp Westbound SR 80	1	323	1,063	1,340	1,063	1,026	32	5	45
	Westbound SR 80 Off Ramp to Australian Avenue	1	83	57	1,220	83	80	2	0	35
	Westbound SR 80 West of Gem Lake Drive	4	2,214	3,547	3,970	3,547	3,423	106	18	36
	Westbound SR 80 West of Off Ramp to Congress Avenue	4	1,596	2,887	3,970	2,887	2,786	87	14	45
	Northbound Congress Avenue Off Ramp to Westbound SR 80	1	160	205	1,220	205	198	6	1	35
	Westbound SR 80 West of On Ramp from Congress Avenue	4	1,756	3,092	3,970	3,092	2,984	93	15	45
SR 80 from Gem Lake Drive to West I-95 Ramps	Eastbound	4	3,591	2,208	3,970	3,591	3,465	108	18	45
	Westbound	4	2,190	3,515	3,970	3,515	3,392	105	18	
SR 80 from West I-95 Ramps to East I-95 Ramps	Eastbound	3	2,674	1,767	2,940	2,674	2,580	80	13	45
	Westbound	3	1,658	2,593	2,940	2,593	2,502	78	13	
SR 80 from East I-95 Ramps to Parker Avenue	Eastbound	3	1,663	1,240	1,170	1,170	1,147	20	4	35
	Westbound	3	1,272	1,737	1,170	1,170	1,147	20	4	
SR 80 from Parker Avenue to Lake Avenue	Eastbound	2	1,506	1,059	730	730	715	12	2	35
	Westbound	2	972	1,411	730	730	715	12	2	
SR 80 East of Lake Avenue	Eastbound	2	1,454	961	730	730	715	12	2	35
	Westbound	2	724	1,334	730	730	715	12	2	
Existing Conditions - Parker Avenue										
North of SR 80	Northbound	1	430	358	370	370	363	6	1	30
	Southbound	1	387	527	370	370	363	6	1	
South of SR 80	Northbound	2	587	528	730	587	575	10	2	30
	Southbound	2	401	552	730	552	541	9	2	
Existing Conditions - Lake Avenue										
North of SR 80	Northbound	1	227	234	370	234	229	4	1	30
	Southbound	1	399	336	370	370	363	6	1	
South of SR 80	Northbound	2	242	217	730	242	237	4	1	30
	Southbound	2	218	340	730	340	333	6	1	

Table 2.3.1: SR 9/I-95 at SR 80/Southern Boulevard - Existing Conditions Traffic Data for Noise Modeling (Sheet 2 of 6)

Roadway/ Roadway Segment	Direction	Number of Lanes	Predicted Peak Hour Demand Volume		Level of Service "C" Volume*	Volume Used In TNM	Cars	Medium Trucks	Heavy Trucks	Speed (Miles per Hour)
			(AM)	(PM)						
Existing Conditions - I-95										
I-95 and SR 80 Interchange	I-95 Northbound South of Off Ramp to SR 80 (Includes 1 Auxillary Lane)	7	11,410	8,351	11,320	11,320	10,980	147	192	65
	I-95 Northbound Off Ramp to SR 80	2	1,217	1,541	2,680	1,541	1,495	20	26	30 - 55
	I-95 Northbound between Off Ramp to SR 80 and Off Ramp to Bevedere Road	6	10,193	6,810	10,320	10,193	9,887	133	173	65
	I-95 Northbound On Ramp from SR 80	2	1,842	1,212	2,680	1,842	1,787	24	31	45
	I-95 Northbound Off Ramp to Belvedere Road and PBIA	2	1,543	868	2,680	1,543	1,497	20	26	50
	I-95 Northbound Off Ramp to Belvedere Road	2	1,234	532	2,680	1,234	1,197	16	21	50
	I-95 Northbound Off Ramp to PBIA	1	319	336	1,340	336	326	4	6	50
	I-95 Northbound between Off Ramp to Bevedere Road and On Ramp from SR 80	5	8,650	5,942	7,680	7,680	7,450	100	131	65
	I-95 Northbound North of SR 80 On Ramps	6	10,492	7,154	10,320	10,320	10,010	134	175	65
	I-95 Southbound On Ramp from Bevedere Road	2	779	1,416	2,680	1,416	1,374	18	24	45
	I-95 Southbound Off Ramp to SR 80	2	1,209	1,715	2,680	1,715	1,664	22	29	45
	I-95 Southbound between Off Ramp to SR 80 and On Ramp from Bevedere Road	5	5,518	6,327	7,680	6,327	6,137	82	108	65
	I-95 Southbound between On Ramp from Bevedere and On Ramp from SR 80	5	6,297	7,743	7,680	7,680	7,450	100	131	65
	I-95 Southbound On Ramp from SR 80	2	1,594	1,234	2,680	1,594	1,546	21	27	45 - 60
	I-95 Southbound South of SR 80 On Ramps (Includes 1 Auxillary Lane)	6	7,891	8,977	8,680	8,680	8,420	113	148	65

\* LOS "C" volumes obtained from the generalized tables of FDOT's Level of Service Handbook (December 2012); Ramp LOS "C" volumes approximated based on multilane highways with similar capacities as defined in HCM Exhibit 21-2.

Percentage of Trucks in the Peak Hour:

I-95 - Medium Trucks = 1.3%; Heavy Trucks = 1.7%

SR 80 (Southern Boulevard) & West of I-95 - Medium Trucks = 3.0%; Heavy Trucks = 0.3%; East of I-95 - Medium Trucks = 1.7% and Heavy Trucks 0.3%.

Table 2.3.1: SR 9/I-95 at SR 80/Southern Boulevard - No Build Conditions Traffic Data for Noise Modeling (Sheet 3 of 6)

Roadway/ Roadway Segment	Direction	Number of Lanes	Predicted Peak Hour Demand Volume		Level of Service "C" Volume*	Volume Used In TNM	Cars	Medium Trucks	Heavy Trucks	Speed (Miles per Hour)
			(AM)	(PM)						
Existing Conditions - SR 80/Southern Boulevard										
South Congress Avenue / Australian Avenue Interchange	West of Southbound Australian Avenue Off Ramp to Eastbound SR 80	4	3,504	2,197	3970	3,504	3,381	105	18	45
	Southbound Australian Avenue Off Ramp to Eastbound SR 80	1	33	67	1,220	67	65	2	0	35
	Between Off Ramps to Eastbound SR 80	4	3,537	2,264	3,970	3,537	3,413	106	18	45
	Northbound South Congress Avenue Off Ramp to Eastbound SR 80	1	918	525	1,340	918	886	28	5	45
	Eastbound SR 80 Off Ramp to Australian Avenue / Congress Avenue	1	1,630	577	1,340	1,340	1,293	40	7	45
	Eastbound SR 80 West of Gem Lake Road	4	4,422	2,722	3,970	3,970	3,831	119	20	45
	Westbound SR 80 Off Ramp to Australian Avenue / Congress Avenue	1	752	812	1,340	812	784	24	4	45
	Southbound Australian Avenue Off Ramp Westbound SR 80	1	393	1,308	1,340	1,308	1,262	39	7	45
	Westbound SR 80 Off Ramp to Australian Avenue	1	101	70	1,220	101	97	3	1	35
	Westbound SR 80 West of Gem Lake Drive	4	2,695	4,365	3,970	3,970	3,831	119	20	36
	Westbound SR 80 West of Off Ramp to Congress Avenue	4	1,943	3,553	3,970	3,553	3,429	107	18	45
	Northbound Congress Avenue Off Ramp to Westbound SR 80	1	195	252	1,220	252	243	8	1	35
	Westbound SR 80 West of On Ramp from Congress Avenue	4	2,138	3,805	3,970	3,805	3,672	114	19	45
SR 80 from Gem Lake Drive to West I-95 Ramps	Eastbound	4	4,419	2,744	3,970	3,970	3,831	119	20	45
	Westbound	4	2,672	4,331	3,970	3,970	3,831	119	20	
SR 80 from West I-95 Ramps to East I-95 Ramps	Eastbound	3	3,148	2,037	2,940	2,940	2,837	88	15	45
	Westbound	3	2,206	3,321	2,940	2,940	2,837	88	15	
SR 80 from East I-95 Ramps to Parker Avenue	Eastbound	3	2,099	1,487	1,170	1,170	1,147	20	4	35
	Westbound	3	1,539	2,075	1,170	1,170	1,147	20	4	
SR 80 from Parker Avenue to Lake Avenue	Eastbound	2	1,885	1,264	730	730	715	12	2	35
	Westbound	2	1,138	1,676	730	730	715	12	2	
SR 80 East of Lake Avenue	Eastbound	2	1,742	1,052	730	730	715	12	2	35
	Westbound	2	778	1,472	730	730	715	12	2	
Existing Conditions - Parker Avenue										
North of SR 80	Northbound	1	575	478	370	370	363	6	1	30
	Southbound	1	511	697	370	370	363	6	1	
South of SR 80	Northbound	2	807	726	730	730	715	12	2	30
	Southbound	2	556	769	730	730	715	12	2	
Existing Conditions - Lake Avenue										
North of SR 80	Northbound	1	292	301	370	301	295	5	1	30
	Southbound	1	486	440	370	370	363	6	1	
South of SR 80	Northbound	2	310	302	730	310	304	5	1	30
	Southbound	2	287	449	730	449	440	8	1	

Table 2.3.1: SR 9/I-95 at SR 80/Southern Boulevard - No Build Conditions Traffic Data for Noise Modeling (Sheet 4 of 6)

Roadway/ Roadway Segment	Direction	Number of Lanes	Predicted Peak Hour Demand Volume		Level of Service "C" Volume*	Volume Used In TNM	Cars	Medium Trucks	Heavy Trucks	Speed (Miles per Hour)
			(AM)	(PM)						
Existing Conditions - I-95										
I-95 and SR 80 Interchange	I-95 Northbound South of Off Ramp to SR 80 (Includes 1 Auxillary Lane)	7	12,336	9,873	11,320	11,320	10,980	147	192	65
	I-95 Northbound Off Ramp to SR 80	2	1,796	2,190	2,680	2,190	2,124	28	37	30 - 55
	I-95 Northbound between Off Ramp to SR 80 and Off Ramp to Bevedere Road	6	10,540	7,683	10,320	10,320	10,010	134	175	65
	I-95 Northbound On Ramp from SR 80	2	2,178	1,491	2,680	2,178	2,113	28	37	45
	I-95 Northbound Off Ramp to Bevedere Road and PBIA	2	1,726	1,035	2,680	1,726	1,674	22	29	50
	I-95 Northbound Off Ramp to Bevedere Road	2	1,356	655	2,680	1,356	1,315	18	23	50
	I-95 Northbound Off Ramp to PBIA	1	370	380	1,340	380	369	5	6	50
	I-95 Northbound between Off Ramp to Bevedere Road and On Ramp from SR 80	5	8,814	6,648	7,680	7,680	7,450	100	131	65
	I-95 Northbound North of SR 80 On Ramps	6	10,992	8,139	10,320	10,320	10,010	134	175	65
	I-95 Southbound On Ramp from Bevedere Road	1	834	1,611	2,680	1,611	1,563	21	27	45
	I-95 Southbound Off Ramp to SR 80	2	1,358	2,095	2,680	2,095	2,032	27	36	45
	I-95 Southbound between Off Ramp to SR 80 and On Ramp from Bevedere Road	5	5,751	7,248	7,680	7,248	7,031	94	123	65
	I-95 Southbound between On Ramp from Bevedere and On Ramp from SR 80	5	6,585	8,859	7,680	7,680	7,450	100	131	65
	I-95 Southbound On Ramp from SR 80	2	2,163	1,792	2,680	2,163	2,098	28	37	45 - 60
	I-95 Southbound South of SR 80 On Ramps (Includes 1 Auxillary Lane)	6	8,748	10,651	8,680	8,680	8,420	113	148	65

\* LOS "C" volumes obtained from the generalized tables of FDOT's Level of Service Handbook (December 2012); Ramp LOS "C" volumes approximated based on multilane highways with similar capacities as defined in HCM Exhibit 21-2.

Percentage of Trucks in the Peak Hour:

I-95 - Medium Trucks = 1.3%; Heavy Trucks = 1.7%

SR 80/Southern Boulevard & West of I-95 - Medium Trucks = 3.0%; Heavy Trucks = 0.3%; East of I-95 - Medium Trucks = 1.7% and Heavy Trucks 0.3%.

Table 2.3.1: SR 9/I-95 at SR 80/Southern Boulevard 2040 Build Conditions Traffic Data for Noise Modeling (Sheet 5 of 7)

Roadway/ Roadway Segment	Direction	Number of Lanes	Predicted Peak Hour Demand Volume		Level of Service "C" Volume*	Volume Used In TNM	Cars	Medium Trucks	Heavy Trucks	Speed (Miles per Hour)
			(AM)	(PM)						
Existing Conditions - SR 80/Southern Boulevard										
South Congress Avenue / Australian Avenue Interchange	West of Southbound Australian Avenue Off Ramp to Eastbound SR 80	4	3,504	2,183	3970	3,504	3,381	105	18	45
	Southbound Australian Avenue Off Ramp to Eastbound SR 80	1	33	67	1,220	67	65	2	0	35
	Between Off Ramps to Eastbound SR 80	4	3,537	2,250	3,970	3,537	3,413	106	18	45
	Northbound South Congress Avenue Off Ramp to Eastbound SR 80	1	918	525	1,340	918	886	28	5	45
	Eastbound SR 80 Off Ramp to Australian Avenue / Congress Avenue	1	1,630	574	1,340	1,340	1,293	40	7	45
	Eastbound SR 80 West of Gem Lake Road	4	4,422	2,708	3,970	3,970	3,831	119	20	45
	Westbound SR 80 Off Ramp to Australian Avenue / Congress Avenue	1	752	812	1,340	812	784	24	4	45
	Southbound Australian Avenue Off Ramp Westbound SR 80	1	393	1,308	1,340	1,308	1,262	39	7	45
	Westbound SR 80 Off Ramp to Australian Avenue	1	101	70	1,220	101	97	3	1	35
	Westbound SR 80 West of Gem Lake Drive	4	1,923	3,247	3,970	3,247	3,133	97	16	36
	Westbound SR 80 West of Off Ramp to Congress Avenue	4	1,171	2,435	3,970	2,435	2,350	73	12	45
	Northbound Congress Avenue Off Ramp to Westbound SR 80	1	195	252	1,220	252	243	8	1	35
	Westbound SR 80 West of On Ramp from Congress Avenue	4	1,366	2,687	3,970	2,687	2,593	81	13	45
SR 80 from Gem Lake Drive to West I-95 Ramps	Eastbound	4	3,093	1,928	3,970	3,093	2,985	93	15	45
	Westbound	4	1,900	3,213	3,970	3,213	3,101	96	16	
SR 80 from West I-95 Ramps to East I-95 Ramps	Eastbound	3	1,822	1,221	2,940	1,822	1,758	55	9	45
	Westbound	3	1,434	2,203	2,940	2,203	2,126	66	11	
SR 80 from East I-95 Ramps to Parker Avenue	Eastbound	3	2,099	1,487	1,170	1,170	1,147	20	4	35
	Westbound	3	1,539	2,075	1,170	1,170	1,147	20	4	
SR 80 from Parker Avenue to Lake Avenue	Eastbound	2	1,885	1,264	730	730	715	12	2	35
	Westbound	2	1,138	1,676	730	730	715	12	2	
SR 80 East of Lake Avenue	Eastbound	2	1,742	1,052	730	730	715	12	2	35
	Westbound	2	778	1,472	730	730	715	12	2	
Existing Conditions - Parker Avenue										
North of SR 80	Northbound	1	575	478	370	370	363	6	1	30
	Southbound	1	511	697	370	370	363	6	1	
South of SR 80	Northbound	2	807	726	730	730	715	12	2	30
	Southbound	2	556	769	730	730	715	12	2	
Existing Conditions - Lake Avenue										
North of SR 80	Northbound	1	262	241	370	262	257	4	1	30
	Southbound	1	486	440	370	370	363	6	1	
South of SR 80	Northbound	2	310	302	730	310	304	5	1	30
	Southbound	2	287	449	730	449	440	8	1	

Table 2.3.1: SR 9/I-95 at SR 80/Southern Boulevard 2040 Build Conditions Traffic Data for Noise Modeling (Sheet 6 of 6)

Roadway/ Roadway Segment	Direction	Number of Lanes	Predicted Peak Hour Demand Volume		Level of Service "C" Volume*	Volume Used In TNM	Cars	Medium Trucks	Heavy Trucks	Speed (Miles per Hour)
			(AM)	(PM)						
Existing Conditions - I-95										
I-95 and SR 80 Interchange	I-95 Northbound South of Off Ramp to SR 80 (Includes 1 Auxillary Lane)	7	12,336	9,873	11,320	11,320	10,980	147	192	65
	I-95 Northbound Off Ramp to SR 80	2	1,024	1,072	2,680	1,072	1,040	14	18	30 - 55
	I-95 Northbound Flyover Off Ramp to Westbound SR 80	1	772	1,118	1,340	1,118	1,084	15	19	30 - 55
	I-95 Northbound between Off Ramp to SR 80 and Off Ramp to Bevedere Road	6	10,540	7,683	10,320	10,320	10,010	134	175	65
	I-95 Northbound On Ramp from SR 80	2	3,504	2,307	2,680	2,680	2,600	35	46	45
	Eastbound SR 80 Flyover On Ramp to Northbound I-95 On Ramp	1	1,326	816	1,340	1,326	1,286	17	23	45
	I-95 Northbound Off Ramp to Belvedere Road and PBIA	2	1,726	1,035	2,680	1,726	1,674	22	29	50
	I-95 Northbound Off Ramp to Belvedere Road	2	1,365	655	2,680	1,365	1,324	18	23	50
	I-95 Northbound Off Ramp to PBIA	1	370	380	1,340	380	369	5	6	50
	I-95 Northbound between Off Ramp to Belvedere Road and On Ramp from SR 80	6	8,814	6,648	10,320	8,814	8,550	115	150	65
	I-95 Northbound North of SR 80 On Ramps	6	12,318	8,955	10,320	10,320	10,010	134	175	65
	I-95 Southbound On Ramp from Belvedere Road	1	834	1,611	2,680	1,611	1,563	21	27	45
	I-95 Southbound Off Ramp to SR 80	2	1,358	2,095	2,680	2,095	2,032	27	36	45
	I-95 Southbound between Off Ramp to SR 80 and On Ramp from Belvedere Road	6	5,751	7,248	10,320	7,248	7,031	94	123	65
	I-95 Southbound between On Ramp from Belvedere and On Ramp from SR 80	6	6,585	8,859	10,320	8,859	8,593	115	151	65
	I-95 Southbound On Ramp from SR 80	2	2,163	1,792	2,680	2,163	2,098	28	37	45 - 60
	I-95 Southbound South of SR 80 On Ramps (Includes 1 Auxillary Lane)	6	8,748	10,651	8,680	8,680	8,420	113	148	65

\* LOS "C" volumes obtained from the generalized tables of FDOT's Level of Service Handbook (December 2012); Ramp LOS "C" volumes approximated based on multilane highways with similar capacities as defined in HCM Exhibit 21-2.

Percentage of Trucks in the Peak Hour:

I-95 - Medium Trucks = 1.3%; Heavy Trucks = 1.7%.

SR 80/Southern Boulevard & West of I-95 - Medium Trucks = 3.0%; Heavy Trucks = 0.3%; East of I-95 - Medium Trucks = 1.7% and Heavy Trucks 0.3%.



## APPENDIX C

# Noise Monitoring Data and Traffic Noise Model Validation Results



Table 3.2.1: Noise Monitoring Data and TNM 2.5 Validation Results (Sheet 1 of 7)

General Information		Begin Time	End Time	Travel Lanes	Distance to Nearest Traffic Lane (feet)	Cars		Medium Trucks		Heavy Trucks		Buses		Motorcycles		Monitored Leq (h) dB(A)	TNM Predicted Leq (h) dB(A)	Difference Leq (h) dB(A)	Predicted Levels Within +/- 3 dB(A) of Monitored Levels?
Monitor Site Identification Number	Monitoring Location [Station (STA)]					Vehicles per Hour	Speed (mph)												
Noise Monitoring Sites MS-1 through MS-5 - Monitored on August 26, 2015																			
MS-1	West of I-95 / 1260 Taylor Road (STA 1308+00)	12:10 PM	12:20 PM	I-95 Northbound (North of Off Ramp)	270	3780	66.7	270	63.9	168	62.5	6	65.0	6	68.0	66.8	68.8	2.0	YES
				I-95 Northbound Off Ramp		642	20.0 - 60.0	30	20.0 - 60.0	12	20.0 - 60.0	0	0.0	0	0.0				
				I-95 Northbound (South of Off Ramp)		4422	66.7	300	63.9	180	62.5	6	65.0	6	68.0				
				I-95 Southbound (North of On Ramp)		4,698	69.5	192	64.0	234	65.8	12	63.0	12	70.0				
				I-95 Southbound On Ramp		642	25.0 - 65.0	42	25.0 - 65.0	18	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		5,340	69.5	234	64.0	252	65.8	18	63.0	12	70.0				
		12:20 PM	12:30 PM	I-95 Northbound (North of Off Ramp)		3,858	67.7	180	63.6	282	64.9	30	65.0	6	65.0	66.1	68.6	2.5	YES
				I-95 Northbound Off Ramp		756	20.0 - 60.0	72	20.0 - 60.0	18	20.0 - 60.0	6	20.0 - 60.0	0	0.0				
				I-95 Northbound (South of Off Ramp)		4,614	67.7	252	63.9	300	64.9	36	65.0	6	65.0				
				I-95 Southbound (North of On Ramp)		4,962	68.9	192	66.4	174	63.3	12	65.0	12	67.3				
				I-95 Southbound On Ramp		672	25.0 - 65.0	36	25.0 - 65.0	30	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		5,634	68.9	228	66.4	204	63.3	18	65.0	12	67.3				
		12:30 PM	12:40 PM	I-95 Northbound (North of Off Ramp)		4356	65.8	204	61.4	174	63.8	0	0.0	18	67.2	66.6	68.3	1.7	YES
				I-95 Northbound Off Ramp		534	20.0 - 60.0	24	20.0 - 60.0	36	20.0 - 60.0	6	20.0 - 60.0	0	0.0				
				I-95 Northbound (South of Off Ramp)		4890	65.8	228	61.4	210	63.8	6	65.0	18	67.2				
				I-95 Southbound (North of On Ramp)		4,218	69.6	198	66.0	138	64.6	18	65.0	6	71.0				
				I-95 Southbound On Ramp		636	25.0 - 65.0	54	25.0 - 65.0	30	25.0 - 65.0	12	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		4,854	69.6	252	66.0	168	64.6	30	65.0	6	71.0				
MS-2	West of I-95 / 1330 Churchill Road (STA 1314+00)	12:10 PM	12:20 PM	I-95 Northbound (North of Off Ramp)	360	3780	66.7	270	63.9	168	62.5	6	65.0	6	68.0	66.1	67.5	1.4	YES
				I-95 Northbound Off Ramp		642	20.0 - 60.0	30	20.0 - 60.0	12	20.0 - 60.0	0	0.0	0	0.0				
				I-95 Northbound (South of Off Ramp)		4422	66.7	300	63.9	180	62.5	6	65.0	6	68.0				
				I-95 Southbound (North of On Ramp)		4,698	69.5	192	64.0	234	65.8	12	63.0	12	70.0				
				I-95 Southbound On Ramp		642	25.0 - 65.0	42	25.0 - 65.0	18	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		5,340	69.5	234	64.0	252	65.8	18	63.0	12	70.0				

Table 3.2.1: Noise Monitoring Data and TNM 2.5 Validation Results (Sheet 2 of 7)

General Information		Begin Time	End Time	Travel Lanes	Distance to Nearest Traffic Lane (feet)	Cars		Medium Trucks		Heavy Trucks		Buses		Motorcycles		Monitored Leq (h) dB(A)	TNM Predicted Leq (h) dB(A)	Difference Leq (h) dB(A)	Predicted Levels Within +/- 3 dB(A) of Monitored Levels?				
Monitor Site Identification Number	Monitoring Location [Station (STA)]					Vehicles per Hour	Speed (mph)																
MS-2	West of I-95 / 1330 Churchill Road (STA 1314+00)	12:20 PM	12:30 PM	I-95 Northbound (North of Off Ramp)	360	3,858	67.7	180	63.6	282	64.9	30	65.0	6	65.0	66.2	67.4	1.2	YES				
				I-95 Northbound Off Ramp		756	20.0 - 60.0	72	20.0 - 60.0	18	20.0 - 60.0	6	20.0 - 60.0	0	0.0								
				I-95 Northbound (South of Off Ramp)		4,614	67.7	252	63.9	300	64.9	36	65.0	6	65.0								
				I-95 Southbound (North of On Ramp)		4,962	68.9	192	66.4	174	63.3	12	65.0	12	67.3								
				I-95 Southbound On Ramp		672	25.0 - 65.0	36	25.0 - 65.0	30	25.0 - 65.0	6	25.0 - 65.0	0	0.0								
				I-95 Southbound (South of On Ramp)		5,634	68.9	228	66.4	204	63.3	18	65.0	12	67.3								
		12:30 PM	12:40 PM	I-95 Northbound (North of Off Ramp)		4356	65.8	204	61.4	174	63.8	0	0.0	18	67.2					67.4	67.0	-0.4	YES
				I-95 Northbound Off Ramp		534	20.0 - 60.0	24	20.0 - 60.0	36	20.0 - 60.0	6	20.0 - 60.0	0	0.0								
				I-95 Northbound (South of Off Ramp)		4890	65.8	228	61.4	210	63.8	6	65.0	18	67.2								
				I-95 Southbound (North of On Ramp)		4,218	69.6	198	66.0	138	64.6	18	65.0	6	71.0								
				I-95 Southbound On Ramp		636	25.0 - 65.0	54	25.0 - 65.0	30	25.0 - 65.0	12	25.0 - 65.0	0	0.0								
				I-95 Southbound (South of On Ramp)		4,854	69.6	252	66.0	168	64.6	30	65.0	6	71.0								
MS-3	West of I-95 / 112 East Chandler Road (STA 1319+00)	12:10 PM	12:20 PM	I-95 Northbound (North of Off Ramp)	555	3780	66.7	270	63.9	168	62.5	6	65.0	6	68.0	63.8	63.4	-0.4	YES				
				I-95 Northbound Off Ramp		642	20.0 - 60.0	30	20.0 - 60.0	12	20.0 - 60.0	0	0.0	0	0.0								
				I-95 Northbound (South of Off Ramp)		4422	66.7	300	63.9	180	62.5	6	65.0	6	68.0								
				I-95 Southbound (North of On Ramp)		4,698	69.5	192	64.0	234	65.8	12	63.0	12	70.0								
				I-95 Southbound On Ramp		642	25.0 - 65.0	42	25.0 - 65.0	18	25.0 - 65.0	6	25.0 - 65.0	0	0.0								
				I-95 Southbound (South of On Ramp)		5,340	69.5	234	64.0	252	65.8	18	63.0	12	70.0								
		12:20 PM	12:30 PM	I-95 Northbound (North of Off Ramp)		3,858	67.7	180	63.6	282	64.9	30	65.0	6	65.0					64.9	63.4	-1.5	YES
				I-95 Northbound Off Ramp		756	20.0 - 60.0	72	20.0 - 60.0	18	20.0 - 60.0	6	20.0 - 60.0	0	0.0								
				I-95 Northbound (South of Off Ramp)		4,614	67.7	252	63.9	300	64.9	36	65.0	6	65.0								
				I-95 Southbound (North of On Ramp)		4,962	68.9	192	66.4	174	63.3	12	65.0	12	67.3								
				I-95 Southbound On Ramp		672	25.0 - 65.0	36	25.0 - 65.0	30	25.0 - 65.0	6	25.0 - 65.0	0	0.0								
				I-95 Southbound (South of On Ramp)		5,634	68.9	228	66.4	204	63.3	18	65.0	12	67.3								

Table 3.2.1: Noise Monitoring Data and TNM 2.5 Validation Results (Sheet 3 of 7)

General Information		Begin Time	End Time	Travel Lanes	Distance to Nearest Traffic Lane (feet)	Cars		Medium Trucks		Heavy Trucks		Buses		Motorcycles		Monitored Leq (h) dB(A)	TNM Predicted Leq (h) dB(A)	Difference Leq (h) dB(A)	Predicted Levels Within +/- 3 dB(A) of Monitored Levels?
Monitor Site Identification Number	Monitoring Location [Station (STA)]					Vehicles per Hour	Speed (mph)	Vehicles per Hour	Speed (mph)	Vehicles per Hour	Speed (mph)	Vehicles per Hour	Speed (mph)	Vehicles per Hour	Speed (mph)				
MS-4	East of I-95 / Palm Beach Zoo (STA 1302+00)	9:45 AM	9:55 AM	Ambient Noise Reading	140	No Traffic Data for This Time Frame										65.1	---	---	---
		9:55 AM	10:05 AM	I-95 Northbound (North of Off Ramp)		4272	66.9	180	57.0	162	61.4	6	65.0	6	56.0	64.1	63.6	-0.5	YES
				I-95 Northbound Off Ramp		630	20.0 - 50.0	30	20.0 - 50.0	24	20.0 - 50.0	0	0.0	6	0.0				
				I-95 Northbound (South of Off Ramp)		4902	66.9	210	57.0	186	61.4	6	65.0	12	56.0				
				I-95 Southbound (North of On Ramp)		4,110	70.1	210	69.9	198	67.3	0	0.0	0	0.0				
				I-95 Southbound On Ramp		714	25.0 - 65.0	72	25.0 - 65.0	6	25.0 - 65.0	0	0.0	0	0.0				
				I-95 Southbound (South of On Ramp)		4,824	70.1	282	69.9	204	67.3	0	0.0	0	0.0				
		10:05 AM	10:15 AM	I-95 Northbound (North of Off Ramp)		4,260	66.2	192	56.3	222	59.1	12	65.0	18	69.0	63.6	63.9	0.3	YES
				I-95 Northbound Off Ramp		588	20.0 - 50.0	30	20.0 - 50.0	30	20.0 - 50.0	0	0.0	6	20.0 - 50.0				
				I-95 Northbound (South of Off Ramp)		4,848	66.2	222	56.3	252	59.1	12	65.0	24	69.0				
				I-95 Southbound (North of On Ramp)		4,134	70.2	228	68.1	258	67.9	0	0.0	0	0.0				
				I-95 Southbound On Ramp		636	25.0 - 65.0	54	25.0 - 65.0	24	25.0 - 65.0	0	0.0	0	0.0				
				I-95 Southbound (South of On Ramp)		4,770	70.2	282	68.1	282	67.9	0	0.0	0	0.0				
		10:15 AM	10:25 AM	I-95 Northbound (North of Off Ramp)		4146	66.7	192	60.8	216	62.4	6	65.0	18	65.3	63.9	64.1	0.2	YES
				I-95 Northbound Off Ramp		558	20.0 - 50.0	72	20.0 - 50.0	24	20.0 - 50.0	0	0.0	0	0.0				
				I-95 Northbound (South of Off Ramp)		4704	66.7	264	60.8	240	62.4	6	65.0	18	65.3				
				I-95 Southbound (North of On Ramp)		4,320	71.1	240	68.8	258	67.7	0	0.0	6	72.0				
				I-95 Southbound On Ramp		756	25.0 - 65.0	102	25.0 - 65.0	30	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		5,076	71.1	342	68.8	288	67.7	6	0.0	6	72.0				
		10:25 AM	10:35 AM	I-95 Northbound (North of Off Ramp)		4590	65.8	240	64.2	288	61.0	24	65.0	0	0.0	64.8	64.3	-0.5	YES
				I-95 Northbound Off Ramp		522	20.0 - 50.0	36	20.0 - 50.0	24	20.0 - 50.0	6	20.0 - 50.0	0	0.0				
				I-95 Northbound (South of Off Ramp)		5112	65.8	276	64.2	312	61.0	30	65.0	0	0.0				
				I-95 Southbound (North of On Ramp)		4,356	69.1	240	67.3	240	67.1	6	69.0	18	69.0				
				I-95 Southbound On Ramp		684	25.0 - 65.0	42	25.0 - 65.0	12	25.0 - 65.0	12	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		5,040	69.1	282	67.3	252	67.1	18	69.0	18	69.0				
		10:35 AM	10:45 AM	Ambient Noise Reading		No Traffic Data for This Time Frame										64.1	---	---	---
10:45 AM	10:55 AM	Ambient Noise Reading	No Traffic Data for This Time Frame										63.7	---	---	---			

Table 3.2.1: Noise Monitoring Data and TNM 2.5 Validation Results (Sheet 4 of 7)

General Information		Begin Time	End Time	Travel Lanes	Distance to Nearest Traffic Lane (feet)	Cars		Medium Trucks		Heavy Trucks		Buses		Motorcycles		Monitored Leq (h) dB(A)	TNM Predicted Leq (h) dB(A)	Difference Leq (h) dB(A)	Predicted Levels Within +/- 3 dB(A) of Monitored Levels?
Monitor Site Identification Number	Monitoring Location [Station (STA)]					Vehicles per Hour	Speed (mph)												
MS-5	East of I-95 /Dreher Park North (STA 1314+00)	9:55 AM	10:05 AM	I-95 Northbound (North of Off Ramp)	130	4272	66.9	180	57.0	162	61.4	6	65.0	6	56.0	70.3	72.9	2.6	YES
				I-95 Northbound Off Ramp		630	20.0 - 50.0	30	20.0 - 50.0	24	20.0 - 50.0	0	0.0	6	0.0				
				I-95 Northbound (South of Off Ramp)		4902	66.9	210	57.0	186	61.4	6	65.0	12	56.0				
				I-95 Southbound (North of On Ramp)		4,110	70.1	210	69.9	198	67.3	0	0.0	0	0.0				
				I-95 Southbound On Ramp		714	25.0 - 65.0	72	25.0 - 65.0	6	25.0 - 65.0	0	0.0	0	0.0				
				I-95 Southbound (South of On Ramp)		4,824	70.1	282	69.9	204	67.3	0	0.0	0	0.0				
		10:05 AM	10:15 AM	I-95 Northbound (North of Off Ramp)		4,260	66.2	192	56.3	222	59.1	12	65.0	18	69.0	70.3	73.2	2.9	YES
				I-95 Northbound Off Ramp		588	20.0 - 50.0	30	20.0 - 50.0	30	20.0 - 50.0	0	0.0	6	20.0 - 50.0				
				I-95 Northbound (South of Off Ramp)		4,848	66.2	222	56.3	252	59.1	12	65.0	24	69.0				
				I-95 Southbound (North of On Ramp)		4,134	70.2	228	68.1	258	67.9	0	0.0	0	0.0				
				I-95 Southbound On Ramp		636	25.0 - 65.0	54	25.0 - 65.0	24	25.0 - 65.0	0	0.0	0	0.0				
				I-95 Southbound (South of On Ramp)		4,770	70.2	282	68.1	282	67.9	0	0.0	0	0.0				
		10:25 AM	10:35 AM	I-95 Northbound (North of Off Ramp)		4590	65.8	240	64.2	288	61.0	24	65.0	0	0.0	70.6	73.6	3.0	YES
				I-95 Northbound Off Ramp		522	20.0 - 50.0	36	20.0 - 50.0	24	20.0 - 50.0	6	20.0 - 50.0	0	0.0				
				I-95 Northbound (South of Off Ramp)		5112	65.8	276	64.2	312	61.0	30	65.0	0	0.0				
				I-95 Southbound (North of On Ramp)		4,356	69.1	240	67.3	240	67.1	6	69.0	18	69.0				
				I-95 Southbound On Ramp		684	25.0 - 65.0	42	25.0 - 65.0	12	25.0 - 65.0	12	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		5,040	69.1	282	67.3	252	67.1	18	69.0	18	69.0				
Noise Monitoring Sites MS-6 through MS-9 - Monitored on September 12, 2016																			
MS-6	East of I-95 / 1137 Oak Street (STA 1338+00)	4:35 pm	4:45 pm	I-95 Northbound (South of Off Ramp)	135	5,958	69.2	138	65.0	192	63.7	18	63.7	6	58.0	62.2	62.4	0.2	YES
				I-95 Northbound Off Ramp		846	20.0 - 60.0	30	20.0 - 60.0	0	0	6	20.0 - 60.0	6	20.0 - 60.0				
				I-95 Northbound (Between Ramps)		5,112	69.2	108	65.0	192	63.7	12	63.7	0	0.0				
				I-95 Northbound On Ramp		1,332	25.0 - 65.0	36	25.0 - 65.0	36	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		7,320	69.2	162	67.5	84	63.1	18	55.5	6	70.0				
				I-95 Southbound On Ramp		1,110	25.0 - 65.0	12	25.0 - 65.0	12	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
				I-95 Southbound (Between Ramps)		6,210	69.2	150	67.5	72	63.1	12	55.5	6	70.0				
				I-95 Southbound Off Ramp		1,476	25.0 - 65.0	18	25.0 - 65.0	18	25.0 - 65.0	6	25.0 - 65.0	0	0.0				

Table 3.2.1: Noise Monitoring Data and TNM 2.5 Validation Results (Sheet 5 of 7)

General Information		Begin Time	End Time	Travel Lanes	Distance to Nearest Traffic Lane (feet)	Cars		Medium Trucks		Heavy Trucks		Buses		Motorcycles		Monitored Leq (h) dB(A)	TNM Predicted Leq (h) dB(A)	Difference Leq (h) dB(A)	Predicted Levels Within +/- 3 dB(A) of Monitored Levels?
Monitor Site Identification Number	Monitoring Location [Station (STA)]					Vehicles per Hour	Speed (mph)												
MS-6	East of I-95 / 1137 Oak Street (STA 1338+00)	4:45 pm	4:55 pm	I-95 Northbound (South of Off Ramp)	135	6,528	68.6	114	63.3	168	65.4	12	64.0	0	0.0	62.0	62.0	0.0	YES
				I-95 Northbound Off Ramp		732	20.0 - 60.0	30	20.0 - 60.0	6	20.0 - 60.0	0	20.0 - 60.0	0	20.0 - 60.0				
				I-95 Northbound (Between Ramps)		5,796	68.6	84	63.3	162	65.4	12	64.0	0	0.0				
				I-95 Northbound On Ramp		1,020	25.0 - 65.0	30	25.0 - 65.0	18	25.0 - 65.0	12	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		8,316	69.6	132	66.6	72	66.4	6	59.8	12	76.0				
				I-95 Southbound On Ramp		1,068	25.0 - 65.0	24	25.0 - 65.0	0	0.0	6	25.0 - 65.0	6	25.0 - 65.0				
				I-95 Southbound (Between Ramps)		7,248	69.6	108	66.6	72	66.4	0	0.0	6	76.0				
				I-95 Southbound Off Ramp		1,566	25.0 - 65.0	18	25.0 - 65.0	0	0.0	0	0.0	0	0.0				
		4:55 pm	5:05 pm	I-95 Northbound (South of Off Ramp)	135	5,358	68.4	144	63.7	132	64.2	18	64.3	0	0.0	62.4	61.4	-1.0	YES
				I-95 Northbound Off Ramp		702	20.0 - 60.0	30	20.0 - 60.0	6	20.0 - 60.0	0	0.0	0	0.0				
				I-95 Northbound (Between Ramps)		4,656	68.4	114	63.7	126	64.2	18	64.3	0	0.0				
				I-95 Northbound On Ramp		858	25.0 - 65.0	42	25.0 - 65.0	12	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		7,644	69.2	132	64.8	90	64.4	24	68.5	12	70.0				
				I-95 Southbound On Ramp		1,272	25.0 - 65.0	12	25.0 - 65.0	0	0.0	0	0.0	0	0.0				
				I-95 Southbound (Between Ramps)		6,372	69.2	120	64.8	90	64.4	24	68.5	12	70.0				
				I-95 Southbound Off Ramp		1,308	25.0 - 65.0	42	25.0 - 65.0	24	25.0 - 65.0	12	25.0 - 65.0	6	25.0 - 65.0				
		5:05 pm	5:15 pm	I-95 Northbound (South of Off Ramp)	135	5,736	69.6	84	65.4	204	66.6	12	66.3	0	0.0	62.4	62.1	-0.3	YES
				I-95 Northbound Off Ramp		858	20.0 - 60.0	12	20.0 - 60.0	0	0.0	0	0.0	0	0.0				
				I-95 Northbound (Between Ramps)		4,878	69.6	72	65.4	204	66.6	12	66.3	0	0.0				
				I-95 Northbound On Ramp		1,074	25.0 - 65.0	36	25.0 - 65.0	18	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		8,892	68.7	138	66.2	84	67.1	12	62.3	6	73.5				
				I-95 Southbound On Ramp		1,662	25.0 - 65.0	24	25.0 - 65.0	12	25.0 - 65.0	0	0.0	0	0.0				
				I-95 Southbound (Between Ramps)		7,230	68.7	114	66.2	72	67.1	12	62.3	6	73.5				
				I-95 Southbound Off Ramp		1,494	25.0 - 65.0	30	25.0 - 65.0	12	25.0 - 65.0	12	25.0 - 65.0	0	0.0				

Table 3.2.1: Noise Monitoring Data and TNM 2.5 Validation Results (Sheet 6 of 7)

General Information		Begin Time	End Time	Travel Lanes	Distance to Nearest Traffic Lane (feet)	Cars		Medium Trucks		Heavy Trucks		Buses		Motorcycles		Monitored Leq (h) dB(A)	TNM Predicted Leq (h) dB(A)	Difference Leq (h) dB(A)	Predicted Levels Within +/- 3 dB(A) of Monitored Levels?
Monitor Site Identification Number	Monitoring Location [Station (STA)]					Vehicles per Hour	Speed (mph)												
MS-7	East of I-95 / 1133 Oak Street (STA 1338+00)	4:35 pm	4:45 pm	I-95 Northbound (South of Off Ramp)	190	5,958	69.2	138	65.0	192	63.7	18	63.7	6	58.0	63.5	61.3	-2.2	YES
				I-95 Northbound Off Ramp		846	20.0 - 60.0	30	20.0 - 60.0	0	0.0	6	20.0 - 60.0	6	20.0 - 60.0				
				I-95 Northbound (Between Ramps)		5,112	69.2	108	65.0	192	63.7	12	63.7	0	0.0				
				I-95 Northbound On Ramp		1,332	25.0 - 65.0	36	25.0 - 65.0	36	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		7,320	69.2	162	67.5	84	63.1	18	55.5	6	70.0				
				I-95 Southbound On Ramp		1,110	25.0 - 65.0	12	25.0 - 65.0	12	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
				I-95 Southbound (Between Ramps)		6,210	69.2	150	67.5	72	63.1	12	55.5	6	70.0				
				I-95 Southbound Off Ramp		1,476	25.0 - 65.0	18	25.0 - 65.0	18	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
		4:45 pm	4:55 pm	I-95 Northbound (South of Off Ramp)	190	6,528	68.6	114	63.3	168	65.4	12	64.0	0	0.0	62.9	61.0	-1.9	YES
				I-95 Northbound Off Ramp		732	20.0 - 60.0	30	20.0 - 60.0	6	20.0 - 60.0	0	0.0	0	0.0				
				I-95 Northbound (Between Ramps)		5,796	68.6	84	63.3	162	65.4	12	64.0	0	0.0				
				I-95 Northbound On Ramp		1,020	25.0 - 65.0	30	25.0 - 65.0	18	25.0 - 65.0	12	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		8,316	69.6	132	66.6	72	66.4	6	59.8	12	76.0				
				I-95 Southbound On Ramp		1,068	25.0 - 65.0	24	25.0 - 65.0	0	0.0	6	25.0 - 65.0	6	25.0 - 65.0				
				I-95 Southbound (Between Ramps)		7,248	69.6	108	66.6	72	66.4	0	0.0	6	76.0				
				I-95 Southbound Off Ramp		1,566	25.0 - 65.0	18	25.0 - 65.0	0	0.0	0	0.0	0	0.0				
		4:55 pm	5:05 pm	I-95 Northbound (South of Off Ramp)	190	5,358	68.4	144	63.7	132	64.2	18	64.3	0	0.0	63.2	60.4	-2.8	YES
				I-95 Northbound Off Ramp		702	20.0 - 60.0	30	20.0 - 60.0	6	20.0 - 60.0	0	0.0	0	0.0				
				I-95 Northbound (Between Ramps)		4,656	68.4	114	63.7	126	64.2	18	64.3	0	0.0				
				I-95 Northbound On Ramp		858	25.0 - 65.0	42	25.0 - 65.0	12	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		7644	69.2	132	64.8	90	64.4	24	68.5	12	70.0				
				I-95 Southbound On Ramp		1,272	25.0 - 65.0	12	25.0 - 65.0	0	0.0	0	0.0	0	0.0				
				I-95 Southbound (Between Ramps)		6,372	69.2	120	64.8	90	64.4	24	68.5	12	70.0				
				I-95 Southbound Off Ramp		1308	25.0 - 65.0	42	25.0 - 65.0	24	25.0 - 65.0	12	25.0 - 65.0	6	25.0 - 65.0				

Table 3.2.1: Noise Monitoring Data and TNM 2.5 Validation Results (Sheet 7 of 7)

General Information		Begin Time	End Time	Travel Lanes	Distance to Nearest Traffic Lane (feet)	Cars		Medium Trucks		Heavy Trucks		Buses		Motorcycles		Monitored Leq (h) dB(A)	TNM Predicted Leq (h) dB(A)	Difference Leq (h) dB(A)	Predicted Levels Within +/- 3 dB(A) of Monitored Levels?
Monitor Site Identification Number	Monitoring Location [Station (STA)]					Vehicles per Hour	Speed (mph)												
MS-7	East of I-95 / 1133 Oak Street (STA 1338+00)	5:05 pm	5:15 pm	I-95 Northbound (South of Off Ramp)	190	5,736	69.6	84	65.4	204	66.6	12	66.3	0	0.0	63.4	61.0	-2.4	YES
				I-95 Northbound Off Ramp		858	20.0 - 60.0	12	20.0 - 60.0	0	0.0	0	0.0	0	0.0				
				I-95 Northbound (Between Ramps)		4,878	69.6	72	65.4	204	66.6	12	66.3	0	0.0				
				I-95 Northbound On Ramp		1,074	25.0 - 65.0	36	25.0 - 65.0	18	25.0 - 65.0	6	25.0 - 65.0	0	0.0				
				I-95 Southbound (South of On Ramp)		8,892	68.7	138	66.2	84	67.1	12	62.3	6	73.5				
				I-95 Southbound On Ramp		1,662	25.0 - 65.0	24	25.0 - 65.0	12	25.0 - 65.0	0	0.0	0	0.0				
				I-95 Southbound (Between Ramps)		7,230	68.7	114	66.2	72	67.1	12	62.3	6	73.5				
				I-95 Southbound Off Ramp		1,494	25.0 - 65.0	30	25.0 - 65.0	12	25.0 - 65.0	12	25.0 - 65.0	0	0.0				
MS-8	North of SR 80/ Southern Boulevard / 1002 Paseo Alacala (STA 3236+00)	1:15 pm	1:25 pm	Westbound on Southern Boulevard	45	810	40.5	42	36.3	42	32.7	0	0.0	0	0.0	68.0	66.9	-1.1	YES
				Eastbound on Southern Boulevard		756	39.7	12	36.4	12	41.0	12	35.0	0	0.0				
		1:25 pm	1:35 pm	Westbound on Southern Boulevard		972	40.4	30	38.3	6	34.3	12	37.5	0	0.0	68.0	66.5	-1.5	YES
				Eastbound on Southern Boulevard		738	41.0	36	38.3	6	35.5	6	42.0	6	41.0				
		1:35 pm	1:45 pm	Westbound on Southern Boulevard		846	42.3	30	34.5	0	0.0	0	0.0	0	0.0	68.8	66.2	-2.6	YES
				Eastbound on Southern Boulevard		834	39.3	42	36.1	6	33.0	6	29.0	6	43.0				
MS-9	North of SR 80/ Southern Boulevard / 1001 Paseo Alacala (STA 3236+00)	1:15 pm	1:25 pm	Westbound on Southern Boulevard	220	810	40.5	42	36.3	42	32.7	0	0.0	0	0.0	57.1	59.0	1.9	YES
				Eastbound on Southern Boulevard		756	39.7	12	36.4	12	41.0	12	35.0	0	0.0				
		1:25 pm	1:35 pm	Westbound on Southern Boulevard		972	40.4	30	38.3	6	34.3	12	37.5	0	0.0	56.5	58.5	2.0	YES
				Eastbound on Southern Boulevard		738	41.0	36	38.3	6	35.5	6	42.0	6	41.0				
		1:35 pm	1:45 pm	Westbound on Southern Boulevard		846	42.3	30	34.5	0	0.0	0	0.0	0	0.0	61.0	58.3	-2.7	YES
				Eastbound on Southern Boulevard		834	39.3	42	36.1	6	33.0	6	29.0	6	43.0				

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Average Difference Between TNM 2.5 Predicted Levels and Monitored Levels for Validated Sites [Within +/- 3 dB(A)]	1.5
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