



PROJECT DEVELOPMENT & ENVIRONMENT (PD&E) STUDY

Interstate 95 (I-95/SR 9) • From South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, FL • FPID No.: 436903-I-22-02 • ETDM No.: 14254

NOISE STUDY REPORT

DRAFT

JULY 2021



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Interstate 95 (I-95) / State Road 9 (SR 9) Project Development and Environment Study

Project Study Limits:

From South of Hallandale Beach Boulevard (SR 858) to
North of Hollywood Boulevard (SR 820)
Mileposts 0.0 – 3.1

Efficient Transportation and Decision Making (ETDM) Number: 14254
Financial Project Identification Number (FPID): 436903-1-22-02

Broward County, Florida

Prepared for:



FDOT District Four
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309

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The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. §327 and a Memorandum of Understanding dated December 14, 2016 and executed by the Federal Highway Administration and FDOT.

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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 for Interstate 95 (I-95) from south of Hallandale Beach Boulevard (SR 858) to north of Hollywood Boulevard (SR 820), a distance of approximately three miles (see **Figure 1.1**). The PD&E Study includes improvements to the Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard interchanges. The project is located in Broward County, Florida and is contained within the municipalities of Hallandale Beach, Pembroke Park, and Hollywood.

As part of this PD&E Study, a traffic noise study was performed. 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 Build Alternative, approach, meet, or exceed the Noise Abatement Criteria (NAC) set forth by the FDOT and the Federal Highway Administration (FHWA) or where a substantial increase in traffic noise occurs.

Secondary objectives of this study included the consideration of construction-related noise and vibration impacts as well as the development of noise level contours, that 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 (NSR) is to present the findings of the traffic noise analysis. This report also provides technical documentation for the findings described in the project's Preliminary Engineering Report (PER) and Type 2 Categorical Exclusion Environmental Determination Form.

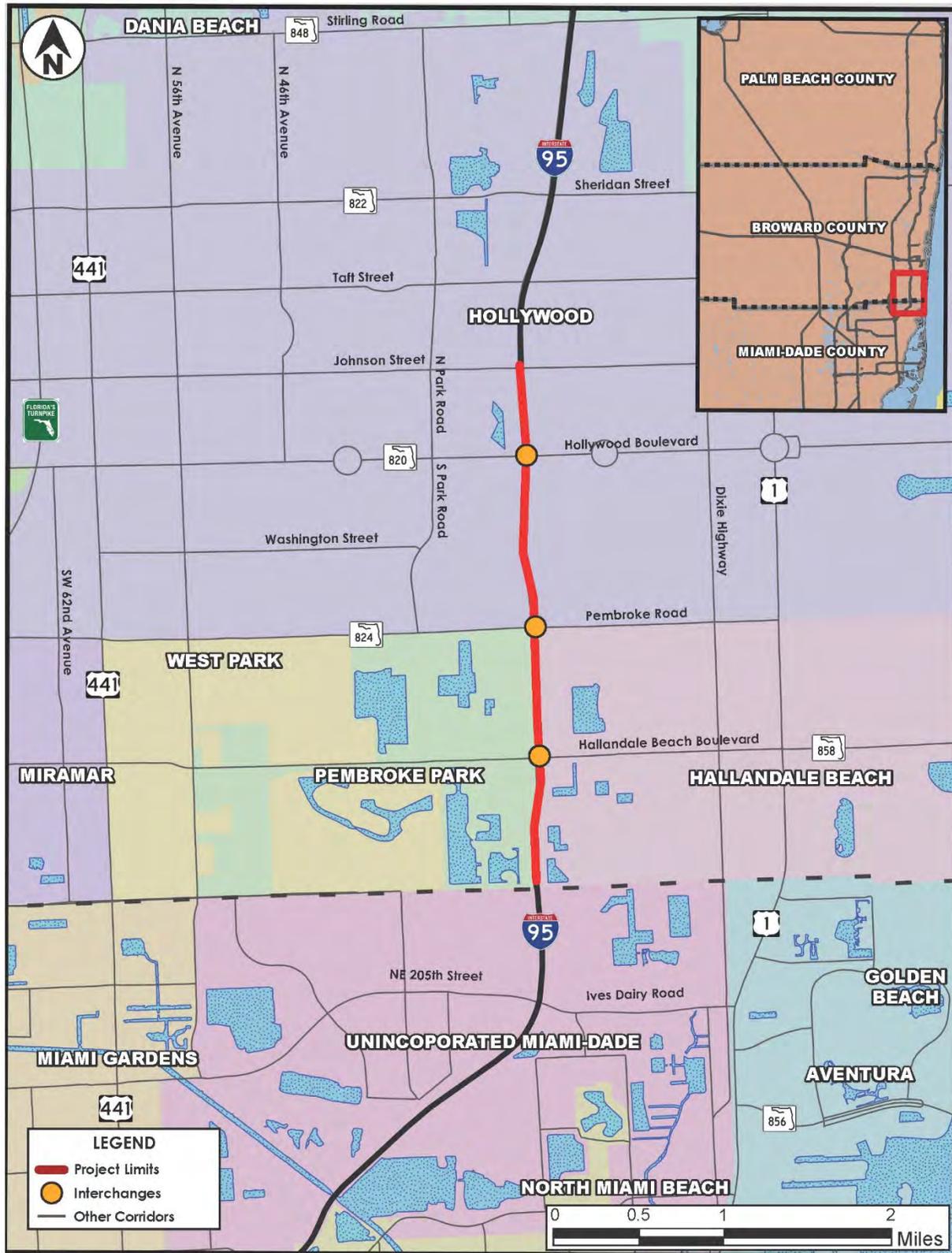


Figure 1.1 – Project Location Map



1.1 PROJECT DESCRIPTION

I-95 is the primary north-south interstate facility that links all major cities along the Atlantic Seaboard and is one of the most important transportation systems in southeast Florida. I-95 is one of the two major expressways, Florida's Turnpike being the other, that connects major employment centers and residential areas within the South Florida tri-county area. I-95 is part of the State's Strategic Intermodal System (SIS) and the National Highway System. In addition, I-95 is designated as an evacuation route along the east coast of Florida.

I-95, within the project limits, currently consists of eight general use lanes (four in each direction) and four dynamically tolled express lanes (two in each direction). This segment of I-95 is functionally classified as a Divided Urban Principal Arterial Interstate and has a posted speed limit of 65 miles per hour. The access management classification for this corridor is Class 1.2, Freeway in an existing urbanized area with limited access.

There are three existing full interchanges within the project limits located at Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard. All three roadways are classified as Divided Urban Principal Arterials. Hallandale Beach Boulevard consists of four lanes west of I-95 and six lanes east of I-95. Pembroke Road and Hollywood Boulevard each have six lanes west of I-95 and four lanes east of I-95.

This project is evaluating the potential modification of existing entrance and exit ramps serving the three interchanges within the project limits. Widening and turn lane modifications will be evaluated along Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard to facilitate the ramp modifications and improve the access and operation of the corridors upstream and downstream from the interchanges.

1.1.1 PURPOSE AND NEED OF THE PROJECT

The overall goals and objectives of this PD&E Study are described below:

- Evaluate the implementation of potential interchange, arterial corridor and intersection improvements that will improve capacity, operations, safety, mobility, and emergency evacuation;
- Identify the appropriate interstate/interchange access improvements that, combined with Transportation Systems Management and Operations



(TSM&O) improvements, will service the users of the area and achieve the Purpose and Need;

- Provide relief from existing and projected traffic congestion;
- Improve the safety of the I-95 mainline corridor by addressing speed differentials and lane weaving deficiencies between interchanges;
- Support the optimal operations of the existing roadway network;
- Reinforce desired land use by controlling access along the arterial corridors;
- Maintain consistency with the current I-95 Express Lanes and local projects; and
- Prioritize the proposed improvements based on the area needs (short-term vs. long-term), logical segmentation and funding.

The need for this project is to increase interchange capacity and adjacent arterial intersections capacity along Hallandale Beach Boulevard, Pembroke Road and Hollywood Boulevard. Other considerations for the purpose and need of this project include safety, system linkage, modal interrelationships, transportation demand, social demands, economic development, and emergency evacuation. The primary and secondary needs for the project are discussed in further detail below.

Capacity – The I-95 ramps at Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard are currently congested and affecting traffic operations along I-95 between the interchange ramps and at the arterial intersections near I-95. Without future improvements, the driving conditions will continue to deteriorate well below acceptable Level of Service (LOS) standards. The following I-95 freeway segments will operate below LOS D within at least one peak-hour period before the year 2045:

- Ives Dairy Road northbound on-ramp to Hallandale Beach Boulevard northbound off-ramp;
- Hallandale Beach Boulevard northbound on-ramp to Pembroke Road northbound off-ramp;
- Pembroke Road northbound on-ramp to Hollywood Boulevard northbound off-ramp;
- Hollywood Boulevard northbound on-ramp to Sheridan Street northbound off-ramp;
- Sheridan Street southbound on-ramp to Hollywood Boulevard southbound off-ramp;



- Pembroke Road southbound on-ramp to Hallandale Beach Boulevard southbound off-ramp; and
- Hallandale Beach Boulevard southbound on-ramp to Ives Dairy Road southbound off-ramp.

Additionally, the following intersections will fall below LOS D during at least one peak-hour period before the year 2045:

- Hallandale Beach Boulevard northbound ramp terminal;
- Hallandale Beach Boulevard southbound ramp terminal;
- Hollywood Boulevard southbound ramp terminal; and
- Hollywood Boulevard/28th Avenue.

The improvements proposed as part of this project will increase the capacity of the interchanges and the adjacent arterial intersections.

Safety – The crash safety analysis indicates that the I-95 study area segments have experienced greater overall number of crashes for the years 2012 through 2014 than what would typically be anticipated on similar facilities. A review of the crash data indicates that traffic operational improvements could address some of the safety issues.

Additional I-95 entry and exit ramp capacity at these interchanges will improve the safety and overall flow of traffic within the project corridor and adjacent intersections.

System Linkage – I-95 is part of the State's SIS and the National Highway System. I-95 provides limited access connectivity to other major arterials such as I-595 and Florida's Turnpike. The project is not proposing to change system linkage. However, potential interchange modifications would improve movements within the existing network systems.

Modal Interrelationships – There are sidewalks in both directions and public transit routes along Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard. Additionally, there is a Tri-Rail Station in the northwest quadrant of the I-95/Hollywood Boulevard Interchange.

Capacity improvements within the study area will enhance the mobility of people and goods by alleviating current and future congestion at the interchanges and



on the surrounding freight and transit networks. Reduced congestion will serve to maintain and improve viable access to the major transportation facilities and businesses in the area.

Transportation Demand – The I-95 PD&E Study phase from south of Hallandale Beach Boulevard to north of Hollywood Boulevard is included in the Broward Metropolitan Planning Organization (MPO) 2045 Long Range Transportation Plan (LRTP), Transportation Improvement Program (TIP), FDOT Work Program, FDOT State TIP, and FDOT SIS Five Year Plan.

Social Demands and Economic Development – Social and economic demands on the I-95 corridor will continue to increase as population and employment increase. The Broward County MPO LRTP predicted that the population would grow from 1.9 million in 2018 to 2.2 million by 2045, an increase of 16 percent. Jobs were predicted to increase from 0.96 to 1.2 million during the same period, an increase of 25 percent.

The project intersects the cities of Hallandale Beach, Pembroke Park, and Hollywood, the third largest city in Broward County.

Emergency Evacuation – The project is anticipated to improve emergency evacuation capabilities by enhancing connectivity and accessibility to major arterials designated on the state evacuation route. I-95, Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard serve as part of the emergency evacuation route network designated by the Florida Division of Emergency Management and by Broward County. Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard move traffic from the east to I-95. I-95 is critical in facilitating traffic during emergency evacuation periods as it connects to other major arterials and highways in the state evacuation route network (i.e., I-595 and the Florida's Turnpike).



1.1.2 EXISTING CONDITIONS

I-95, within the study limits, consists of eight 11 to 12-foot wide general use lanes (four lanes in each direction), four 11-foot wide dynamically tolled express lanes (two in each direction), 12-foot wide auxiliary lanes at selected locations, 12-foot wide paved outside shoulders, 6 to 11-foot wide paved inside shoulders, a 2-foot wide median barrier wall, and outside roadway guardrails. The express lanes are buffer-separated from the general use lanes with express lane markers and a 3-foot wide buffer. **Figure 1.2** shows the roadway section north of Hallandale Beach Boulevard and **Figure 1.3** shows the roadway section north of Pembroke Road. **Figure 1.4** depicts the existing conditions schematic line diagram.

The existing limited access right-of-way varies slightly within the study limits. The right-of-way is generally consistent throughout the corridor except at the interchanges, where it varies to accommodate entrance and exit ramps. **Table 1.1** summarizes the available right-of-way along the corridor.

Table 1.1 - Summary of Existing Limited Access Right-of-Way

I-95 Roadway Section	Right-of-Way Width (feet)
Miami-Dade/Broward County Line – Hallandale Beach Boulevard	303
Hallandale Beach Boulevard – Pembroke Road	300
Pembroke Road – Hollywood Boulevard	315
Hollywood Boulevard – Johnson Street	343

Source: FDOT ROW Survey

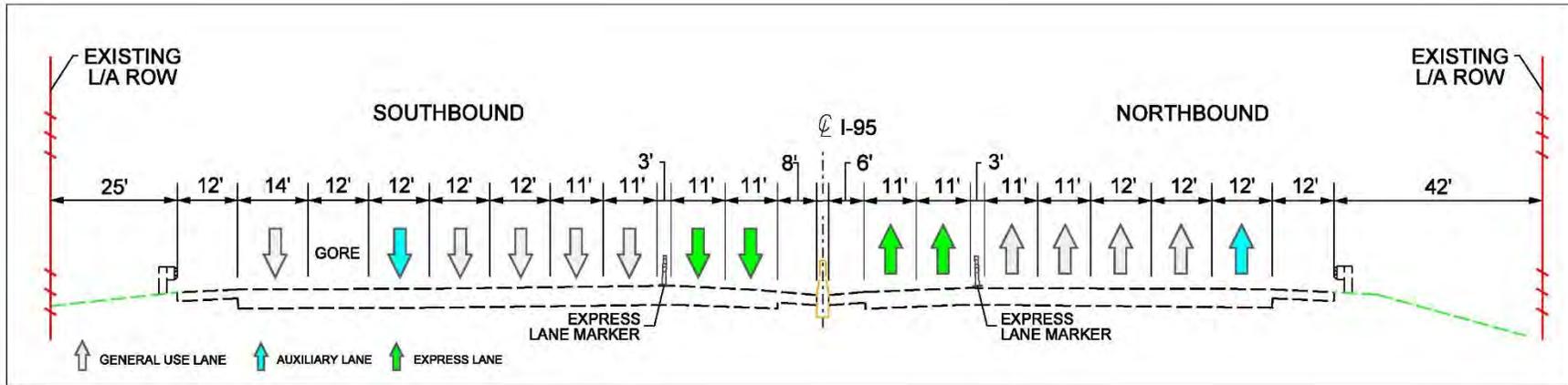


Figure 1.2 - I-95 Roadway Section North of Hallandale Beach Boulevard

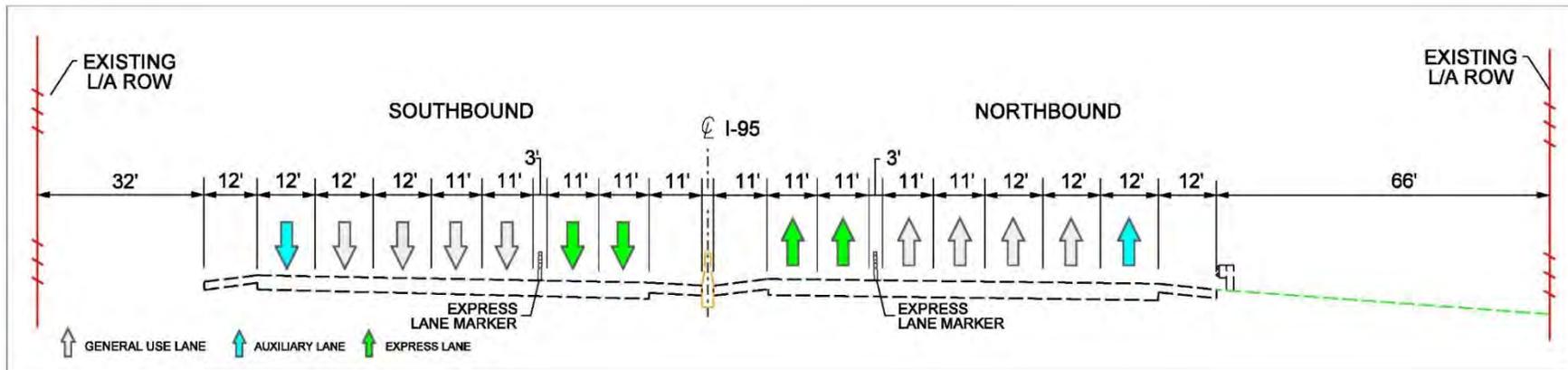
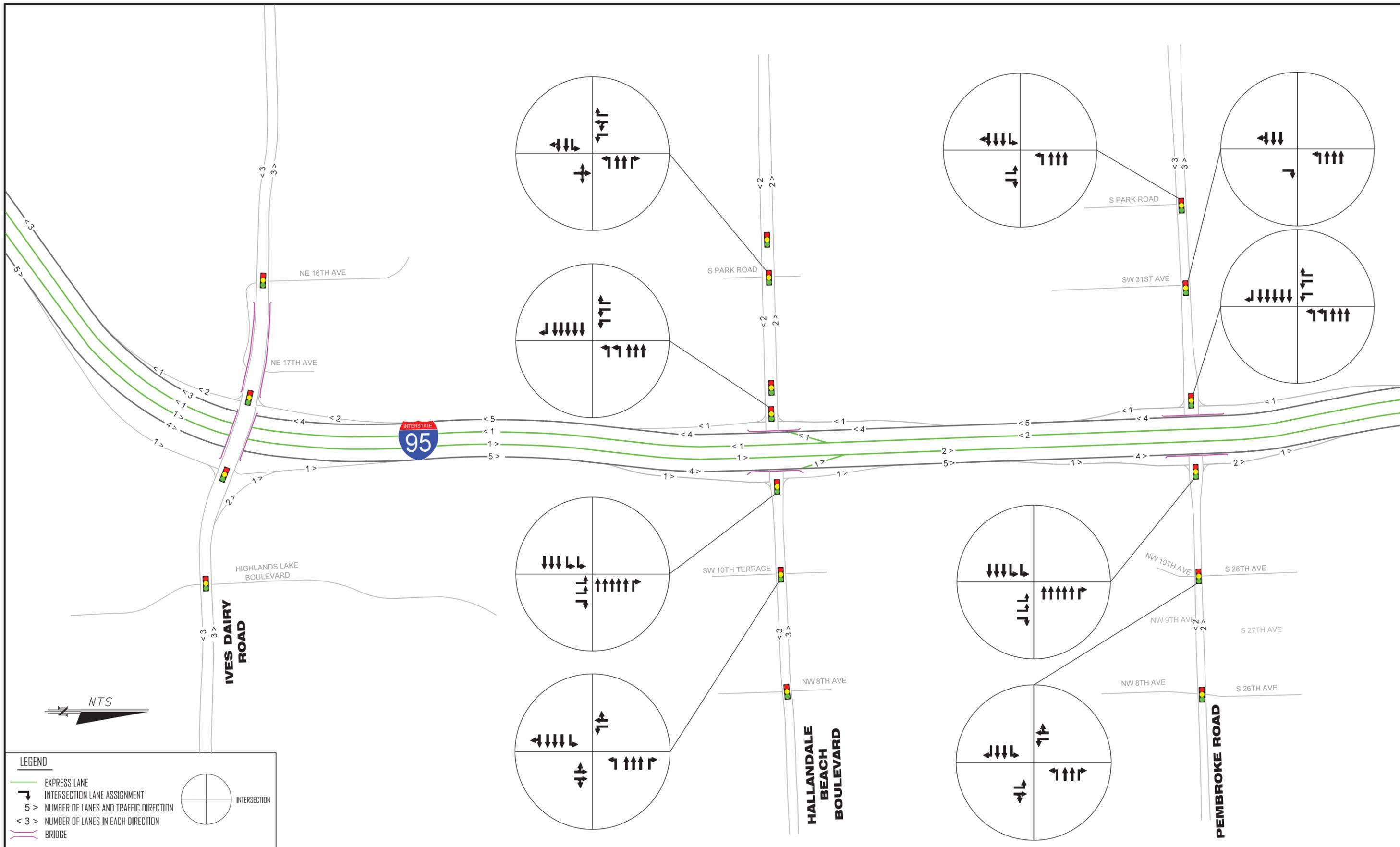
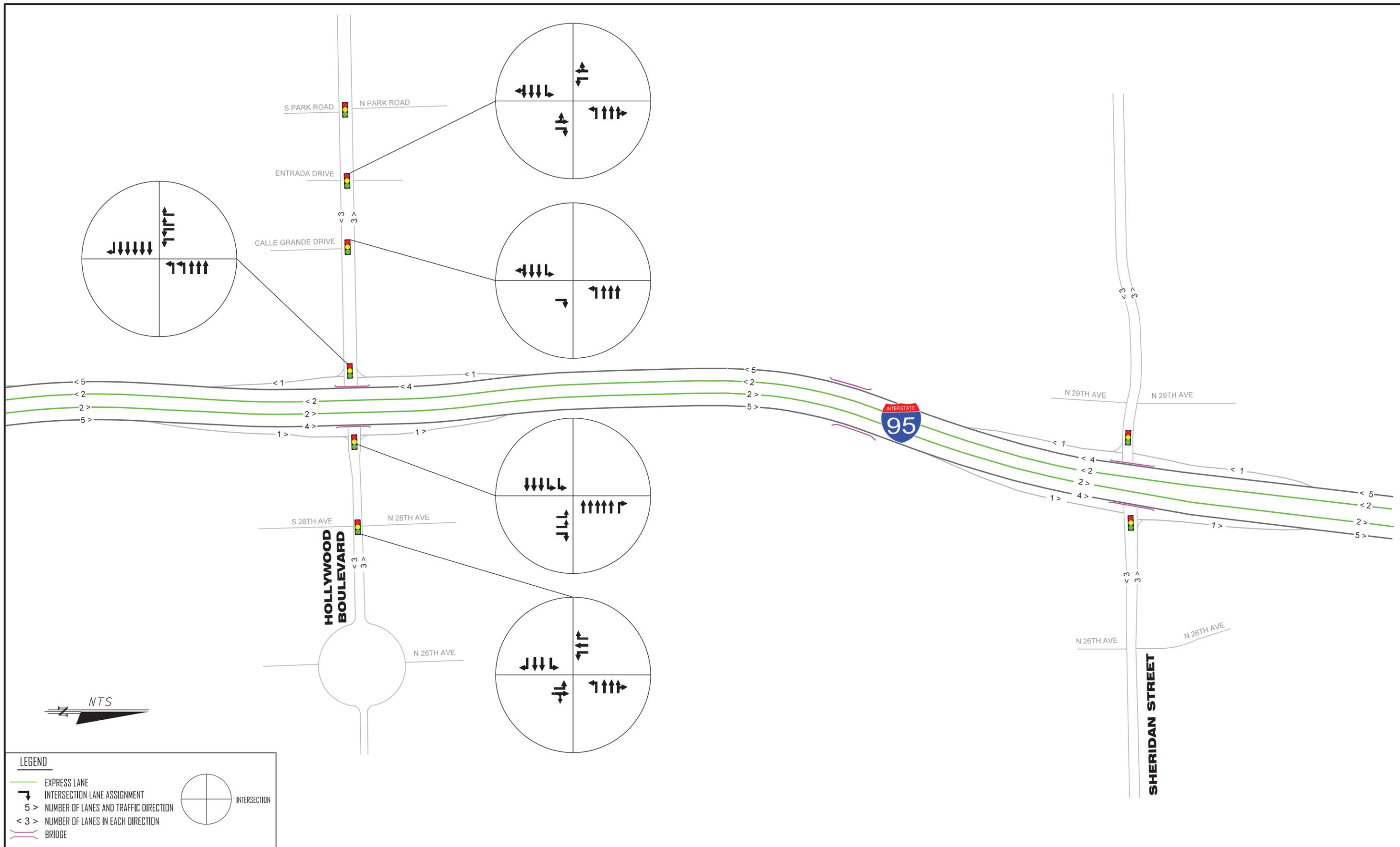


Figure 1.3 - I-95 Existing Roadway Section North of Pembroke Road





LEGEND

- EXPRESS LANE
- INTERSECTION LANE ASSIGNMENT
- 5 >** NUMBER OF LANES AND TRAFFIC DIRECTION
- < 3 >** NUMBER OF LANES IN EACH DIRECTION
- BRIDGE

INTERSECTION



1.2 PROPOSED IMPROVEMENTS

Alternatives evaluated during the PD&E Study include the No-Build Alternative and two Build Alternatives. Alternatives were developed and evaluated based on the ability to meet the project purpose and need.

1.2.1 NO-BUILD ALTERNATIVE

The No-Build Alternative includes the existing transportation network and any funded, planned or programmed improvements open to traffic by the design year. The No-Build Alternative includes only those improvements that are elements of the MPO's Transportation Improvement Program, the 2045 Cost Feasible LRTP, the FDOT's Adopted Five Year Work Program, any local government comprehensive plans and/or any development mitigation improvement projects that are elements of approved development orders.

The No-Build Alternative includes currently planned and programmed improvements. One of the programmed improvements are the safety short-term interim improvements at the Hallandale Beach Boulevard, Pembroke Road and Hollywood Boulevard interchanges. The No-Build Alternative includes the ongoing District Four I-95 Express Phase 3C Construction Project between south of Hollywood Boulevard and north of I-595. This construction project will add additional express lane access points (northbound egress and southbound ingress) within the Hollywood Boulevard Interchange. The No-Build Alternative also includes the District Six I-95 Planning Study between US 1 (Downtown Miami) and the Miami-Dade/Broward County Line. This planning study is proposing to add mainline capacity and interchange improvements by the design year of this project.

This alternative is considered to be a viable alternative to serve as a comparison to the study's proposed build alternatives.

The No-Build Alternative roadway sections are the same as the existing sections plus any future planned improvements. I-95, within the study limits, consists of eight 11 to 12-foot wide general use lanes (four lanes in each direction), four 11-foot wide dynamically tolled express lanes (two in each direction), 12-foot wide auxiliary lanes at selected locations, 12-foot wide paved outside shoulders, 6 to 11-foot wide paved inside shoulders, a 2-foot wide median barrier wall, and outside roadway guardrails. The express lanes are buffer-separated from the



general use lanes with express lane markers and a 3-foot wide buffer. *Figure 1.5* shows the roadway section north of Hallandale Beach Boulevard and *Figure 1.6* shows the roadway section north of Pembroke Road. *Figure 1.7* includes the modifications from the I-95 Express Phase 3C Construction Project. *Figure 1.8* depicts the No-Build Alternative schematic line diagram

1.2.2 BUILD ALTERNATIVES

Two build alternatives were evaluated to improve traffic operations within the study area for the I-95 mainline and interchanges. Build alternatives were developed with the goal of reducing congestion and delay while also maximizing the efficiency of the transportation system.

Alternative 1 – This alternative proposes braided ramps between interchanges to improve substandard weaving movements along I-95. In this alternative, the on-ramps from each interchange will remain unchanged. However, the off-ramps to Pembroke Road and Hollywood Boulevard in the northbound direction and to Pembroke Road and Hallandale Beach Boulevard in the southbound direction will be located one interchange prior to the destination interchange. For example, travelers destined northbound to Pembroke Road would use an exit ramp located just south of the Hallandale Beach Boulevard corridor right after the Hallandale Beach Boulevard off-ramp. The new exit ramp will continue separated from the I-95 mainline braiding over the Hallandale Beach Boulevard on-ramp and continuing along the right-of-way line until reaching the cross-street ramp terminal. This new exit ramp bypasses and avoids conflicts with the Hallandale Beach Boulevard on-ramp. The same design continues northbound to Hollywood Boulevard and southbound to Pembroke Road and Hallandale Beach Boulevard. *Figure 1.9* shows the roadway section north of Hallandale Beach Boulevard and *Figure 1.10* shows the roadway section north of Pembroke Road. *Figure 1.11* shows the schematic geometric layout of Alternative 1.

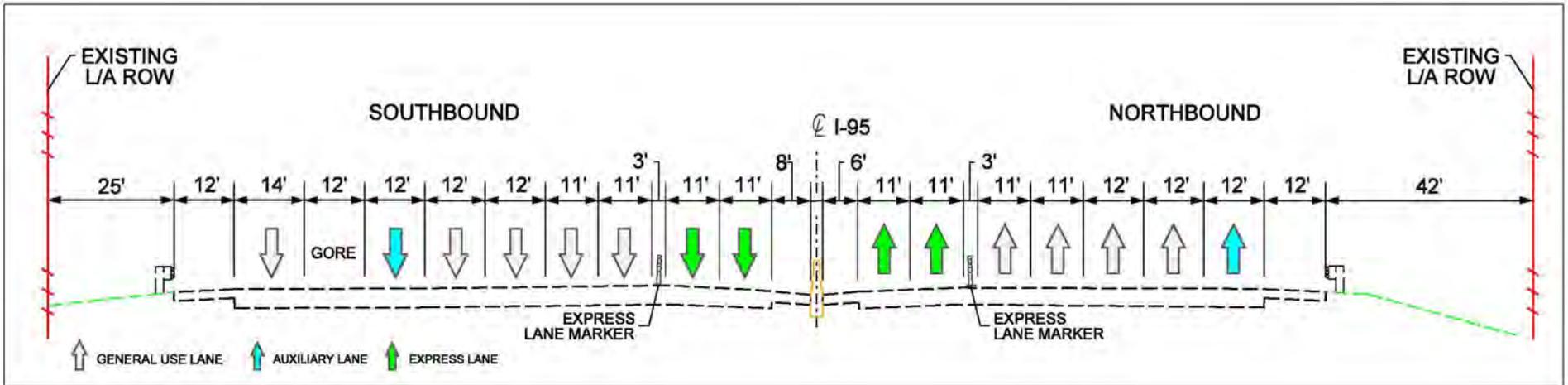


Figure 1.5 - I-95 No-Build Alternative Roadway Section North of Hallandale Beach Boulevard

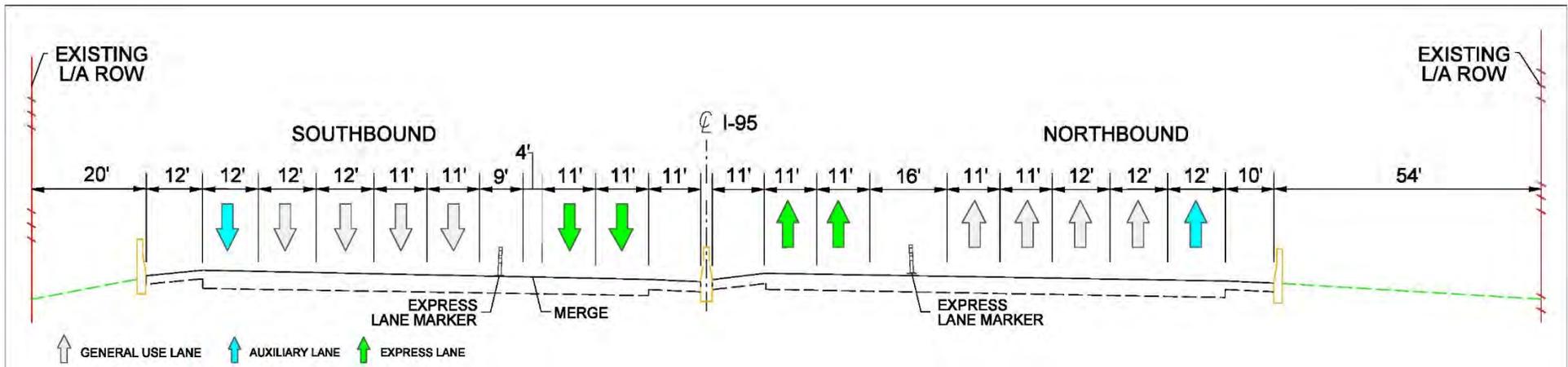
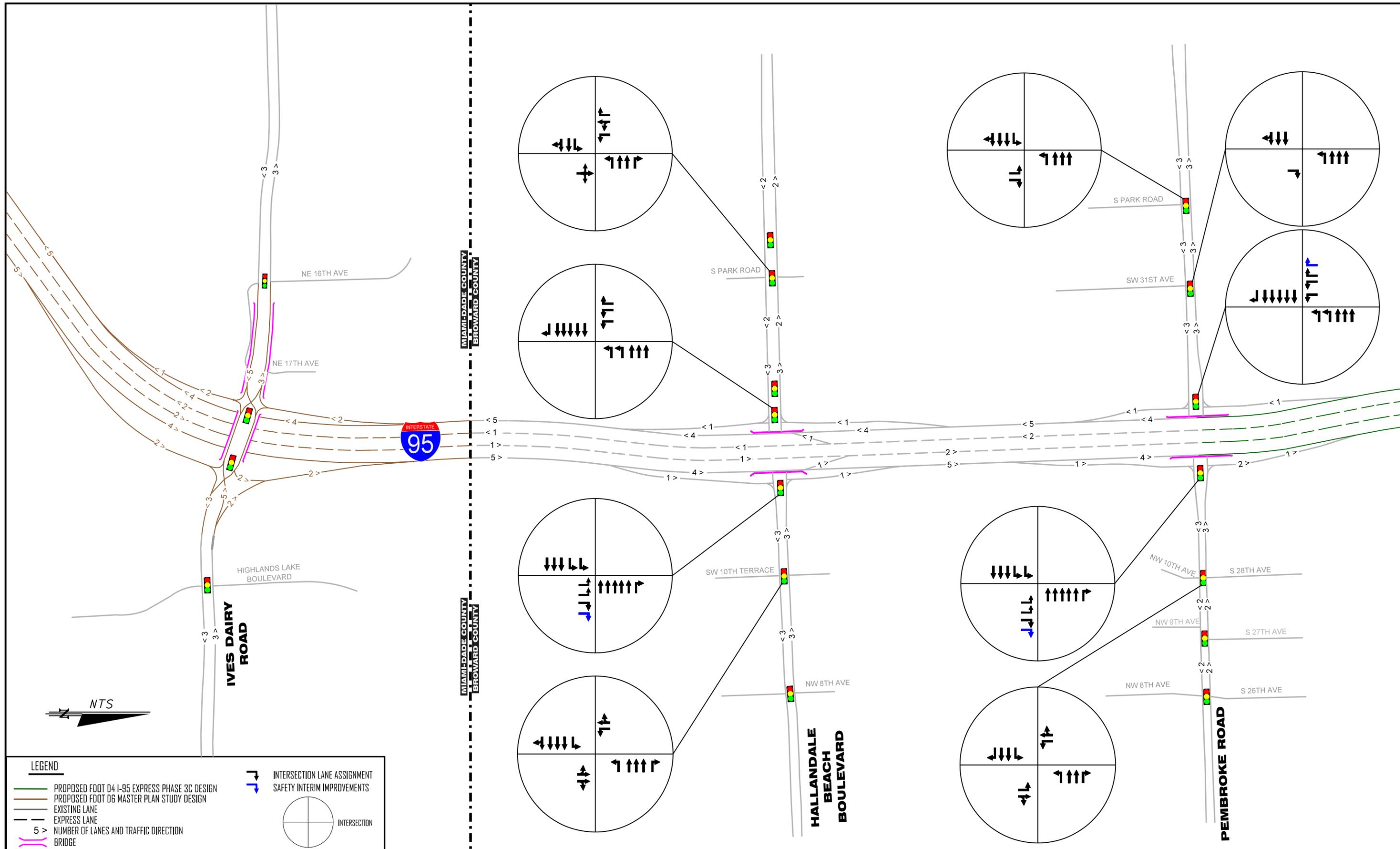


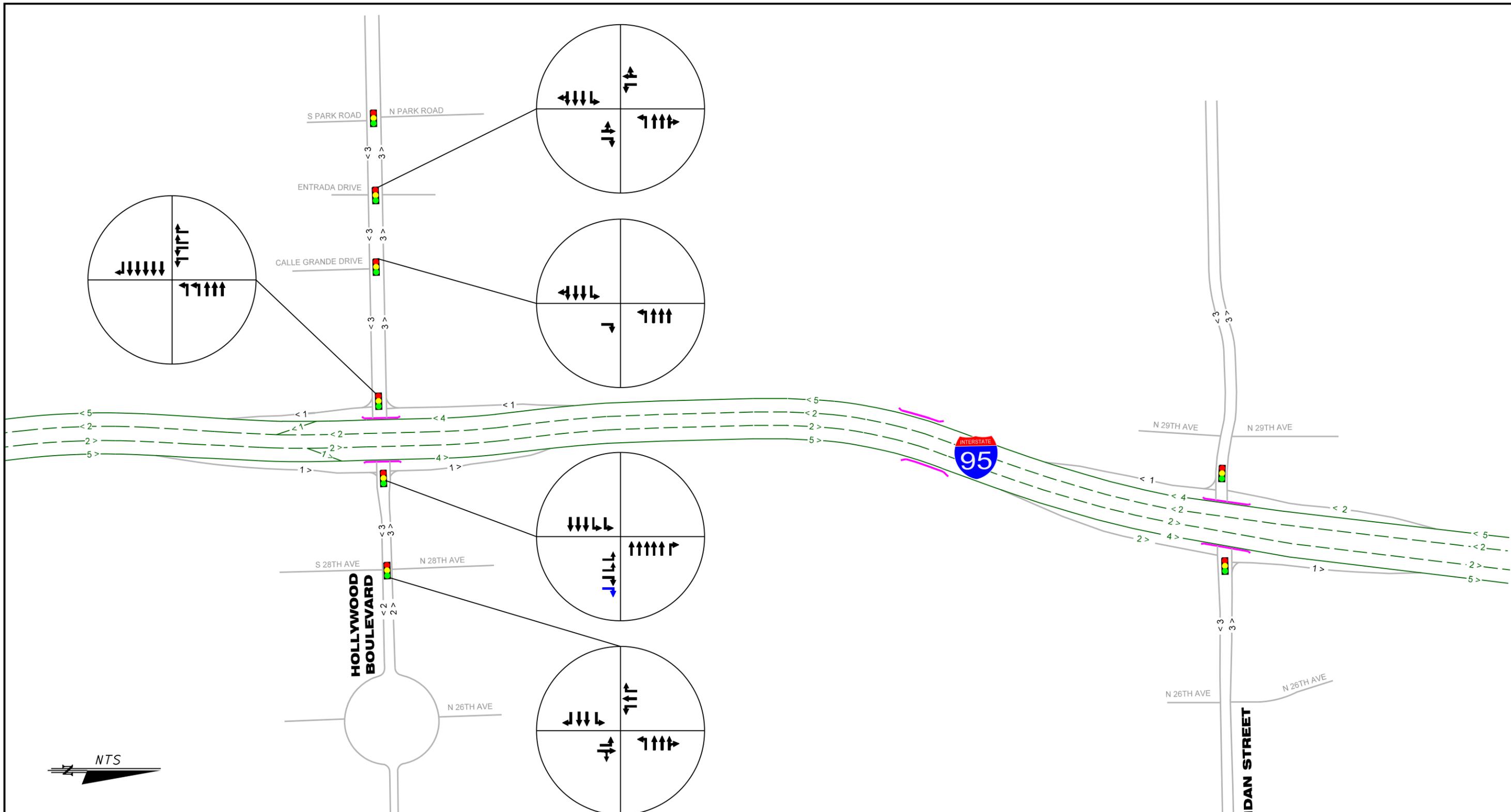
Figure 1.6 - I-95 No-Build Alternative Roadway Section North of Pembroke Road



LEGEND

- PROPOSED FDOT D4 I-95 EXPRESS PHASE 3C DESIGN
- PROPOSED FDOT D6 MASTER PLAN STUDY DESIGN
- EXISTING LANE
- EXPRESS LANE
- 5 > NUMBER OF LANES AND TRAFFIC DIRECTION
- BRIDGE

↔ INTERSECTION LANE ASSIGNMENT
↔ SAFETY INTERIM IMPROVEMENTS
 INTERSECTION



LEGEND

- PROPOSED FDOT D4 I-95 EXPRESS PHASE 3C DESIGN
- PROPOSED FDOT D6 MASTER PLAN STUDY DESIGN
- EXISTING LANE
- EXPRESS LANE
- 5 > NUMBER OF LANES AND TRAFFIC DIRECTION
- BRIDGE
- INTERSECTION LANE ASSIGNMENT
- SAFETY INTERIM IMPROVEMENTS
- INTERSECTION

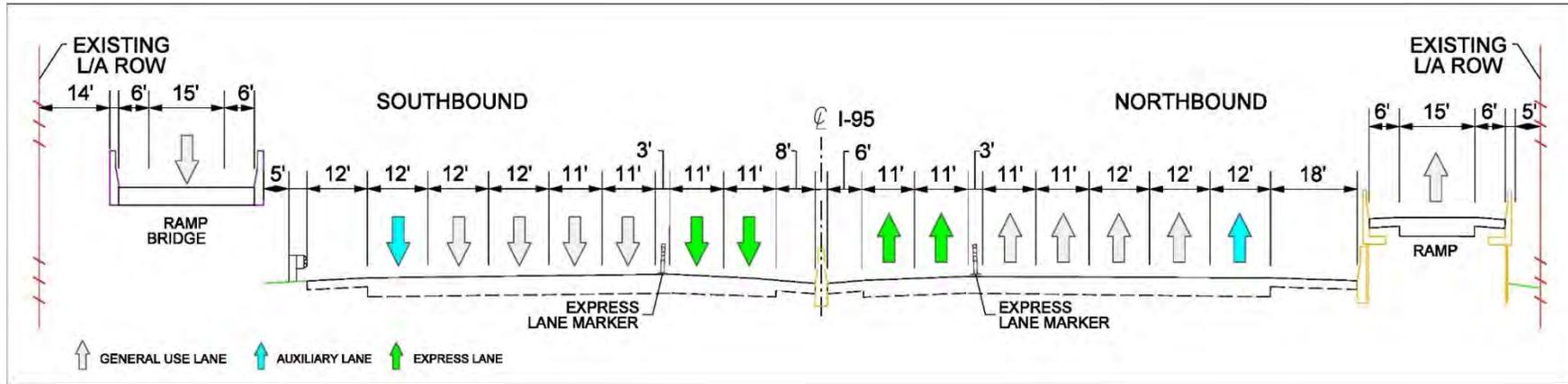


Figure 1.8 – I-95 Alternative 1 Roadway Section North of Hallandale Beach Boulevard

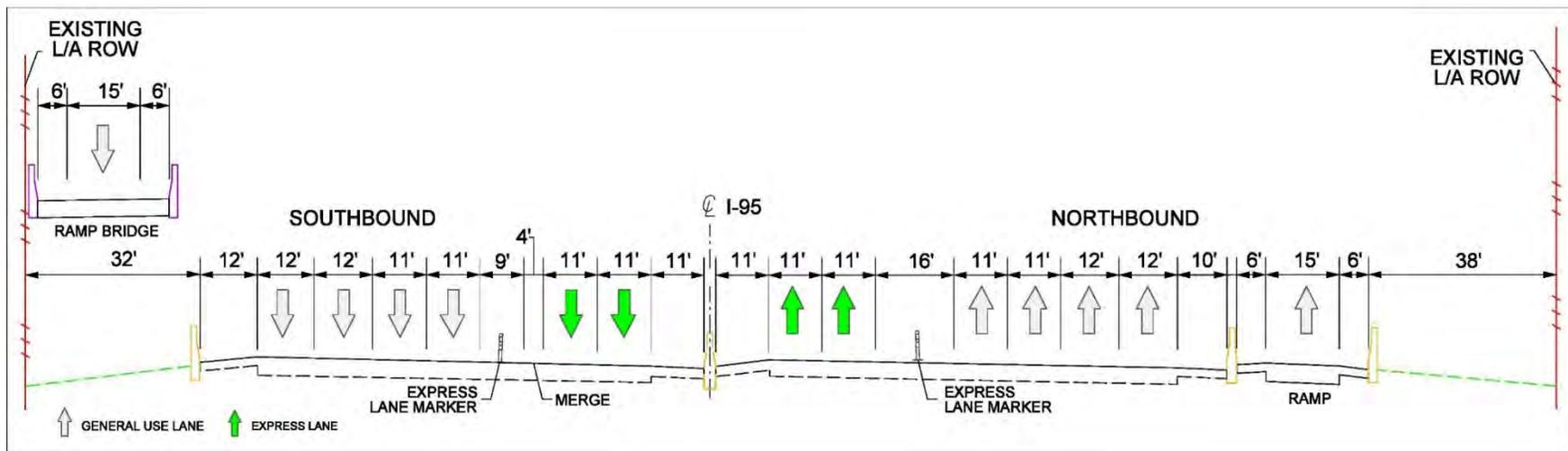
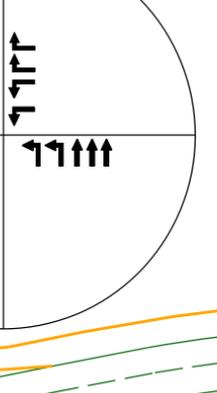
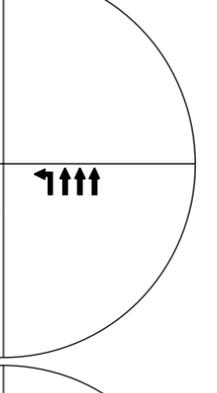
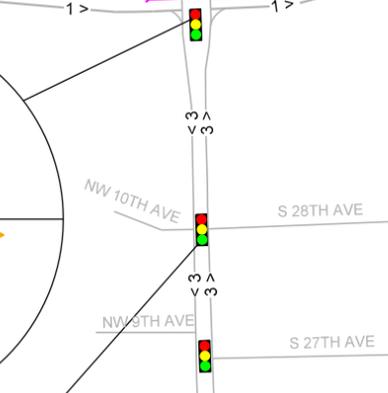
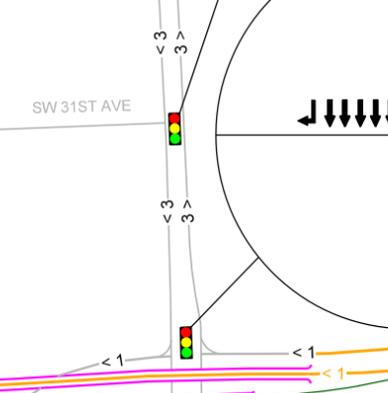
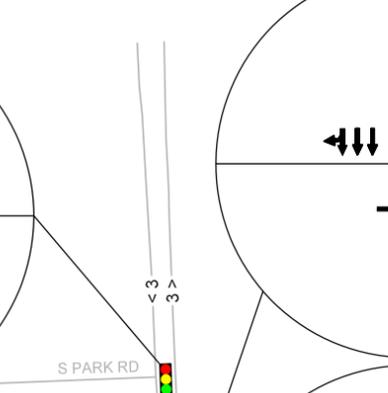
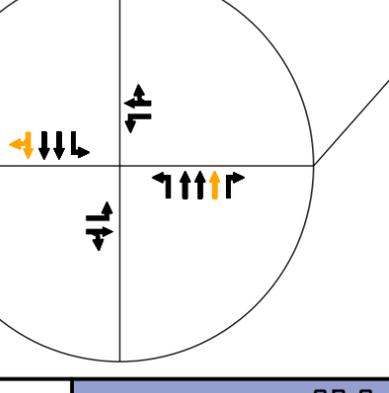
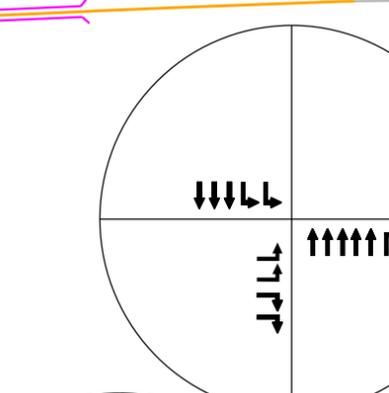
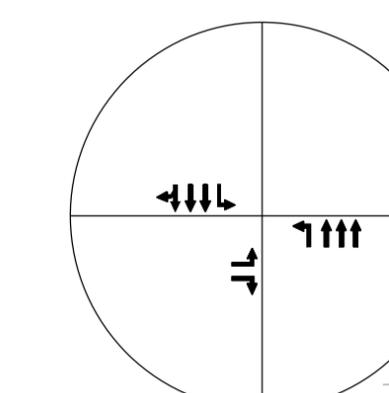
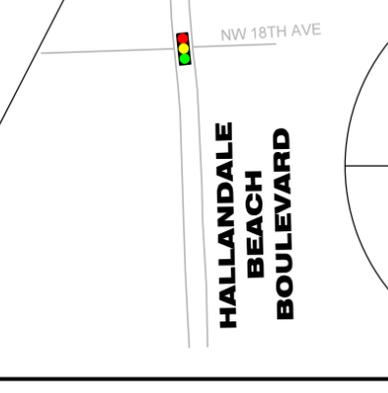
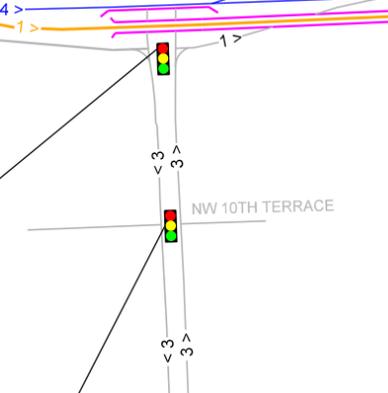
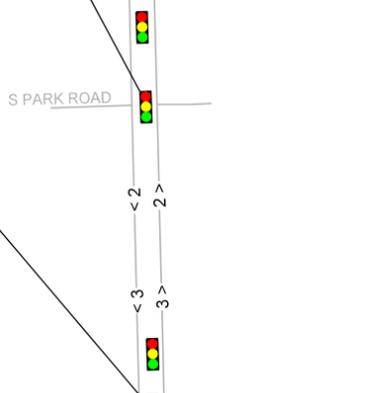
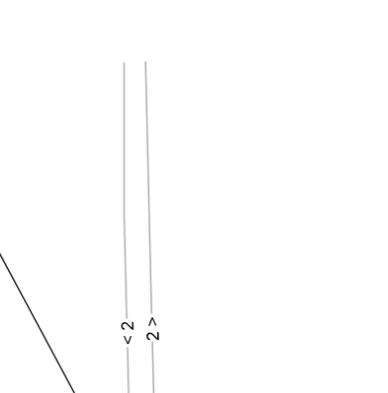
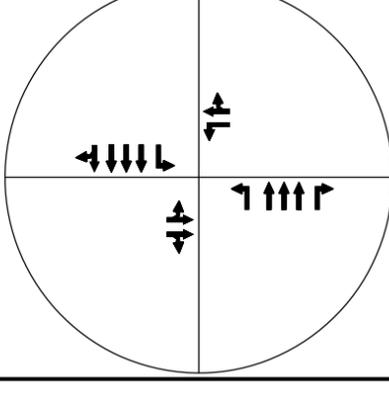
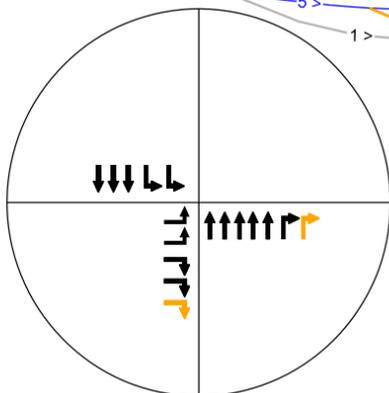
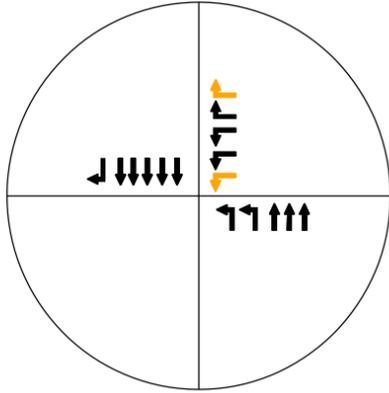
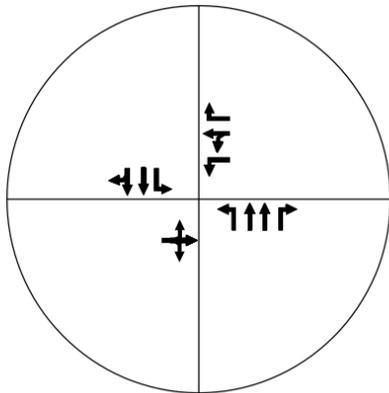
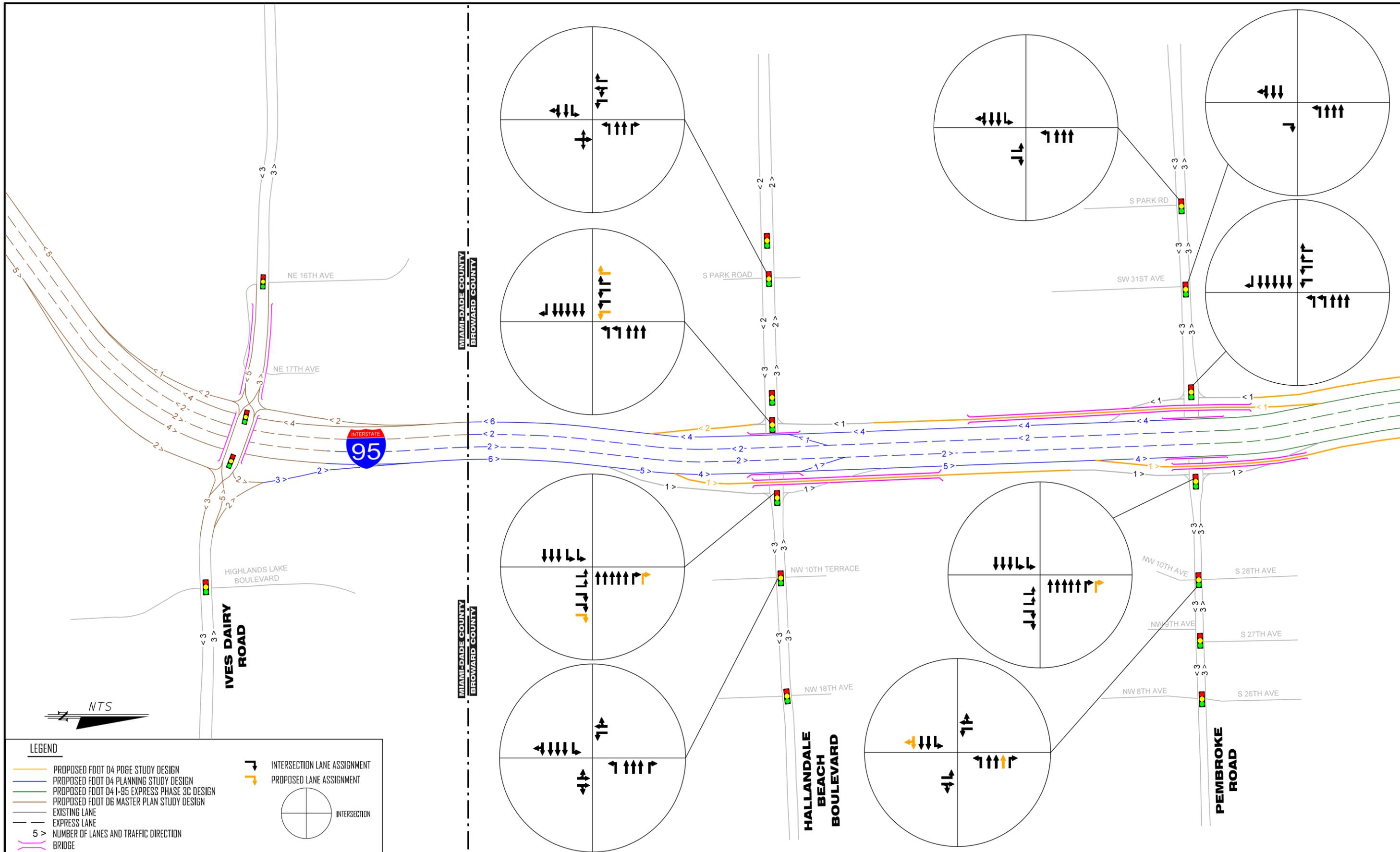


Figure 1.9 – I-95 Alternative 1 Roadway Section North of Pembroke Road



LEGEND

- PROPOSED FDOT D4 PO&E STUDY DESIGN
- PROPOSED FDOT D4 PLANNING STUDY DESIGN
- PROPOSED FDOT D4 I-95 EXPRESS PHASE 3C DESIGN
- PROPOSED FDOT D6 MASTER PLAN STUDY DESIGN
- EXISTING LANE
- EXPRESS LANE
- 5 > NUMBER OF LANES AND TRAFFIC DIRECTION
- BRIDGE

INTERSECTION LANE ASSIGNMENT
 PROPOSED LANE ASSIGNMENT
 INTERSECTION



FLORIDA DEPARTMENT OF TRANSPORTATION
 DISTRICT FOUR
 3400 WEST COMMERCIAL BOULEVARD
 FORT LAUDERDALE, FL 33309

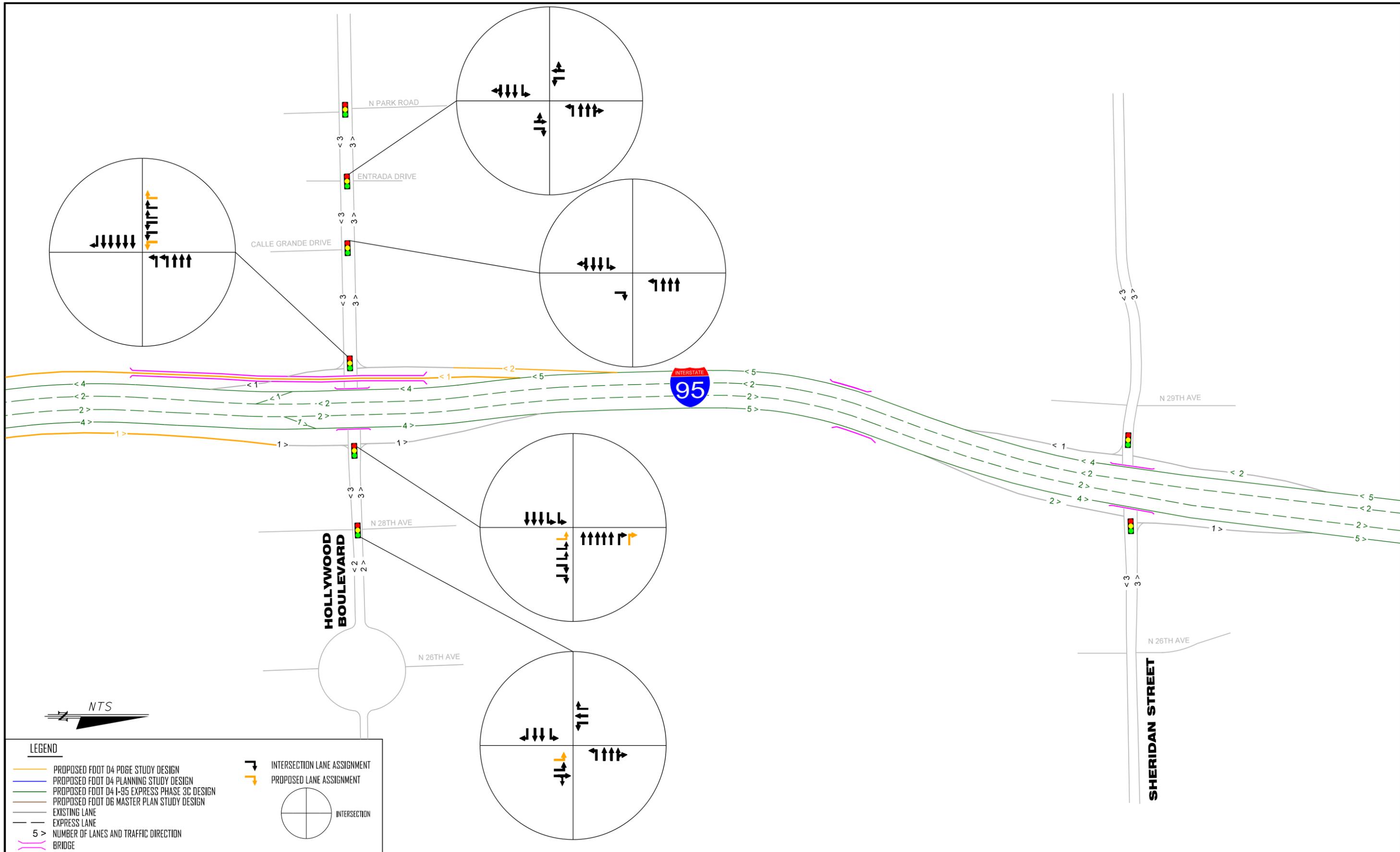
OCTOBER 2020



I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY
 from South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
 FPID No.: 436903-I-22-02
 ETDM No.: 14254

**SR 9 (INTERSTATE 95)
 LANE GEOMETRY AND CONFIGURATIONS
 ALTERNATIVE 1 LINE DIAGRAM**

**FIGURE
 1.10
 1-17**





Alternative 2 – This alternative proposes a collector distributor roadway system within the I-95 mainline project area. The collector distributor roadway system will remove the Pembroke Road Interchange from interacting with the I-95 mainline. In the northbound direction, all exiting traffic to Pembroke Road and Hollywood Boulevard will utilize a new collector distributor off-ramp just south of Hallandale Beach Boulevard. The collector distributor roadway system will extend to just north of Hollywood Boulevard serving the exit traffic to Pembroke Road, entry traffic from Pembroke Road and entry traffic from Hollywood Boulevard. In the southbound direction, the new collector distributor roadway system will not be continuous, it will end and begin at Pembroke Road. The first section combines the off-ramps to Hollywood Boulevard and Pembroke Road and the second section moves the Pembroke Road on-ramp to enter I-95 south of the Hallandale Beach Boulevard on-ramp. **Figure 1.11** shows the roadway section north of Hallandale Beach Boulevard and **Figure 1.12** shows the roadway section north of Pembroke Road. **Figure 1.13** shows the schematic geometric layout of Alternative 2.

The PD&E Study is also evaluating widening and turn lane modifications of the ramp terminals and selected adjacent intersections along Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard. These improvements will facilitate the ramp modifications and improve the access and operation of the corridors upstream and downstream from the interchanges. These improvements are the same in both alternatives.

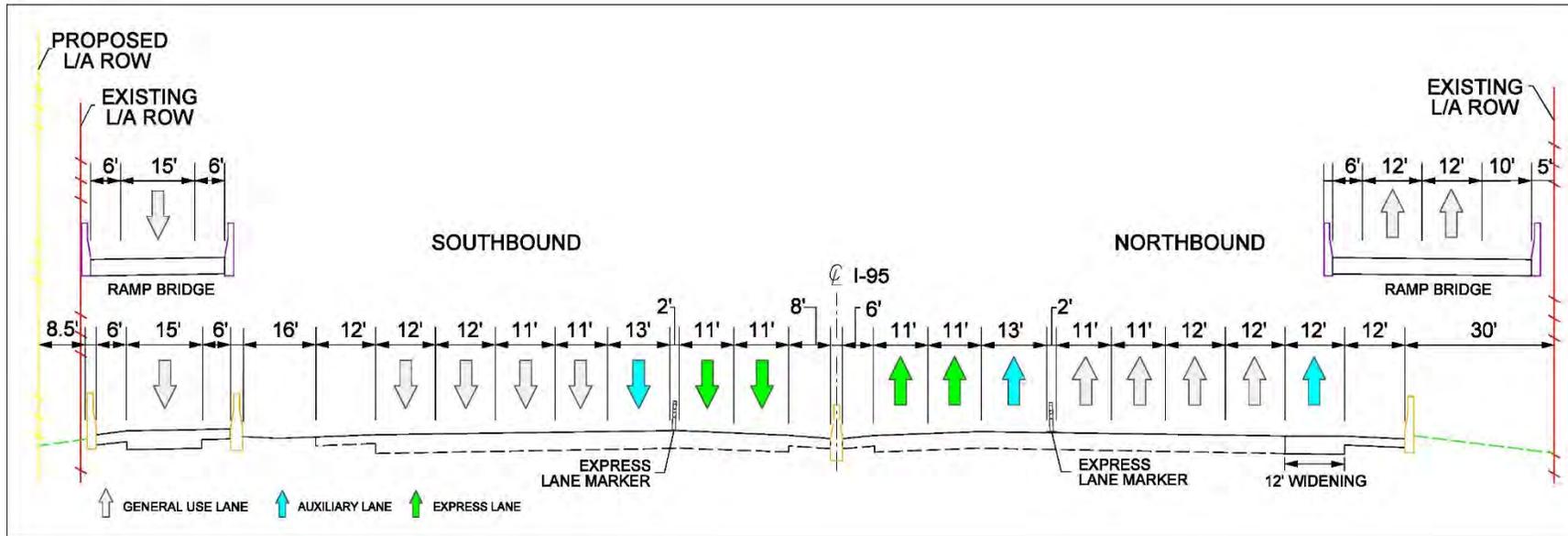


Figure 1.11 – I-95 Alternative 2 Roadway Section North of Hallandale Beach Boulevard

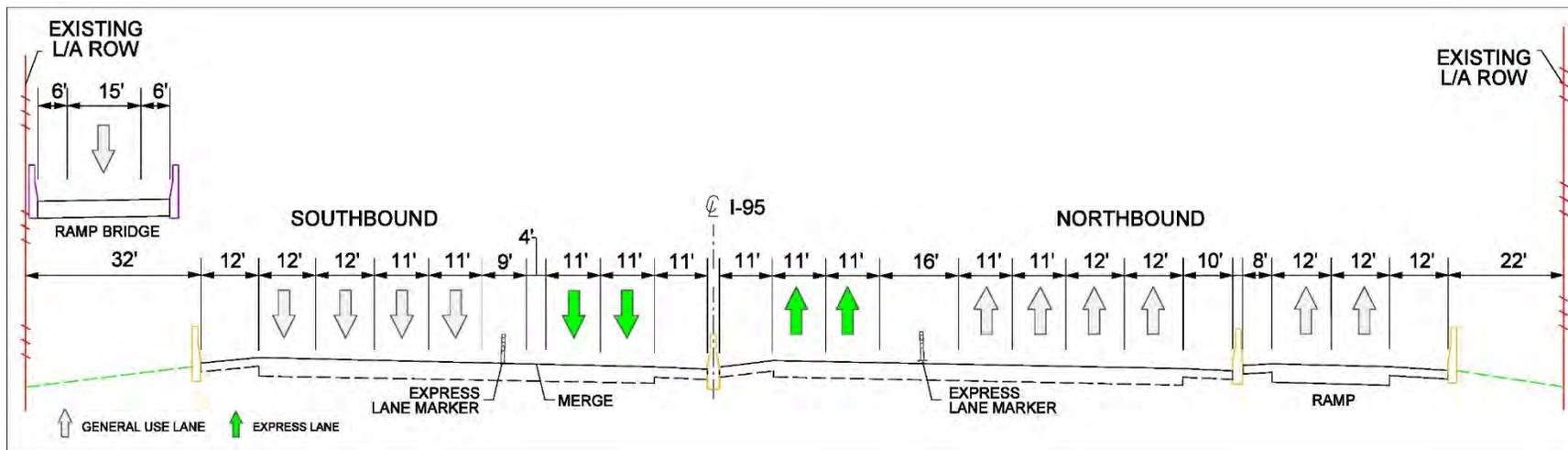
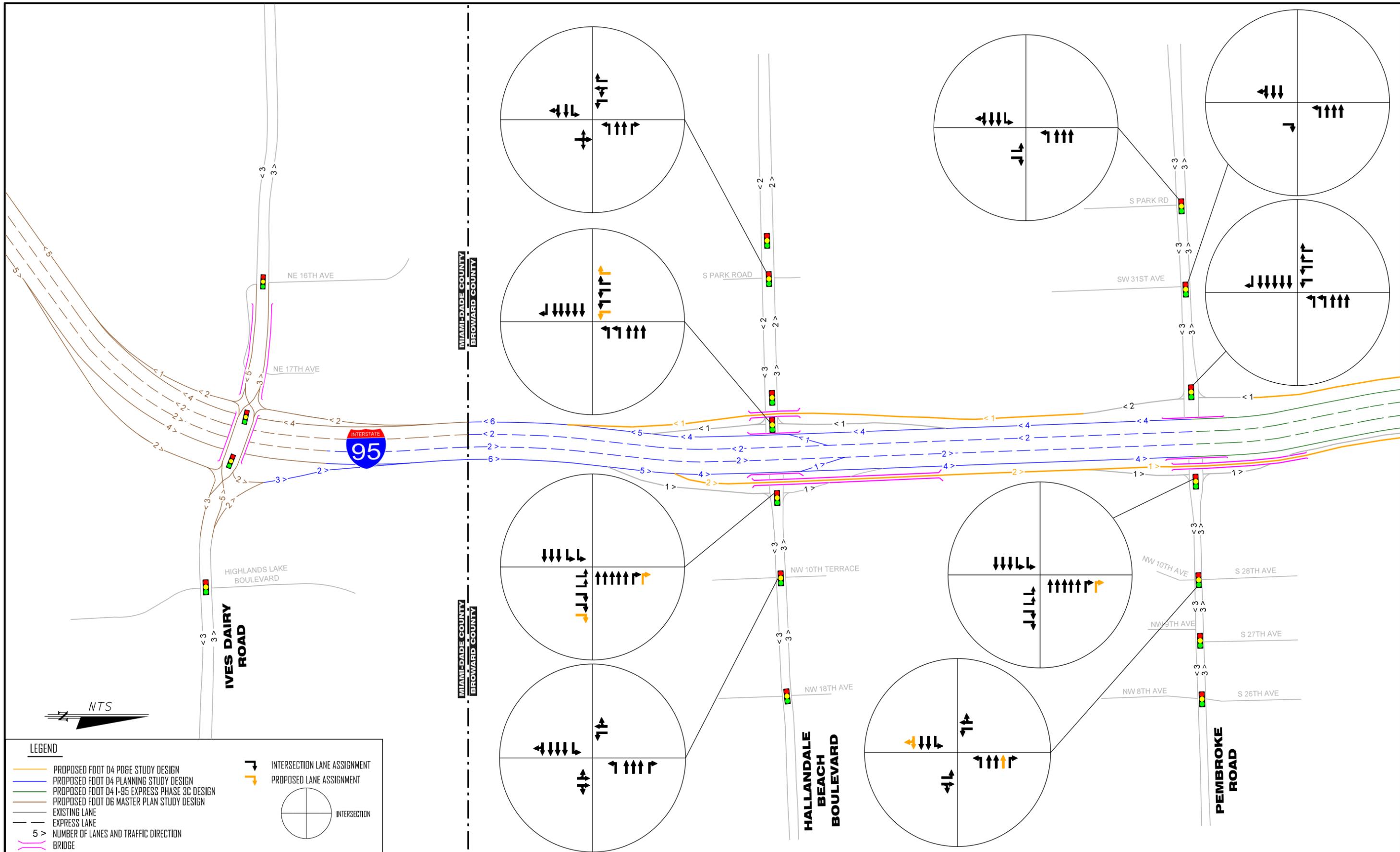


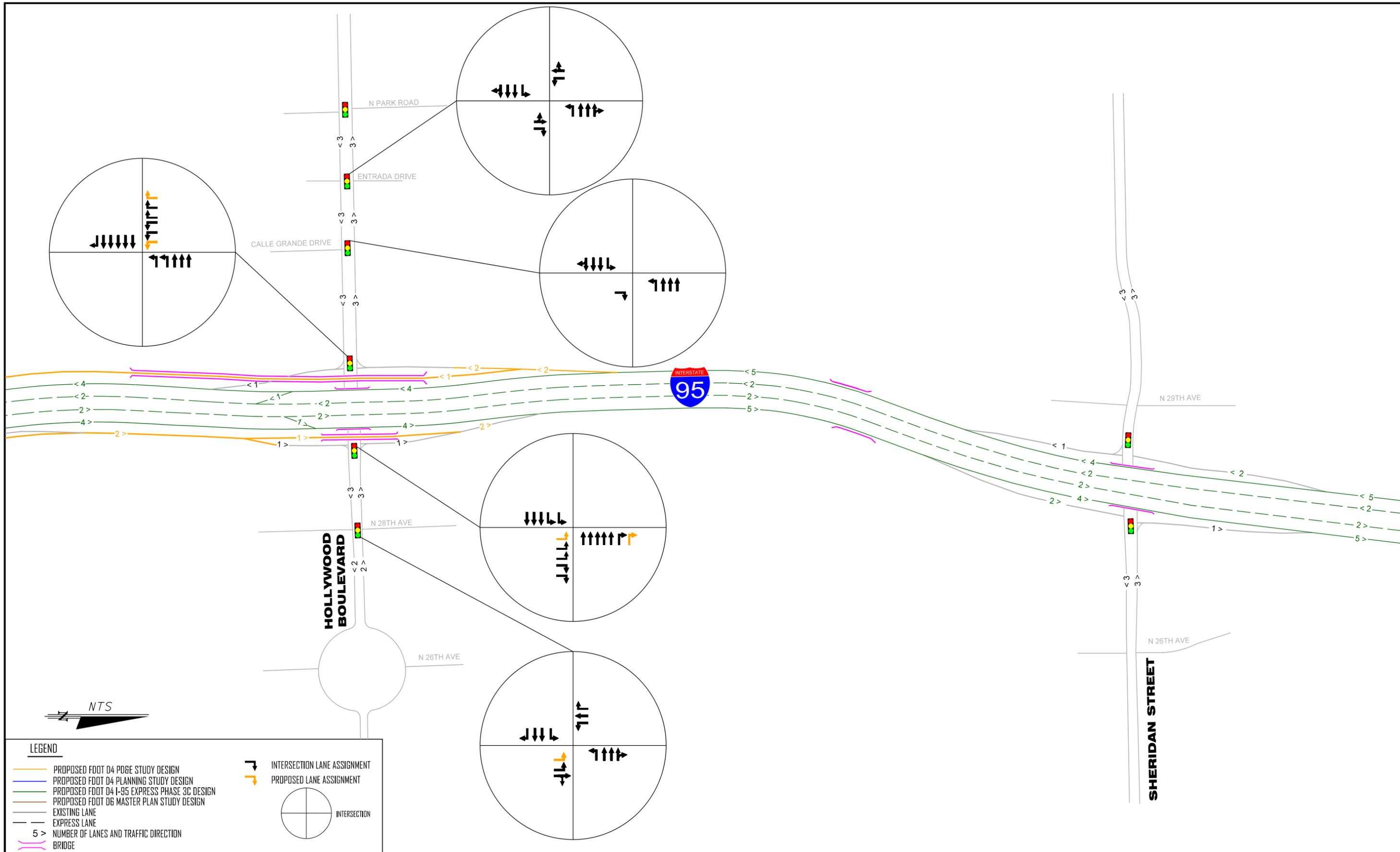
Figure 1.12 – I-95 Alternative 2 Roadway Section North of Pembroke Road



LEGEND

- PROPOSED FDOT D4 PO&E STUDY DESIGN
- PROPOSED FDOT D4 PLANNING STUDY DESIGN
- PROPOSED FDOT D4 I-95 EXPRESS PHASE 3C DESIGN
- PROPOSED FDOT D6 MASTER PLAN STUDY DESIGN
- EXISTING LANE
- EXPRESS LANE
- 5 > NUMBER OF LANES AND TRAFFIC DIRECTION
- BRIDGE

INTERSECTION LANE ASSIGNMENT
 PROPOSED LANE ASSIGNMENT
 INTERSECTION





1.2.2 BUILD ALTERNATIVES

The preferred alternative for the I-95 corridor is Alternative 2. Alternative 2 was selected based on the alternative alignment analysis and the evaluation results summarized as part of the PD&E Study. Alternative 2 will add the capacity improvements necessary to improve traffic operations, safety, transit, system linkage, modal interrelationships, transportation demand, social demand, economic development, interchange access and emergency evacuation. Alternative 2 is the most prudent when compared with Alternative 1 for the following reasons:

- Removing the Pembroke Road interchange from directly interacting with I-95 improves the mobility and access in and out of Pembroke Road and adjacent roadways;
- Reduces the number of entrances and exits to and from I-95, which improves the overall operations of the I-95 mainline, ramps, and interchanges;
- Reduces long-term crashes related to heavy congestion, mainline weaving maneuvers, mainline and ramp speed differentials, and interstate access;
- The collector distributor roadway system removes I-95 mainline traffic, which provides more capacity to several mainline segments of I-95;
- Provides the ability to enhance/improve bus service, which offers an alternative to auto travel and addresses needs of low-income users and disadvantaged groups;
- Provides more off-ramp storage and requires less signage on the mainline due to less access points; and
- Lower construction cost.



2.0 METHODOLOGY

This study was conducted based on the methodology described in the FDOT's PD&E Manual, Part 2, Chapter 18, *Highway Traffic Noise* (July 1, 2020), the FDOT's *Traffic Noise Modeling and Analysis Practitioners Handbook* (December 31, 2018), and in accordance with Title 23 CFR Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (July 13, 2010). The noise study involved the following procedures:

- Field Measurement of Noise Levels and Noise Model Validation (see **Section 3.1**);
- Identification of Noise Sensitive Receptor Sites (see **Section 3.2**);
- Prediction of Existing and Future Noise Levels (see **Section 3.2**);
- Assessment of Traffic Noise Impacts (see **Section 3.2**); and
- Consideration of Noise Barriers as a Noise Abatement Measure at sites exceeding FDOT's Noise Abatement Criteria (see **Section 4.0**).

The latest approved version of the FHWA's Traffic Noise Model (TNM), Version 2.5 – dated February 2004, was used to predict existing and future traffic noise levels and to analyze the effectiveness of noise barriers, where warranted. 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.

Representative receptor sites were used as inputs to the TNM 2.5 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, traffic noise levels were predicted where the exterior activity occurs. For the prediction of interior noise levels, receptor sites were placed approximately ten feet inside the building at the edge closest to the roadway. Building noise reduction factors and window conditions identified in Table 18.3 in Part 2, Chapter 18 of the PD&E Manual (January 14, 2019) were used to estimate noise reduction due to the physical structure.



The following sections describe the noise metrics, traffic data, and noise abatement criteria used in this study.

2.1 NOISE METRIC

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

Table 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) Garbage Disposal at 1 m (3 ft)
Noise Urban Area (Daytime)	---80---	
Gas Lawn Mower at 100 ft	---70---	Vacuum Cleaner at 10 ft Normal Speech at 3 ft
Commercial Area	---60---	
Heavy Traffic at 300 ft	---50---	Large Business Office Dishwasher Next Room
Quiet Urban Daytime	---40---	Theater, Large Conference Room (Background)
Quiet Urban Nighttime	---30---	Library
Quiet Suburban Nighttime	---20---	Bedroom at Night, Concert Hall (Background)
Quiet Rural Nighttime	---10---	
Lowest Threshold of Human Hearing	---0---	Lowest Threshold of Human Hearing

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



2.2 TRAFFIC DATA

Predicted traffic noise levels are primarily dependent on traffic volumes, vehicle mix, and vehicle speeds. The traffic volumes used in this noise analysis is from the *Project's Traffic Analysis Technical Memorandum* (November 2018). The peak hour volumes for the Existing Conditions (2016) and design hour volumes for the future design year (2045) conditions for the No-Build Alternative and the Build Alternatives from this report were used in the noise modeling and are shown in **Figures 6.2, 10.5, and 10.11**, respectively, in **Appendix A**. In addition, **Appendix A** includes the Traffic Data for Noise Studies tables that summarizes the demand peak hour volumes, Level of Service (LOS) C volumes, and speeds for I-95 mainline, express lanes, and arterial roadways (i.e., Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard). These tables also summarize the traffic data used in the prediction of traffic noise levels by vehicle type (cars, medium trucks, heavy trucks, buses, and motorcycles). Consistent with Chapter 18 of the PD&E Manual, the maximum peak-hourly traffic representing Level of Service (LOS) "C", or demand LOS of "A", "B", or "C" was used. In overcapacity situations, this represents the highest traffic volume traveling at the highest average speed, which typically generates the highest noise levels at a given site during a normal day. Since the existing I-95 volumes exceeded LOS C volumes, the existing noise levels are representative of the No-Build conditions.

2.3 NOISE ABATEMENT CRITERIA

The FHWA has established Noise Abatement Criteria (NAC) for land use activity categories, which are presented in **Table 2.2**. 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, meet, 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.

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



Table 2.2 – Noise Abatement Criteria [Hourly A-Weighted Sound Level dB(A)]

Activity Category	Activity Leq(h) ¹		Evaluation Location	Description of Activity Category
	FHWA	FDOT		
A	57	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B ²	67	66	Exterior	Residential
C ²	67	66	Exterior	Active sports areas, 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 ²	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	–	–	–	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	–	–	–	Undeveloped lands that are not permitted.

(Based on Table 1 of 23 CFR Part 772)

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

² Includes undeveloped lands permitted for this activity category.

Note: FDOT defines that a substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 decibels or more as a result of the transportation improvement project. When this occurs, the requirement for abatement consideration will be followed.



specifically covered in Category A (i.e., lands on which serenity and quiet are of extraordinary significance) 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, which include 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.

2.4 NOISE ABATEMENT MEASURES

When traffic noise associated with a proposed project is predicted to approach, meet, or exceed the NAC at a noise sensitive site, noise abatement measures must be considered in accordance with 23 CFR Part 772. 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 *Highway Traffic Noise: Analysis and Abatement Guidance* (December 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.

Other abatement measures that were considered but were determined not to be feasible or reasonable for this project include traffic management, alignment modification, and property acquisition. Traffic management measures such as traffic control devices, prohibition of certain vehicle types, time-use restriction for certain vehicle types, modified speed limits, and exclusive lane designation applied for the purpose of reducing traffic noise levels would impede the operational characteristics of this facility. The project corridor includes existing commercial and residential development on both sides of I-95. Shifting the alignments or modifications to the proposed alignments would directly impact these areas and result in substantial socio-economic effects and additional project costs. Acquisition of right-of-way from the noise sensitive properties



impacted by the project would be more expensive and disruptive than the other noise abatement measures.

For noise abatement measures to be recommended for further consideration in the design phase of the project, they must be determined to be both feasible and reasonable. 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 at least two impacted receptor sites. For example, given the topography of a location, can the minimum noise reduction [5 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 estimated cost of the noise barrier, or other noise abatement measure, needs to be equal to or below FDOT's reasonable cost criteria (described below), must attain FDOT's noise reduction design goal of 7 dB(A) at one or more benefited 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) is based on different methods and are evaluated separately. When determining the cost reasonableness of a conceptual noise barrier design for a residential area, an estimated cost of \$42,000 per benefited receptor is considered the upper limit, using the FDOT's current 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 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 actual noise barrier construction costs such as dollar per square foot of a noise barrier. The derivation of the Abatement Cost Factor is based on the FDOT's reasonable cost criteria of equal to or less than \$42,000 per benefited receptor site.

If 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 viewpoint of the potentially benefited receptors (property owners/tenants) regarding noise abatement is gathered during workshops and at the Public Hearing. During the 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 recommended 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.

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 receptor sites. Ground mounted noise barriers, which are also referred to as concrete post-and-panel noise barriers, are usually constructed in the vicinity of the right-of-way line. Ground mounted noise barriers are typically evaluated in heights ranging from 12 to 22 feet. Shoulder mounted noise barriers are constructed along the outside edge of the roadway shoulder (i.e., at the edge-of-pavement). Typically, shoulder mounted noise barriers are used in areas with limited available right-of-way or on elevated roadway sections because ground mounted noise barriers are often less effective in these areas. Due to



safety and constructability issues, the height of shoulder mounted noise barriers is limited to 14 feet, except on structures such as bridges and retaining walls such as mechanically stabilized earth (MSE) wall. The maximum height of noise barriers on structures is 8 feet unless specifically approved in writing by the State Structures Design Engineer. Only the noise barrier heights that would likely be effective were analyzed and are presented in the noise barrier summary tables of this report.



3.0 TRAFFIC NOISE ANALYSIS

The project corridor includes eight existing noise barriers/systems that provide benefits to most of the adjacent noise sensitive sites. The location and description of the existing noise barriers are summarized below and are depicted in **Figure 3.1** located at the end of **Section 3.2**. As described in Section 4.0, segments of these existing noise barrier will be physically impacted by the proposed project improvements and will require that they be removed and replaced.

- Ground mounted noise barrier along the western right-of-way line of the South Florida Rail Corridor (SFRC), 3,450 feet long, 22 feet tall (Barrier ID: 86070800SB0000); Constructed in 2006. (Miami-Dade/Broward County Line to south of Hallandale Beach Boulevard)
- Ground mounted noise barrier along the eastern right-of-way line of I-95, 4,390 feet long, 16 feet tall [FDOT ID Numbers: 87270-3409 (I-95 2)]; Constructed in 1988 (Ives Dairy Road to Miami-Dade/Broward County Line).
- Ground mounted noise barrier along the eastern right-of-way line of I-95, 3,440 feet long, 16 feet tall (FDOT ID Numbers: 86070000NB00000); Constructed in 1991 (Miami-Dade/Broward County Line to south of Hallandale Beach Boulevard).
- Ground mounted noise barrier along the eastern right-of-way line of I-95, 3,540 feet long, 16 feet tall (FDOT ID Numbers: 86070000NB0156); Constructed in 1991 (North of Pembroke).
- Ground mounted noise barrier along the eastern right-of-way line of I-95, 1,350 feet long, 16 to 18 feet tall (FDOT ID Numbers: 86070000NB0222); Constructed in 1991 (South of Hollywood Boulevard).
- Ground mounted noise barrier along the eastern right-of-way line of I-95, 1,050 feet long, 22 feet tall; Constructed in 2013, and a shoulder mounted noise barrier along the I-95 northbound outside shoulder, 1,350 long 14-foot-tall; Constructed in 2015 (FDOT ID Numbers: CD20); Constructed in 2015 (North of Hollywood Boulevard to Johnson Street).
- Shoulder mounted noise barrier along the I-95 southbound outside shoulder, 1,800 feet long, 14 feet tall (FDOT ID Numbers: CD4); Constructed in 2015 (North of Johnson Street).
- Shoulder mounted noise barrier along the I-95 southbound outside shoulder, 590 feet long, 8 feet tall (FDOT ID Numbers: CD6); Constructed in 2015 (North of Johnson Street).



3.1 MODEL VALIDATION

Noise measurements were collected at three representative locations representing six monitoring sites (MS1-1 through MS3-2) within the project limits to verify that TNM-predicted existing levels are representative of actual levels along I-95, Hallandale Beach Boulevard, and Pembroke Road; and to confirm that traffic noise is the main, or dominant, source. Noise measurements at these sites were taken on November 5th, 2020. The locations of these monitoring sites are described in **Table 3.1 Appendix B** and depicted in **Figure 3.1** located at the end of **Section 3.2**.

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 *Noise Measurement Handbook - Final Report*, June 2018 (FHWA-HEP-18-065). 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 conducted for three 10-minute intervals at each site with the microphone approximately five feet above the land surface. Weather conditions during the noise measurements were within acceptable ranges based on FHWA's established methodology. Weather data was collected with a handheld Kestrel 3000 wind and weather meter. No precipitation occurred during the noise measurements resulting in dry pavement conditions.

Traffic information, such as the number of passenger cars and trucks, as well as, 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. The dates, times, traffic data, and the measured noise levels are presented in **Table 3.1** in **Appendix B**. Since all noise levels in this report are based on a 1-hour period, the field-recorded traffic volumes were adjusted upward in the table to reflect hourly volumes.

Traffic noise was the dominant noise source at each of the monitoring sites. To verify the computer noise model, the TNM-predicted noise levels for Monitoring Sites MS1-1 through MS3-2 were compared to measured noise levels. When measured noise levels are within +/- 3.0 dB(A) of the computer-predicted levels, the model is considered validated. All six measured noise levels at the three monitoring locations were +/- 3.0 dB(A) of the TNM-predicted levels (see **Table 3.1** in **Appendix B**). 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 along I-95 and arterial roadway (i.e., Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard).

3.2 PREDICTED NOISE LEVELS AND IMPACT ANALYSIS

To facilitate the noise impact analysis, the project was divided into four noise study segments as listed in **Table 3.2**. In addition, 22 noise sensitive areas (i.e., 1W to 22E) were identified along the project corridor that will be potentially impacted by traffic noise associated with the project. These noise sensitive land uses include single and multi-family residences, education facilities, places of worship, recreational areas, and restaurants with outdoor seating.

Each of these areas which are referred to as Noise Study Areas (NSAs) were evaluated for traffic noise impacts as part of this noise study. The locations of these NSAs are depicted in **Figure 3.1** in **Appendix B** located at the end of **Section 3.1**.

Table 3.2 – Noise Study Segments

Segment Number	Segment Limits
1	North of Ives Dairy Road to Hallandale Beach Boulevard
2	Hallandale Beach Boulevard to Pembroke Road
3	Pembroke Road to Hollywood Boulevard
4	Hollywood Boulevard to North of Johnston Street

Existing land uses within the project area were also categorized by FHWA's NAC Activity Categories and are depicted in **Figure 3.2** in **Appendix C**. The locations of the representative sites used in the noise analysis are also presented in **Figure 3.2** and are described in **Table 3.3** in **Appendix D**. **Table 3.3** lists the representative noise sensitive receptors by general area, approximate location, and number of sites represented. Each of the representative receptor sites was given a unique designation (e.g., PL-F1 and PL-S1). The alphanumeric character(s) typically represents the name and location of the noise sensitive receptor site (e.g., "PL" for Park Lake Estates residential community and "F" for first row and "S" for second row noise receptor). The numerical value represents the unique/sequential



receptor site number for that location (e.g., for Park Lake Estates, Receptors Sites PL-F1 through PL-S4 were used to designate the noise sensitive sites within this residential community).

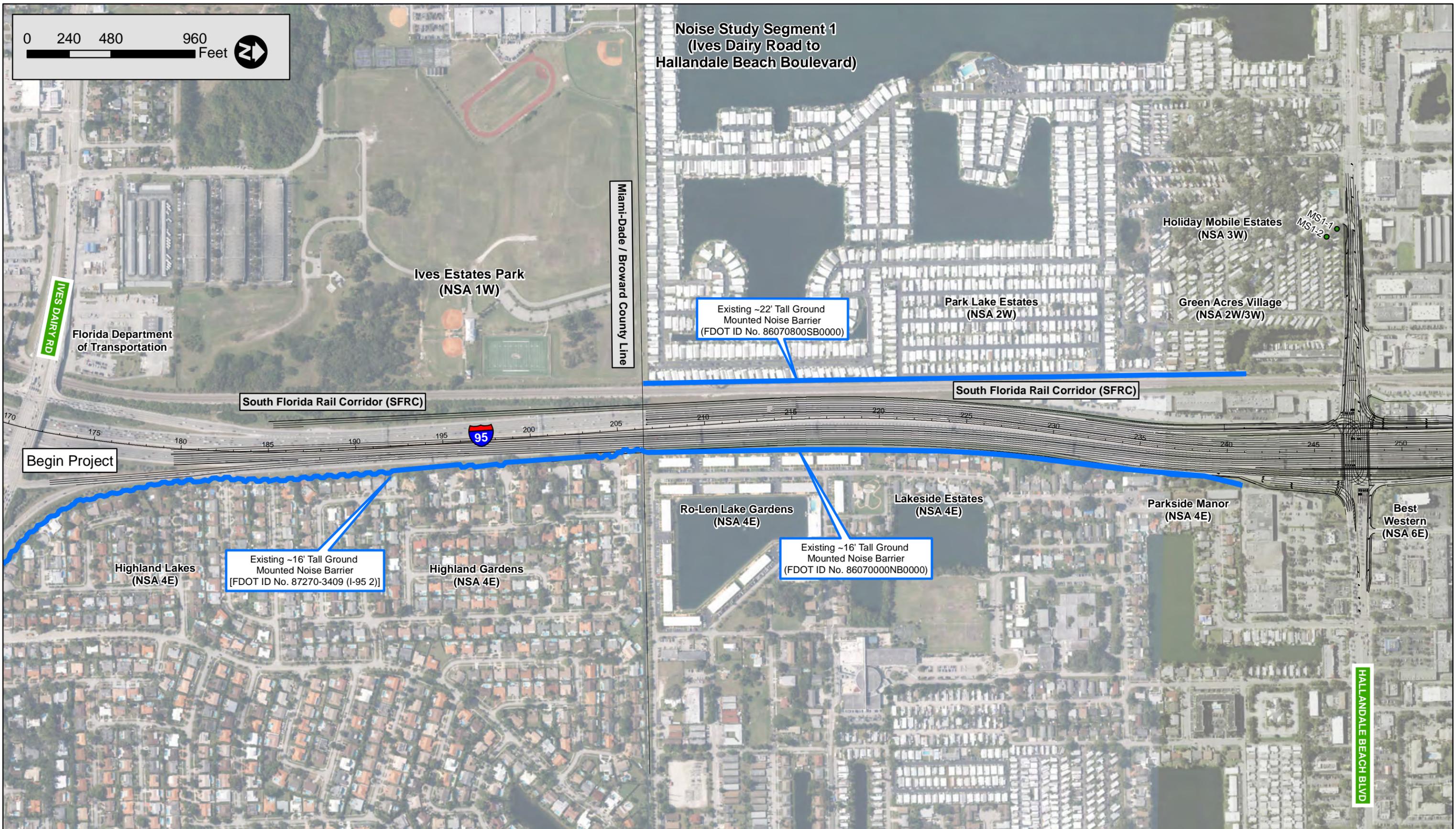
Table 3.3 in **Appendix D** also includes the predicted Existing/No-Build and Design Year (2045) Build Alternative noise levels. Predicted design year (2045) noise levels for the Build Alternative were compared to the NAC and to the predicted existing conditions noise levels to assess potential noise impacts associated with the project. As identified in **Table 3.3** in **Appendix D** and summarized in **Table 3.4** at the end of **Section 3.2**, traffic noise impacts occur and will require consideration of noise abatement measures (i.e., noise barriers). With the recommended Build Alternative, design year (2045) traffic noise levels will approach, meet, or exceed the NAC at 182 residences (NAC B) along the project corridor and at seven non-residential/special land use sites (NACs C and E). The proposed improvements associated with the Build Alternative do not result in any substantial noise increases (i.e., greater than 15 dB(A) over existing levels).

Consideration of noise barriers at each of these impacted residential and special land use sites are summarized in **Section 4.0**. No other noise sensitive sites, including Activity Category D sites, within the project corridor are predicted to experience traffic noise levels that will approach, meet, or exceed the NAC. It should be noted that some developed areas were not evaluated since they do not represent noise sensitive areas or were located beyond the expected area of traffic noise impacts. Only restaurants with outdoor seating represent sensitive commercial land uses; therefore, the restaurants without outdoor seating were not evaluated. Multi-family residential developments without exterior area of use such as patios, balconies, and community pools were not evaluated. Access hallways associated with multi-family residential developments are not considered noise sensitive.

0 240 480 960 Feet



Noise Study Segment 1 (Ives Dairy Road to Hallandale Beach Boulevard)



I-95 (SR 9) PD&E Study from
South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, Florida
FPID No. 436903-1-22-02



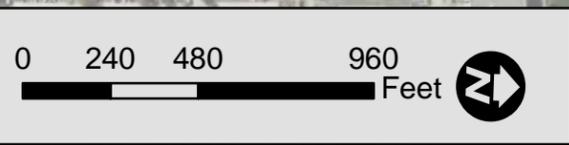
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- Monitoring Sites
- Existing Noise Barriers
- Proposed Improvements



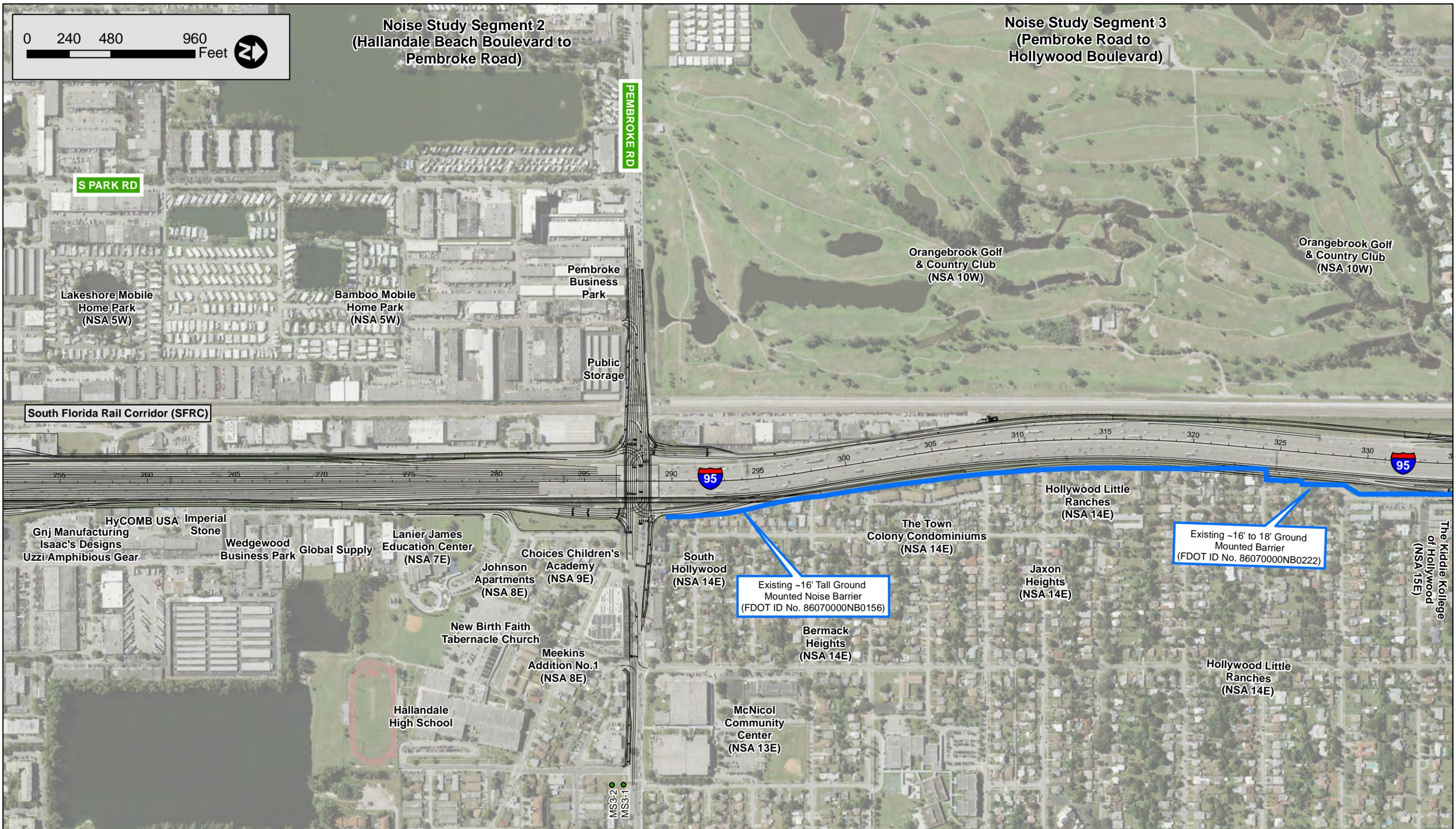
July 2021

Figure 3.1
Noise Study Area (NSA)
Map
Sheet 1 of 3 3-5



Noise Study Segment 2
(Hallandale Beach Boulevard to
Pembroke Road)

Noise Study Segment 3
(Pembroke Road to
Hollywood Boulevard)



I-95 (SR 9) PD&E Study from
South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, Florida
FPID No. 436903-1-22-02



Legend

- Monitoring Sites
- Existing Noise Barriers
- Proposed Improvements

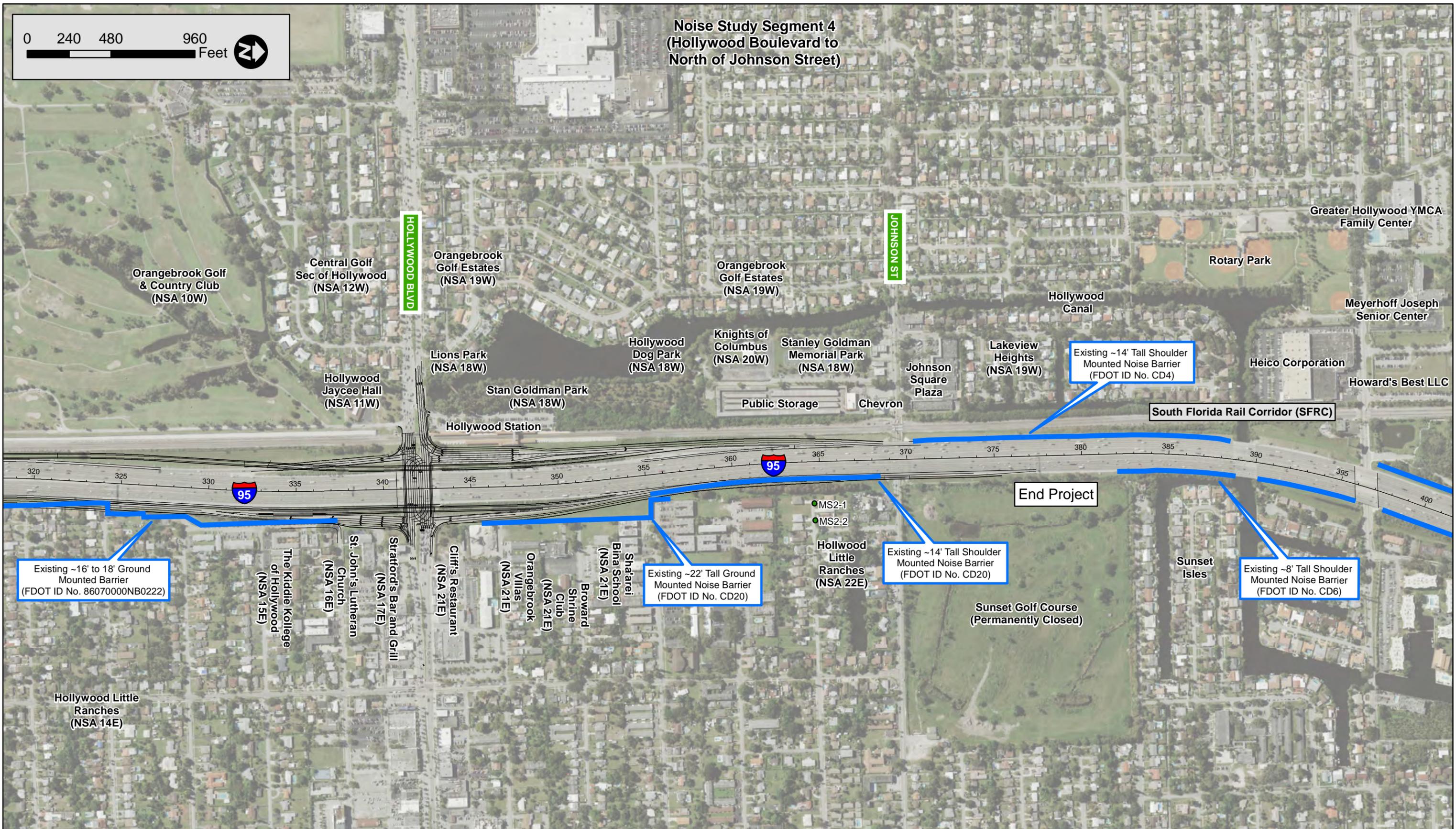


Figure 3.1
Noise Study Area (NSA)
Map
Sheet 2 of 3 3-6

July 2021



**Noise Study Segment 4
(Hollywood Boulevard to
North of Johnson Street)**



Existing ~16' to 18' Ground Mounted Barrier (FDOT ID No. 86070000NB0222)

Existing ~22' Tall Ground Mounted Noise Barrier (FDOT ID No. CD20)

Existing ~14' Tall Shoulder Mounted Noise Barrier (FDOT ID No. CD20)

Existing ~14' Tall Shoulder Mounted Noise Barrier (FDOT ID No. CD4)

Existing ~8' Tall Shoulder Mounted Noise Barrier (FDOT ID No. CD6)

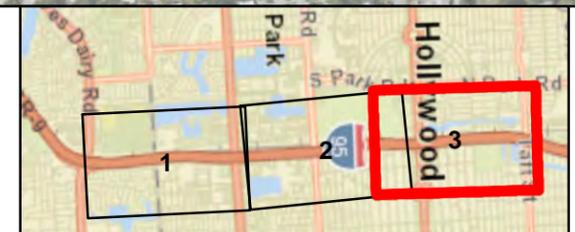
End Project

I-95 (SR 9) PD&E Study from South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820) Broward County, Florida
FPID No. 436903-1-22-02



Legend

- Monitoring Sites
- Existing Noise Barriers
- Proposed Improvements



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**Figure 3.1
Noise Study Area (NSA)
Map
Sheet 3 of 3** 3-7

Table 3.4 - Summary of Traffic Noise Impacts by Noise Study Area

Noise Study Area (NSA) Number	Representative Noise Receptor Site Designation	Noise Abatement Activity Category - Criteria	Impacted by Traffic Noise?	Number of Residential Sites Impacted	Number of Special Land Uses Impacted (Receptor Sites)?	Noise Barriers Potentially Feasible?	Common Noise Environment (CNE) ID / Noise Barrier Analysis Section
Noise Study Segment Number 1 (North of Ives Dairy Road to Hallandale Beach Boulevard) / Noise Study Areas - NSA 1W through NSA 4E							
NSA 1 W (Special Land Use)	Ives Estates Park - West of I-95 between Ives Dairy Road and Miami-Dade/Broward County Line	Recreational NAC C - 66 dB(A)	YES	---	1 (17)	YES	CNE 1-W / Section 4.1
NSA 2W (Residential)	Park Lake Estates and Green Acres Village - West of I-95 between Miami-Dade/Broward County Line and South of Hallandale Beach Boulevard	Residential NAC B - 66 dB(A)	NO	0	---	---	---
NSA 3W (Residential)	Green Acres Village and Holiday Mobile Estates - South of Hallandale Beach Boulevard and West of I-95	Residential NAC B - 66 dB(A)	YES	3	---	Yes (Possibly Insufficient Right-of-Way Along Hallandale Beach Boulevard to Construct Noise Barrier at this Location)	CNE 2-W / Section 4.2
NSA 4E (Residential)	Highland Lakes, Highland Gardens, Ro-Len Lake Gardens, Lakeside Estates, Parkside Manor - East of I-95 between Ives Dairy Road and Hallandale Beach Boulevard	Residential NAC B - 66 dB(A)	YES	58	---	YES (Replacement Noise Barriers)	CNE 3-E / Section 4.3
Noise Study Segment Number 2 (Hallandale Beach Boulevard and Pembroke Road) / Noise Study Areas - NSA 5W through NSA 9E							
NSA 5W (Residential)	Lakeshore and Bamboo Mobile Home Parks - West of I-95 and North of Hallandale Beach Boulevard	Residential NAC B - 66 dB(A)	NO	0	---	---	---
NSA 6E (Special Land Use)	Best Western Hotel Pool - East of I-95 and North of Hallandale Beach Boulevard	Sensitive Commercial NAC E - 71 dB(A)	NO	---	0	---	---
NSA 7E (Special Land Use)	Lanier James Education Center - East of I-95 and South of Pembroke Road	Recreational (Sports Fields) NAC C - 66 dB(A)	NO	---	0	---	---
		Institutional Interior NAC D - 51 dB(A)	NO	---	0	---	---
NSA 8E (Residential)	Johnson Apartments, Meekins Addition No.1, and Carver Heights - East of I-95 and South of Pembroke Road	Residential NAC B - 66 dB(A)	YES	2	---	YES	CNE 4-E / Section 4.4
NSA 9E (Special Land Use)	Choices Children's Academy Playground - East of I-95 and South of Pembroke Road	Recreational NAC C - 66 dB(A)	YES	---	1 (4)	YES	CNE 5-E / Section 4.5
Noise Study Segment Number 3 (Pembroke Road to Hollywood Boulevard) / Noise Study Areas - NSA 10W through NSA 17E							
NSA 10W (Special Land Use)	Orangebrook Golf & Country Club - West of I-95 between Pembroke Road and Hollywood Boulevard	Recreational NAC C - 66 dB(A)	YES	---	1 (6)	YES	CNE 6-W / Section 4.6
NSA 11W (Special Land Use)	Hollywood Jaycee Hall - West of I-95 and South of Hollywood Boulevard	Outdoor Use Area NAC C - 66 dB(A)	YES	---	1 (1)	YES	CNE 7-W / Section 4.7
		Institutional Interior NAC D - 51 dB(A)	NO	---	0	---	---
NSA 12W (Residential)	Central Golf Section of Hollywood Subdivision - West of I-95 and South of Hollywood Boulevard	Residential NAC B - 66 dB(A)	YES	2	---	NO - An Effective Noise Barrier Would Block the Driveway Used to Access the Property (Not Feasible)	---
NSA 13E (Special Land Use)	McNichol Middle School - East of I-95 and North of Pembroke Road	Outdoor Use Area NAC C - 66 dB(A)	NO	---	0	---	---
		Institutional Interior NAC D - 51 dB(A)	NO	---		---	
NSA 14E (Residential)	South Hollywood, Bermack Heights, The Town Colony Condominiums, Jaxon Heights, and Hollywood Little Ranches - East of I-95 between Pembroke Road and Hollywood Boulevard	Residential NAC B - 66 dB(A)	YES	90	---	YES (Replacement Noise Barriers)	CNE 8-E / Section 4.8
NSA 15E (Special Land Use)	The Kiddie College of Hollywood Playground - East of I-95 and South of Hollywood Boulevard	Recreational NAC C - 66 dB(A)	NO	---	0	---	---
NSA 16E (Special Land Use)	St. John's Lutheran Church Playground - East of I-95 and South of Hollywood Boulevard	Recreational NAC C - 66 dB(A)	YES	---	1 (3)	YES	CNE 8-E / Section 4.8
NSA 17E (Special Land Use)	Stratford's Bar and Grill (Outdoor Seating) - East of I-95 and South of Hollywood Boulevard	Sensitive Commercial NAC E - 71 dB(A)	NO	---	0	---	---
Noise Study Segment Number 4 (Hollywood Boulevard to North of Johnston Street) / Noise Study Areas - NSA 18W through NSA 22E							
NSA 18W (Special Land Use)	Lions Park - West of I-95 and North of Hollywood Boulevard	Recreational NAC C - 66 dB(A)	YES	---	1 (1)	NO - An Effective Noise Barrier Would Block the Driveway Used to Access the Property (Not Feasible)	---
	Stan Goldman Park and Hollywood Dog Park - West of I-95 and North of Hollywood Boulevard	Recreational NAC C - 66 dB(A)	YES	---	1 (8)	YES	CNE 9-W / Section 4.9
NSA 19W (Residential)	Orangebrook Golf Estates and Lakeview Heights - West of I-95 and North of Hollywood Boulevard	Residential NAC B - 66 dB(A)	NO	0	---	---	---
NSA 20W (Special Land Use)	Knights of Columbus - West of I-95 and South of Johnston Street	Institutional Interior NAC D - 51 dB(A)	NO	---	0	---	---
NSA 21E (Special Land Uses and Residential)	Cliff's Restaurant (Outdoor Seating) - East of I-95 and North of Hollywood Boulevard	Sensitive Commercial NAC E - 71 dB(A)	NO	---	0	---	---
	Orangebrook Village - East of I-95 and North of Hollywood Boulevard	Residential NAC B - 66 dB(A)	NO	0	---	---	---
	Broward Shrine Club Outdoor Seating - East of I-95 and North of Hollywood Boulevard	Institutional NAC C - 66 dB(A)	NO	---	0	---	---
	Sha'arel Bina School - East of I-95 and North of Hollywood Boulevard	Institutional Interior NAC D - 51 dB(A)	NO	---	0	---	---
NSA 22E (Residential)	Hollywood Little Ranches (North of Hollywood Boulevard)	Residential NAC B - 66 dB(A)	YES	27	---	YES (Replacement Noise Barriers)	CNE 10-E / Section 4.10
Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)				182	---	---	---
Total Number of Non-Residential / Special Land Use Sites Equal to or Greater than the Noise Abatement Criteria (NAC)				---	7	---	---



4.0 NOISE ABATEMENT ANALYSIS

The FDOT noise policy requires that the reasonableness and feasibility of noise abatement be considered when the FHWA NAC is approached, met, 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. NSAs were divided into common noise environments (CNEs) to facilitate the evaluation of noise barriers at the impacted receptor sites along the project corridor that were described in **Section 3.2** and in **Table 3.4**. 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, 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 reasonable cost of a noise barrier 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). As presented **Table 3.3** in **Appendix D** and **Table 3.4**, 10 separate CNEs were used to assess noise barriers for the noise sensitive sites that approach, meet, or exceed the NAC. Each CNE was given a unique designation (e.g., 1-W) and identifies the side of the road in which they are located (e.g., W - West). The analysis of noise barriers and recommendations are summarized by each of the four noise study segments (NSA 1 through 4) and by CNE in **Section 4.1** through **Section 4.4**. Due to the number of tables associated with the noise barrier analysis (**Tables 4.1.1.1** through **4.4.2.1**), these have been included in **Appendix E**. The locations and limits of the noise barriers (both recommended and not recommended) are depicted on **Figure 3.2** in **Appendix C**.



4.1 NORTH OF IVES DAIRY ROAD TO HALLANDALE BEACH BOULEVARD (SEGMENT 1)

Noise Study Segment 1 extends along I-95 from Ives Dairy Road to Hallandale Boulevard and includes four NSAs, 1W through 4E (see **Figure 3.1, Sheet 1 of 3**).

- NSA 1W represents a regional park (i.e., Ives Estates Park) located west of I-95.
- NSA 2W represents residences within Park Lake Estates and Green Acres Village communities located west of I-95.
- NSA 3W represents residences with Green Acres Village and Holiday Mobile Estates communities located south of Hallandale Beach Boulevard.
- NSA 4E represents residences within Highland Lakes, Highland Gardens, Ro-Len Lake Gardens, Lakeside Estates, and Parkside Manor communities located east of I-95.

Noise sensitive sites in three of the four NSAs in Segment 1 (i.e., 1W, 3W, and 4E) are predicted to be impacted by design year traffic noise levels (see **Table 3.4**). The evaluation of noise barriers at these NSAs is presented in **Sections 4.1.1, 4.1.2, and 4.1.3**, respectively.

Evaluation of noise barriers for NSA 2W was not warranted. None of the residences with Park Lake Estates and Green Acres Village communities west of I-95 were predicted to be impacted by design year traffic noise levels associated with the project. The lack of noise impacts to these communities is attributed to an existing 22-foot-tall noise barrier that is located along the western right-of-way line of the SFRC (FDOT Barrier Number: 86070800SB0000.). This noise barrier was constructed in 2007 to abate traffic noise from a previous I-95 widening project and will not be physically impacted by the current project improvements.

4.1.1 COMMON NOISE ENVIRONMENT CNE 1-W (IVES ESTATES PARK/NSA 1W)

Common Noise Environment CNE 1-W encompasses the exterior areas associated with the Ives Estates Park located ~185 feet west of I-95 between Ives Dairy Road and the Miami-Dade/Broward County Line (see **Figure 3.2, Sheet 1 in Appendix C**). Ives Estates Park is a large regional park located west of the SFRC and includes several sports fields including soccer fields, football stadium, baseball field. There is a 22-foot-tall existing noise barrier (FDOT ID Number: 86070800SB0000) just north of Ives Estates Park (see **Figure 3.2, Sheet 1 in Appendix C**). The predicted design year (2045) traffic noise levels with the Build Alternative within Ives Estates Park



ranged from 60.7 to 72.7 dB(A), averaging 0.3 dB(A) higher than existing levels. Fifteen of the receptor sites modeled are predicted to be impacted by design year (2045) noise levels (see **Table 3.3** in **Appendix D**). Therefore, noise barriers were considered as a noise abatement measure at this location.

Four ground mounted conceptual noise barrier designs of varying dimensions were evaluated along the western right-of-way line of the SFRC to reduce traffic noise levels at this location. All four would connect to the existing 22-foot-tall noise barrier to the north of the park (i.e., FDOT Barrier Number: 86070800SB0000). The results of the noise barrier analysis are summarized in **Table 4.1.1.1**. Two of the four conceptual noise barrier designs meet the minimum noise reduction design goal of 7 dB(A) for at least one benefited site. Of the four conceptual barrier designs evaluated, CD 1W-4 is the lowest cost conceptual barrier design that benefits 100 percent of the impacted area. Conceptual barrier design CD 1W-4 represents a 22-foot-tall ground mounted noise barrier that extends approximately 2,740 feet, from Station 179+20 to Station 206+60. This barrier would provide an average reduction of 7.8 dB(A) and a maximum noise reduction of 10.3 dB(A). The estimated construction cost of this conceptual barrier design is \$1,782,000.

The FDOT's Special Land Use Methodology was used to determine if conceptual noise barrier design CD 1W-4 would meet the reasonable cost criteria. For CD 1W-4 to meet the cost criteria requires a daily usage rate of 2,507 person-hours per day of the areas being benefited by this conceptual noise barrier design (see **Table 4.1.1-2**). It is not reasonable to assume that this area would experience this level of use on a typical day. The use of this area is intermittent and limited to the eastern side of the park, which is mainly passive recreation. Based on the analysis performed, noise barriers are not considered reasonable at this location since they do not meet FDOT's required cost criteria. Therefore, noise barriers are not recommended for further consideration at this location during the project's design phase.



4.1.2 COMMON NOISE ENVIRONMENT CNE 2-W (GREEN ACRES VILLAGE AND HOLIDAY MOBILE ESTATES/NSA 3W)

Common Noise Environment CNE 2-W encompasses the residences associated with Green Acres Village and Holiday Mobile Estates located on the west side of I-95 / SFRC and south side of Hallandale Beach Boulevard and east of South Park Road (see **Figure 3.2, Sheet 2** in **Appendix C**). The predicted design year (2045) traffic noise levels with the Build Alternative within these communities ranged from 58.3 to 67.2 dB(A), averaging 0.2 dB(A) higher than existing levels. Three residences within Green Acres Village are predicted to be impacted by design year (2045) noise levels (see **Table 3.3** in **Appendix D**). Therefore, noise barriers were considered as a noise abatement measure at this location. There are no existing noise barriers along this segment of Hallandale Beach Boulevard.

Four ground mounted conceptual noise barrier designs of varying dimensions were evaluated along the southern right-of-way line of Hallandale Beach Boulevard to reduce traffic noise levels at these impacted residences. The results of the noise barrier analysis are summarized in **Table 4.1.2.1**. All four conceptual noise barrier designs evaluated meet the minimum noise reduction design goal of 7 dB(A) for at least one benefited residence and meet the reasonable cost criteria of equal to or less than \$42,000 per benefited receptor site. Of the four conceptual noise barrier designs evaluated, CD 2W-2 represents the optimal noise barrier design at this location. However, there appears to be insufficient right-of-way to construct a noise barrier along the southside of Hallandale Beach Boulevard. Therefore, noise barriers are not considered feasible at this location. However, noise barriers are recommended for further evaluation during the project's design phase when additional design information including topographical survey would be available to confirm the available right-of-way at this location.

CD 2W-2 represents the optimal noise barrier design at this location. CD 2W-2 includes two 10-foot-tall ground mounted noise segments both located along Hallandale Beach Boulevard southern right-of-way line. Segment 1 is located west of the entrance road to Green Acres Village and extends 590 feet to the entrance road to Holiday Mobile Estates. Segment 2 located to the east of the entrance road to Green Acres Village and extends 170 feet. This conceptual



noise barrier design would benefit 20 residences including the three impacted residences within the Green Acres Village community. The optimized noise barrier design at this location would provide an average noise reduction of 6.8 dB(A) at the benefited receptor sites with a maximum reduction of 8.8 dB(A). The estimated construction cost of this conceptual barrier design is \$228,000 or \$11,400 per benefited receptor site. Additional noise barrier analysis will be performed during the project's design phase to assess the reasonableness and feasibility of a noise barrier at this location including Conceptual Noise Barrier Design CD 2W-2.

4.1.3 COMMON NOISE ENVIRONMENT CNE 3-E (HIGHLAND GARDENS AND PARKSIDE MANOR COMMUNITIES/NSA 4E)

Common Noise Environment CNE 3-E encompasses the single and multi-family residences associated with Highland Lakes, Highland Gardens, Ro-Len Lake Gardens, Lakeside Estates, and Parkside Manor communities located on the east side of I-95 between Ives Dairy Road and Hallandale Beach Boulevard (see **Figure 3.2, Sheets 1 and 2 in Appendix C**). The residences in these community are currently being benefited by two existing ~16-foot continuous ground mounted noise barrier segments (see **Figure 3.1, Sheets 1**). These noise barriers are located along I-95 eastern right-of-way line extending from north of Ives Dairy Road to south of Hallandale Beach Boulevard [FDOT ID Numbers: 87270-3409 (I-95 2) and 86070000NB00000]. However, the proposed project improvements will physically impact these existing noise barriers and require certain segments to be removed including a 200-foot long segment in the vicinity of the Miami-Dade/Broward County Line (Station ~204+80 to ~206+80) and the last 1,000 feet of the northern segment (Station ~231+00 to ~241+00). The remaining segments of these two existing noise barriers will not be affected and will remain in place.

With these two noise barrier segments removed, the predicted design year (2045) noise levels for the Build Alternative within these communities ranged from 58.3 to 77.9 dB(A), approximately 3.6 dB(A) higher than existing levels. Fifty eight residences within these communities are predicted to be impacted by design year (2045) noise levels (see **Table 3.3 in Appendix D**). Therefore, replacement and supplemental noise barriers were evaluated as a noise abatement measure at this location.



The results of the analysis to determine the replacement noise barrier system for these two barrier segments physically impacted by the project are summarized in **Table 4.1.3.1**. For the 200-foot long segment of the existing noise barrier impacted by the project, it recommended that it be replaced in-kind with a 16-foot-tall ground mounted noise barrier between Stations 204+80 to ~206+80 (i.e., Conceptual Noise Barrier Design CD 3E-1S). The recommended replacement noise barrier would benefit 2 of the 11 impacted residences and would provide an average noise reduction of 9.6 dB(A) at the two benefited receptor sites with a maximum reduction of 12.3 dB(A). The estimated construction cost of this conceptual noise barrier design is \$96,000 or \$48,000 per benefited receptor site. Since this is a replacement noise barrier, the reasonable cost criteria of equal to or less than \$42,000 per benefited receptor site is not applicable.

For the 1,000-foot long segment of the existing noise barrier impacted by the project, four conceptual shoulder mounted noise barrier designs were evaluated as a replacement noise barrier and to reduce traffic noise levels at the 47 impacted residences in this area. Ground mounted noise barriers were not considered feasible at this location due to insufficient available right-of-way. In addition, a ground mounted noise barrier would be less effective than a shoulder mounted noise barrier since the travel lanes in some areas are higher than the existing right-of-way line. All four conceptual noise barrier designs evaluated meet the minimum noise reduction design goal of 7 dB(A) for at least one impacted residence. Since this is a replacement noise barrier, the reasonable cost criteria of equal to or less than \$42,000 per benefited receptor site is not applicable. Of the conceptual noise barrier designs evaluated, CD 3E-4N represents the optimal noise barrier design at this location since it maximizes the amount of noise reduction to this community.

Conceptual Noise Barrier Design CD 3E-4N represents two shoulder mounted noise barriers. The first shoulder mounted noise barrier is intended to replace the existing 16-foot-tall ground mounted and would be 14-feet tall starting at Station 231+00 and continuing to Station 241+80 for a length of 1,080 feet. The second shoulder barrier represents a supplemental noise barrier to be located along I-95 northbound off ramp to Hallandale Beach Boulevard. The second shoulder mounted noise barrier would have a height of 8-feet and would extend from Station 236+00 to Station 242+00 for a length of 600 feet. An 8-foot-tall shoulder mounted noise barrier is the maximum allowable height on MSE walls and bridges. The recommended noise barrier would benefit 54 residences, including 43 of the



47 impacted residences, and would provide an average noise reduction of 8.1 dB(A) at benefited receptor sites with a maximum reduction of 12.1 dB(A). The estimated construction cost of this conceptual noise barrier design is \$597,600 or \$11,067 per benefited receptor site.

Both Conceptual Noise Barrier Design CD 3E-1S and CD 3E-4N are recommended for further consideration and public input during the project's design phase as replacement noise barriers. The final decisions on noise barrier dimensions are made during the project's design phase. During the design phase, an engineering constructability review is conducted to confirm that the noise barrier is feasible and support for noise barriers from the benefited noise sensitive sites is determined. Note that any of the 14-foot tall shoulder mounted noise barriers recommended for construction on a retaining or MSE wall will need approval in writing by the State Structures Design Engineer in accordance with FDOT's noise policy.

4.2 HALLANDALE BEACH BOULEVARD AND PEMBROKE ROAD (SEGMENT 2)

Noise Study Segment 2 extends along I-95 from Hallandale Beach Boulevard to Pembroke Road and includes five NSAs, 5W through 9E (see **Figure 3.1, Sheet 2**).

- NSA 5W represents residences within Lakeshore and Bamboo Mobile Home Parks (NSA 5W) west of I-95.
- NSA 6E represents a pool area associated with the Best Western Hotel located east of I-95.
- NSA 7E represents Linear James Education Center located east of I-95.
- NSA 8E represent residences with Johnson Apartments and Meekins Addition No. 1 subdivision located east of I-95.
- NSA 9E represents a playground associated with Choices Children's Academy located east of I-95.

Noise sensitive sites in two of the five NSAs in Segment 2 (i.e., 8E and 9E) are predicted to be impacted by design year traffic noise levels (see **Table 3.4**). The evaluation of noise barriers at these NSAs is presented in **Sections 4.2.1** and **4.2.2**, respectively.

Evaluation of noise barriers for 5W, 6E, and 7E were not warranted. None of the noise receptor sites associated with the 5W, 6E, and 7E were not predicted to be impacted by design year noise levels associated with the project.



4.2.1 COMMON NOISE ENVIRONMENT CNE 4-E (MEEKINS ADDITION NO.1 SUBDIVISION/NSA 8E)

Common Noise Environment CNE 4-E encompasses the two multi-family residences within the Meekins Addition No. 1 subdivision that are located on the east side of I-95 and south of Pembroke Road (see **Figure 3.2, Sheet 5** in **Appendix C**). The predicted design year (2045) traffic noise levels with the Build Alternative at these two residences is 67.0 dB(A), averaging -3.1 dB(A) lower than existing levels. The lower traffic noise levels are attributed to the elevated sections of the proposed northbound collector distributor (CD) road on a MSE wall that block some of the I-95 mainline traffic noise. These residences (i.e., Receptor Site FA-M3) are also predicted to experience traffic noise levels that will approach, meet, or exceed the NAC of 67 dB(A) for residential land uses (see **Table 3.3** in **Appendix D**). Therefore, noise barriers were considered as a noise abatement measure at this location. There are no existing noise barriers along this roadway segment.

Four ground mounted conceptual noise barrier designs of varying dimensions were evaluated at this location. The results of the noise barrier analysis are summarized in **Table 4.2.1.1**. None of the four conceptual noise barrier designs evaluated meet the minimum noise reduction design goal of 7 dB(A) for at least one benefited residence or the reasonable cost criteria of equal to or less than \$42,000 per benefited receptor site. The maximum reduction of 6.2 dB(A) is associated with Conceptual Noise Barrier Design CD 4E-5 with a cost per benefited receptor site of \$393,300. Based on the noise barrier analysis performed, noise barriers are not considered feasible at this location since they do not meet FDOT's required noise abatement design goal or the reasonable cost criteria. Therefore, noise barriers are not recommended for further consideration at this location.



4.2.2 COMMON NOISE ENVIRONMENT CNE 5-E (CHOICES CHILDREN'S ACADEMY /NSA 9E)

Common Noise Environment CNE 5-E encompasses the impacted playground area of the Choices Children's Academy located east of I-95 and south of Pembroke Road (see **Figure 3.2, Sheet 5** in **Appendix C**).

The predicted design year (2045) traffic noise levels with the Build Alternative within this playground ranged from 67.1 to 68.6 dB(A), averaging 1.5 dB(A) lower than existing levels. The lower traffic noise levels are attributed to the proposed concrete barrier walls versus guard rail along the northbound off ramp to Pembroke Road, the northbound CD road, and the outside shoulder of I-95 northbound lanes that block some of the I-95 mainline traffic noise. All four of the receptor sites modeled at this location (CCA-R1.1 through CCA-R1.4) representing the entire playground area are predicted to be impacted by design year (2045) noise levels (see **Table 3.3** in **Appendix D**). Therefore, noise barriers were considered as a noise abatement measure at this location. There are no existing noise barriers along this roadway segment.

Four ground mounted conceptual noise barrier designs of varying dimensions were evaluated at this location. The results of the noise barrier analysis are summarized in **Table 4.2.2.1**. Although all four conceptual noise barrier designs evaluated meet the minimum noise reduction design goal of 7 dB(A) for at least one benefited residence, none provide benefit to the entire playground. CD 5E-4 represents the optimized cost conceptual barrier design at this location consisting of a 22-foot tall ground mounted noise barrier along I-95 eastern right-of-way line, 8-foot and 14-foot tall shoulder mounted noise barriers along the northbound off ramp to Pembroke Road, and an 8-foot tall shoulder mounted noise barrier along the outside shoulder of I-95 northbound lanes. This conceptual barrier design benefits approximately 75 percent of the impacted playground area, would provide an average reduction of 6.7 dB(A) and a maximum noise reduction of 8.2 dB(A). The estimated construction cost of this conceptual barrier design is \$933,600.

FDOT's Special Land Use Methodology was used to determine if conceptual design noise barrier design CD 5E-4 would meet the reasonable cost criteria. For CD 5E-4 to meet the cost criteria requires a daily usage rate of 1,312 person-hours per day of the school's playground benefited by the conceptual barrier designs (see **Table 4.2.2-2**). Due to the small size of the playground (i.e., ~0.1 acres), it is



not reasonable to assume that these areas would experience this level of use on a typical day. Based on the analysis performed, noise barriers are not considered reasonable at this location since they do not meet FDOT's required cost criteria. Therefore, noise barriers are not recommended for further consideration at this location during the project's design phase.

4.3 PEMBROKE ROAD TO HOLLYWOOD BOULEVARD (SEGMENT 3)

Noise Study Segment 3 extends along I-95 from Pembroke Road to Hollywood Boulevard and includes eight NSAs, 10W through 17E (see **Figure 3.1, Sheet 1**).

- NSA 10W represents a golf course associated with Orangebrook Golf and Country Club located west of I-95.
- NSA 11W represents the Hollywood Jaycee Hall located west of I-95.
- NSA 12W represents residences within Central Golf Section of Hollywood subdivision located west of I-95 and south of Hollywood Boulevard.
- NSA 13E represents the McNichol Middle School located east of I-95 and north of Pembroke Road.
- NSA 14E represents the residences within the South Hollywood, Bermack Heights, The Town Colony Condominiums, Jaxon Heights, and Hollywood Little Ranches communities located east of I-95.
- NSA 15E represents the Kiddie Kollege of Hollywood located east of I-95.
- NSA 16E represents St. John's Lutheran Church located east of I-95.
- NSA 17E represents the outdoor seating associated with the Stratford's Bar and Grill located east of I-95 and south of Hollywood Boulevard.

Noise sensitive sites in five of the eight NSAs in Segment 3 (i.e., 10W, 11W, 12W, 14E, and 16E) are predicted to be impacted by design year traffic noise levels (see **Table 3.4**). The evaluation of noise barriers for NSAs 10W, 11W, and 14E/16E is presented in **Sections 4.3.1, 4.3.2, and 4.3.3**, respectively. The noise barriers evaluated for NSA 14E included NSA 16E (St. John's Lutheran Church) due to the proximity of each of these NSAs. Noise barriers were not evaluated for the impacted residences (i.e., CG-F2 and CG-F3) associated with NSA 12W (i.e., Central Golf Section of Hollywood subdivision) since noise barriers are not considered feasible. An effective noise barrier at this location would block access to the residence and to Calle Largo Drive.



Evaluation of noise barriers for 13E, 15E, and 17E were not warranted. None of the noise receptor sites associated with the 13E, 15E, and 17E were not predicted to be impacted by design year noise levels associated with the project.

4.3.1 COMMON NOISE ENVIRONMENT CNE 6-W (ORANGEBROOK GOLF & COUNTRY CLUB/NSA 10W)

Common Noise Environment CNE 6-W encompasses the noise sensitive areas of a golf course (i.e., tees and greens) associated with the Orangebrook Golf & Country Club located west of the SFRC and ~160 feet to ~320 feet west of I-95. The golf course extends from Pembroke Road to Hollywood Boulevard (see **Figure 3.2, Sheets 4 and 6 in Appendix C**). Five greens (i.e., Nos. 5, 6, 7, 8, and 10) and six tees (Nos. 5,6,7,8,10, and 11) are adjacent to SFRC/I-95. There are no existing noise barriers along this roadway segment.

The predicted design year (2045) traffic noise levels with the Build Alternative at the closest greens and tees associated with the golf course ranged from 58.3 to 67.5 dB(A), averaging 2.1 dB(A) lower than existing levels (see **Table 3.3 in Appendix D**). The lower traffic noise levels are attributed to the elevated sections of the proposed southbound CD road on a MSE wall that block some of the I-95 mainline traffic noise.

Six of the receptor sites modeled are predicted to be impacted by design year (2045) noise levels (see **Table 3.3 in Appendix D**). Two of receptors sites [OCG-Tee 10(W) and OCG-Tee 1(E)] are located at the south end of the golf course. Four of the receptor sites [OCG-Green 7(W) and 7(E) and OCG-Tee 8W and 8 (E)] are located at the north end of the golf course. Therefore, noise barriers were considered at both the south and north ends of the golf course. The results of the noise barrier analysis for these two areas are summarized in **Table 4.3.1.1**.

For the south end of the golf course, four conceptual noise barrier designs were evaluated to reduce traffic noise levels at the two impacted receptor sites [OCG-Tee 10(W) and OCG-Tee 1(E)]. Two of these conceptual noise barrier designs evaluated (CD 6W-3S and CD 6W-4S) meet the minimum noise reduction design goal of 7 dB(A) for at least one benefited site. CD 6W-4S represents the lowest cost conceptual barrier design that benefits 100 percent of the impacted area. Conceptual barrier design CD 6W-4S represents a 22-foot-tall ground mounted noise barrier that extends 260 feet, from Station 289+40 to Station 292+00. This barrier would provide an average reduction of 6.2 dB(A) and a maximum noise



reduction of 7.1 dB(A). The estimated construction cost of this conceptual barrier design is \$171,600.

For the north end of the golf course, four conceptual noise barrier designs were also evaluated to reduce traffic noise levels at the four impacted receptor sites [OCG-Green 7(W) and 7(E) and OCG-Tee 8W and 8 (E)]. All four the conceptual noise barrier designs evaluated (CD 6W-1N through CD 6W-4N) meet the minimum noise reduction design goal of 7 dB(A) for at least one benefited site. CD 6W-1N represents the lowest cost conceptual barrier design that benefits 100 percent of the impacted area. Conceptual barrier design CD 6W-1N represents a 16-foot-tall ground mounted noise barrier that extends 460 feet, from Station 334+00 to Station 338+60. This barrier would provide an average reduction of 6.7 dB(A) and a maximum noise reduction of 7.7 dB(A). The estimated construction cost of this conceptual barrier design is \$220,800.

FDOT's Special Land Use Methodology was used to determine if conceptual design noise barrier designs CD 6W-4S and/or CD 6W-1N would meet the reasonable cost criteria. For CD 6W-4S and CD 6W-1N to meet the cost criteria requires a daily usage rate of 241 and 310 person-hours per day of the tees and greens benefited by the conceptual barrier designs, respectively (see **Tables 4.3.1-2 and 4.3.1.3**). It is not reasonable to assume that these areas would experience this level of use on a typical day for a number of reasons; the use of the golf course is intermittent, the number of tees and green being benefited is limited, and a limited number of golfers (i.e., typically one to four) using these areas (i.e., ~15 minute per hole). Based on the analysis performed, noise barriers are not considered reasonable at this location since they do not meet FDOT's required cost criteria. Therefore, noise barriers are not recommended for further consideration at this location during the project's design phase.

4.3.2 COMMON NOISE ENVIRONMENT CNE 7-W (HOLLYWOOD JAYCEE HALL/NSA 11W)

Common Noise Environment CNE 7-W encompasses the impacted outdoor use area (i.e., two park benches) associated with the Hollywood Jaycee Hall located on the west side of I-95 and the SFRC and south of Hollywood Boulevard (see **Figure 3.3, Sheet 6 in Appendix C**). The predicted design year (2045) traffic noise levels with the Build Alternative at the two park benches on the north side of the building is 66.7 dB(A), averaging 0.3 dB(A) higher than existing levels. These park benches (i.e., Receptor Site HJ-2C) are predicted to experience traffic noise levels



that will approach, meet, or exceed the NAC of 67 dB(A) for recreational land uses. Therefore, noise barriers were considered as a noise abatement measure at this location. There are no existing noise barriers along this roadway segment.

Two ground mounted conceptual noise barrier designs of varying dimensions were evaluated at this location. The results of the noise barrier analysis are summarized in **Table 4.3.2.1**. Only one of the two conceptual noise barrier designs (CD 7W-2) meet the minimum noise reduction design goal of 7 dB(A) for at least one benefited site and benefits 100 percent of the impacted area. Conceptual noise barrier design CD 7W-2 represents a 22-foot-tall ground mounted noise barrier that extends 280 feet, from Station 337+80 to Station 340+60. This barrier would provide an average reduction of 7.2 dB(A) and a maximum noise reduction of 7.2 dB(A). The estimated construction cost of this conceptual barrier design is \$184,800.

FDOT's Special Land Use Methodology was used to determine if conceptual design noise barrier design CD 7W-2 would meet the reasonable cost criteria. For CD 7W-2 to meet the cost criteria requires a daily usage rate of 260 person-hours per day using the benches benefited by this conceptual barrier designs (see **Table 4.3.2-2**). Due to the intermittent use and limited number of people that can use the two park benches at any one time (i.e., equal to or less than eight), it is not reasonable to assume that they would experience this level of use on a typical day. Based on the analysis performed, noise barriers are not considered reasonable at this location since they do not meet FDOT's required cost criteria. Therefore, noise barriers are not recommended for further consideration at this location during the project's design phase.

4.3.3 COMMON NOISE ENVIRONMENT CNE 8-E (SOUTH HOLLYWOOD, BERMACK HEIGHTS, THE TOWN COLONY CONDOMINIUMS, JAXON HEIGHTS, AND HOLLYWOOD LITTLE RANCHES COMMUNITIES/NSA 14E)

Common Noise Environment CNE 8-E encompasses the impacted single and multi-family residences within the South Hollywood, Bermack Heights, The Town Colony Condominiums, Jaxon Heights, and Hollywood Little Ranches communities located on the east side of I-95 and between Pembroke Road and Hollywood Boulevard. CNE 8-E also includes the playground area St. John's Lutheran Church. These residential areas and playground are currently being benefited by two existing ~16-foot continuous ground mounted noise barrier



segments (see **Figure 3.2, Sheets 5 and 6**). These noise barriers are located along I-95 eastern right-of-way line extending from north of Pembroke Road to south of Hollywood Boulevard [FDOT ID Numbers: 86070000NB0156 and 86070000NB0222]. The proposed project improvements will physically impact these existing noise barriers. The existing noise barrier segment from Station 298+30 to Station 337+40 is expected to be removed. The southern segment of the 16-tall noise barrier along the on ramp from Pembroke Road will not be affected and will remain in place (Station 298+50 to 298+30).

With the existing noise barrier segment removed, the predicted design year (2045) noise levels for the Build Alternative within these residential communities ranged from 60.4 to 75.1 dB(A), approximately 2.4 dB(A) higher than existing levels. Ninety residences within these communities are predicted to be impacted by design year (2045) noise levels (see **Table 3.3 in Appendix D**). In addition, the predicted design year (2045) traffic noise levels within the playground associated with St. John's Lutheran Church ranged from 66.0 to 69.2 dB(A), averaging the same as the existing levels of 67.8 dB(A). All three of the receptor sites representing the entire playground area of modeled at this location (SL-1C through SL_3C) are predicted to be impacted by design year (2045) noise levels (see **Table 3.3 in Appendix D**). Therefore, replacement and supplemental noise barriers were evaluated as a noise abatement measure at this location.

The results of the analysis to determine the replacement noise barrier system for the noise barrier segment physically impacted by the project are summarized in **Table 4.3.3.1**. Four conceptual noise barrier designs were evaluated as a replacement barrier system and to reduce traffic noise levels at the 90 impacted residences and school playground. Ground mounted noise barriers were not considered feasible at this location due to insufficient available right-of-way. In addition, a ground mounted noise barrier would be less effective than a shoulder mounted noise barrier since the travel lanes in some areas are higher than the existing right-of-way line. All four conceptual noise barrier designs evaluated meet the minimum noise reduction design goal of 7 dB(A) for at least one impacted residence. Since this is a replacement noise barrier, the reasonable cost criteria of equal to or less than \$42,000 per benefited receptor site is not applicable. Of the conceptual noise barrier designs evaluated, CD 8E-3 represents the optimal noise barrier design since it maximizes the amount of noise reduction to the impacted noise sensitive sites.



Conceptual Noise Barrier Design CD 8E-3 represents a continuous 14-foot-tall shoulder mounted noise barrier extending 4,220 feet from Station 298+30 to Station 340+50. The first three segments of CD 8E-3 are intended to replace the existing 16-foot-tall ground mounted. The second segment was used to evaluate if a segment of the existing 16-foot-tall noise barrier between Stations 326+50 and 333+50 should remain or be removed. With CD 8E-3, this segment of the existing noise barrier would be removed. The last shoulder mounted barrier segment represents a supplemental noise barrier to be located along I-95 northbound off ramp to Hollywood Beach Boulevard. The recommended noise barrier would benefit 79 residences, including 74 of the 90 impacted residences, and would provide an average noise reduction of 7.9 dB(A) at benefited receptor sites with a maximum reduction of 11.1 dB(A). In addition, it would provide incidental benefit to St. John's Lutheran Church playground. The estimated construction cost of this conceptual noise barrier design is \$1,722,400 or \$22,435 per benefited receptor site.

Conceptual Noise Barrier Design CD 8E-3 is recommended for further consideration and public input during the project's design phase as replacement noise barrier system. The final decisions on noise barrier dimensions are made during the project's design phase. During the design phase, an engineering constructability review is conducted to confirm that the noise barrier is feasible and support for noise barriers from the benefited noise sensitive sites is determined. Note that any of the 14-foot tall shoulder mounted noise barriers recommended for construction on a retaining or MSE wall will need approval in writing by the State Structures Design Engineer in accordance with FDOT's noise policy.

4.4 HOLLYWOOD BOULEVARD TO NORTH OF JOHNSTON STREET (SEGMENT 4)

Noise Study Segment 4 extends along I-95 from Hollywood Boulevard to north of Johnson Street and includes five NSAs, 18W through 22E (see **Figure 3.1, Sheet 3**).

- NSA 18W represents Lions Park, Stan Goldman Park and Hollywood Dog Park located west of I-95 and north of Hollywood Boulevard.
- NSA 19W represents the residences with Orangebrook Golf Estates and Lakeview Heights west of I-95.
- NSA 20W represents Knights of Columbus meeting hall located west of I-95.



- NSA 21E represents Cliff's Restaurant, Broward Shrine Club, Sha'arel Bina School, and residences associated with Orangebrook Village located west of I-95 and north of Hollywood Boulevard.
- NSA 22E represents the residences within the Hollywood Little Ranches communities.

Noise sensitive sites in two of the five NSAs (i.e., 18W and 22E) in Segment 4 are predicted to be impacted by design year traffic noise levels (see **Table 3.4**). The evaluation of noise barriers at these NSAs except for Lions Park is presented in **Sections 4.4.1** and **4.4.2**, respectively. Noise barriers were not considered feasible at Lions Park within NSA 8W located adjacent to Hollywood Boulevard. An effective noise barrier at this location would block access to the park.

Evaluation of noise barriers for 19W, 20W, and 21E were not warranted. None of the noise receptor sites associated with the 19W, 20W, and 21E were not predicted to be impacted by design year noise levels. The lack of noise impacts to NSA 21E noise sensitive receptors is attributed to an existing 20-foot-tall noise barrier located along I-95 eastern right-of-way line (FDOT Barrier Number: CD20). This noise barrier was constructed in 2015 to abate traffic noise from a previous I-95 widening project and will not be physically impacted by the current project improvements.

4.4.1 COMMON NOISE ENVIRONMENT CNE 9-W (STAN GOLDMAN AND HOLLYWOOD DOG PARKS/NSA 18W)

Common Noise Environment CNE 9-W encompasses the impacted outdoor use areas associated with the Stan Goldman and Hollywood Dog Parks located on the west side of I-95 and between Hollywood Boulevard and Johnson Street Road (see **Figure 3.2, Sheet 7** in **Appendix C**). Stan Goldman Park is a regional park located west of the SFRC / I-95. The southern end of the park includes several trails and the Hollywood Dog Park. The Tri-Rail's Hollywood Station is located between SFRC / I-95 and the southern portion of the park. The northern segments of the park includes tennis courts and a skate park. The Public Storage facility is located between SFRC / I-95 and the northern portion of the park. There are no existing noise barriers along this roadway segment.

The predicted design year (2045) traffic noise levels with the Build Alternative within Stan Goldman and Hollywood Dog Parks ranged from 61.9 to 69.9 dB(A), averaging 0.7 dB(A) lower than existing levels. The lower traffic noise levels are



attributed to the elevated sections of the proposed southbound CD road on a MSE wall that block some of the I-95 mainline traffic noise and to the proposed concrete barrier walls versus guard rail along the southbound off ramp to Hollywood Boulevard. Nine of the receptor sites modeled are predicted to be impacted by design year (2045) noise levels (see **Table 3.3** in **Appendix D**). Therefore, noise barriers were considered as a noise abatement measure at this location.

The results of the noise barrier analysis are summarized in **Table 4.4.1.1**. Four ground mounted conceptual noise barrier designs of varying dimensions were evaluated along the western right-of-way line of I-95 to reduce traffic noise levels at this location. Two of the four conceptual noise barrier designs meet the minimum noise reduction design goal of 7 dB(A) for at least one benefited site. Of the four conceptual barrier designs evaluated, CD 9W-3 is the lowest cost conceptual barrier design that benefits 100 percent of the impacted area. Conceptual barrier design CD 9W-3 represents a 22-foot-tall ground mounted noise barrier that extends approximately 1,600 feet, from Station 345+00 to Station 361+00. This barrier would provide an average reduction of 6.1 dB(A) and a maximum noise reduction of 7.3 dB(A). The estimated construction cost of this conceptual barrier design is \$960,000.

The FDOT's Special Land Use Methodology was used to determine if conceptual noise barrier design CD 9W-3 would meet the reasonable cost criteria. For CD 9W-3 to meet the cost criteria requires a daily usage rate of 1,349 person-hours per day of the areas being benefited by this conceptual noise barrier design (see **Table 4.4.1-2**). It is not reasonable to assume that this area would experience this level of use on a typical day. The impacted areas of these parks represent passive recreation and the use of the trails and dog park would be expected to be intermittent. Based on the analysis performed, noise barriers are not considered reasonable at this location since they do not meet FDOT's required cost criteria. Therefore, noise barriers are not recommended for further consideration at this location during the project's design phase.

4.4.2 COMMON NOISE ENVIRONMENT CNE 10-E (HOLLYWOOD LITTLE RANCHES/NSA 22E)

Common Noise Environment CNE 10-E encompasses the impacted single and multi-family residences within the Hollywood Little Ranches community located on the east side of I-95 and between Hollywood Boulevard and Johnson Street



(see **Figure 3.2, Sheet 7** in **Appendix C**). The residences in these community are currently being benefited by a noise barrier system (FDOT ID Numbers: CD20) that consists of a 22-foot-tall ground mounted noise barrier along the eastern right-of-way line of I-95 and a 14-foot tall shoulder mounted noise barrier along the Hollywood Boulevard northbound on ramp to I-95 (see **Figure 3.1, Sheet 3**). However, the proposed project improvements will physically impact the existing 14-foot tall shoulder mounted noise barriers and it will need to be removed. The existing ground mounted noise barrier segment will not be affected and will remain in place.

With the existing shoulder mounted noise barrier segment removed, the predicted design year (2045) noise levels for the Build Alternative within these residential communities ranged from 55.3 to 75.6 dB(A), approximately 6.7 dB(A) higher than existing levels. Twenty seven residences within these communities are predicted to be impacted by design year (2045) noise levels (see **Table 3.3** in **Appendix D**). Therefore, replacement and supplemental noise barriers were evaluated as a noise abatement measure at this location.

The results of the analysis to determine the replacement noise barrier system for the noise barrier segment physically impacted by the project are summarized in **Table 4.4.2.1**. Four conceptual noise barrier designs were evaluated as a replacement barrier system and to reduce traffic noise levels at the 27 impacted residences. Only replacement and supplemental shoulder mounted barriers were considered. Ground mounted noise barriers would be less effective than a shoulder mounted noise barrier since the travel lanes in some areas are higher than the existing right-of-way line especially in the vicinity of the Johnson Street overpass. All four conceptual noise barrier designs evaluated meet the minimum noise reduction design goal of 7 dB(A) for at least one impacted residence. Since this is a replacement noise barrier, the reasonable cost criteria of equal to or less than \$42,000 per benefited receptor site is not applicable. Of the conceptual noise barrier designs evaluated, CD 10E-4 represents the optimal noise barrier design since it maximizes the amount of noise reduction to the impacted residences.

Conceptual Noise Barrier Design CD 10E-4 represents a continuous 8-foot and 14-foot-tall shoulder mounted noise. The 14-foot shoulder mounted noise barrier extends 1,350 feet from Station 355+20 to Station 368+70 (i.e., to the south bridge approach of the Johnson Street overpass) and would represent an in-kind



replacement of the existing noise barrier. The 8-foot-foot tall shoulder mounted noise barrier would extend an addition 330 feet across the Johnson Street bridge between Stations 368+70 to Station 372+00 and represents a supplemental noise barrier that maximizes the noise reduction to the impacted residences in the vicinity of Johnson Street overpass. The recommended noise barrier would benefit 28 residences, including the 27 impacted residences, and would provide an average noise reduction of 8.6 dB(A) at benefited receptor sites with a maximum reduction of 12.9 dB(A). The estimated construction cost of this conceptual noise barrier design is \$646,200 or \$23,079 per benefited receptor site.

Conceptual Noise Barrier Design CD 10E-4 is recommended for further consideration and public input during the project's design phase as replacement noise barrier system. The final decisions on noise barrier dimensions are made during the project's design phase. During the design phase, an engineering constructability review is conducted to confirm that the noise barrier is feasible and support for noise barriers from the benefited noise sensitive sites is determined. Note that any of the 14-foot tall shoulder mounted noise barriers recommended for construction on a retaining or MSE wall will need approval in writing by the State Structures Design Engineer in accordance with FDOT's noise policy.



5.0 CONCLUSIONS

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), the FDOT's PD&E Manual, Part 2, Chapter 18, *Highway Traffic Noise* (July 1, 2020), and *FDOT's Traffic Noise Modeling and Analysis Practitioners Handbook* (December 31, 2018).

Design year (2045) traffic noise levels for the preferred alternative will approach [i.e., within 1 dB(A)], meet, or exceed the Noise Abatement Criteria (NAC) at 182 residences and seven special land use sites within the project limits within 13 NSAs. In accordance with FHWA and FDOT policies, the feasibility and reasonableness of noise barriers were considered for these impacted noise sensitive sites. The feasibility of noise barriers by NSA is presented in **Table 3.4** at the end of **Section 3.2**.

Noise barriers were not considered a feasible abatement at two of the 13 impacted NSAs (i.e., 12W and 18W) since an effective noise barrier at these locations would block direct access to these noise sensitive areas. NSA 12W represents two impacted residences within Central Golf Section of Hollywood subdivision (i.e., NSA 12W) located west of I-95 and south of Hollywood Boulevard. The southern portion of NSA 18W represents the outdoor use areas associated with Lions Park located west of I-95 and north of Hollywood Boulevard. The locations of this subdivision and park are depicted in **Figure 5.1, Sheet 3** at the end of **Section 5.0**.

Noise barriers were evaluated for 180 of 182 residences and five of the seven special land use sites that approach, meet, or exceed the NAC. Ten separate CNEs were used to assess noise barriers at these locations (i.e., CNE 1-W through CNE 10-E). The results of the noise barrier analysis for each of these CNEs are summarized in **Table 5.1** at the end of **Section 5.0**, as well as in **Sections 4.1.1** through **4.4.2**. Of the 10 CNEs presented in **Table 5.1**, noise barriers are recommended for further consideration during the project's design phase and for public input at four locations (CNEs 2-W, 3-E, 8-E, and 10-E). Noise barriers are not recommended for further consideration at six locations (CNEs 1-W, 4-E, 5-E, 6-W, 7-W, and 9-W). The locations and limits of the noise barriers (both recommended and not recommended) are depicted on **Figure 5.1** and presented in **Table 5.1**.



Noise barriers at one (i.e., CNE 2-W) of the four CNEs where noise barriers have been recommended for further consideration during the project's design phase are not currently considered feasible. The optimal conceptual barrier design at this location meets FDOT's noise barrier cost criteria of equal to or less than \$42,000 per benefited receptor site and FDOT's noise reduction reasonableness criteria of 7 dB(A) at one or more impacted sites. However, there does not appear to be sufficient right-of-way to construct a noise barrier at this location along the southside of Hallandale Beach Boulevard in the vicinity of the Green Acres Villages and Holiday Mobile Estates communities. Although noise barriers are not currently considered feasible, they are recommended for further evaluation at this location during the project's design phase when additional design information including topographical survey would be available to confirm the available right-of-way at this location. The recommended noise barrier system at this location is expected to reduce traffic noise by at least 5 dB(A) at 20 residences including the three impacted residences within these residential communities. The estimated cost of the recommended noise barrier system is \$228,000.

Noise barriers at three of the four CNEs where noise barriers have been recommended for further consideration represent replacement noise barrier systems (i.e., CNEs 3-E, 8-E, and 10-E). At these three locations, the existing noise barriers or segments of the existing noise barriers, would be physically impacted by the proposed improvements and be required to be removed and replaced. The conceptual designs of these replacement noise barriers would be, at a minimum, an in-kind replacement or optimized with supplemental noise barriers to maximize the amount of noise reduction at the impacted noise sensitive receptors. In addition, the recommended conceptual noise barrier designs will meet the minimum noise reduction design goal of 7 dB(A) for at least one impacted residence. Since these are replacement noise barriers, the reasonable cost criteria of equal to or less than \$42,000 per benefited receptor site is not applicable in accordance with FDOT's noise policy. The recommended replacement noise barriers at these three CNEs are expected to reduce traffic noise by at least 5 dB(A) at 163 residences including 146 of the 175 impacted residences within these areas. In addition, the recommended noise barrier system for CNE 8-E would provide incidental benefit to one of the impacted special land uses (i.e., NSA 16E representing a playground associated with St. John's Lutheran Church). The estimated cost of the recommended noise barriers is \$3,112,200.



Additional noise barrier analysis will be performed during the project's design phase when more detailed project design information is available. It is during the project's design phase that final decisions regarding noise barrier length and height are made and an engineering constructability review is conducted to confirm that the noise barrier is feasible and support for noise barriers from the benefited noise sensitive sites is determined. Note that any of the 14-foot tall shoulder mounted noise barriers recommended for construction on a retaining or MSE wall will need approval in writing by the State Structures Design Engineer in accordance with FDOT's noise policy.

Noise barriers were not found to be feasible or cost reasonable at six CNEs. One of the six CNEs represent a residential area (i.e., 4-E). The other five represent non-residential/special land use sites (i.e., CNEs 1-W, 5-E, 6-W, 7-W, and 9-W). The cost of noise barriers at the residential areas would exceed FDOT's reasonable cost criteria of equal to or less than \$42,000 per benefited receptor site and the optimal conceptual noise barrier design did not meet the minimum noise reduction design goal of 7 dB(A) for at least one impacted residence. The usages of the special land use sites were less than required to be cost reasonable.

Based on the noise analysis performed to date, there appears to be no apparent solutions available to mitigate the noise impacts at 33 of the 182 impacted residences or at five special land use sites along the project corridor. Therefore, impacts to these and other noise sensitive sites along the project corridor are an unavoidable consequence of the project.

Statement of Likelihood

FDOT is committed to the construction of feasible noise abatement measures (i.e., recommended noise barriers) at the noise impacted locations identified in **Table 5.1** and **Figure 5.1** upon the following conditions:

- Final recommendations on the construction of abatement measures are determined during the project's design and through the public involvement process;
- Detailed noise analyses during the final design process support the need, feasibility, and reasonableness of providing abatement;
- Cost analysis indicates that the cost of the noise barrier(s) will not exceed the cost reasonable criterion;
- Community input supporting types, heights, and locations of the noise barrier(s) is provided to the District Office; and

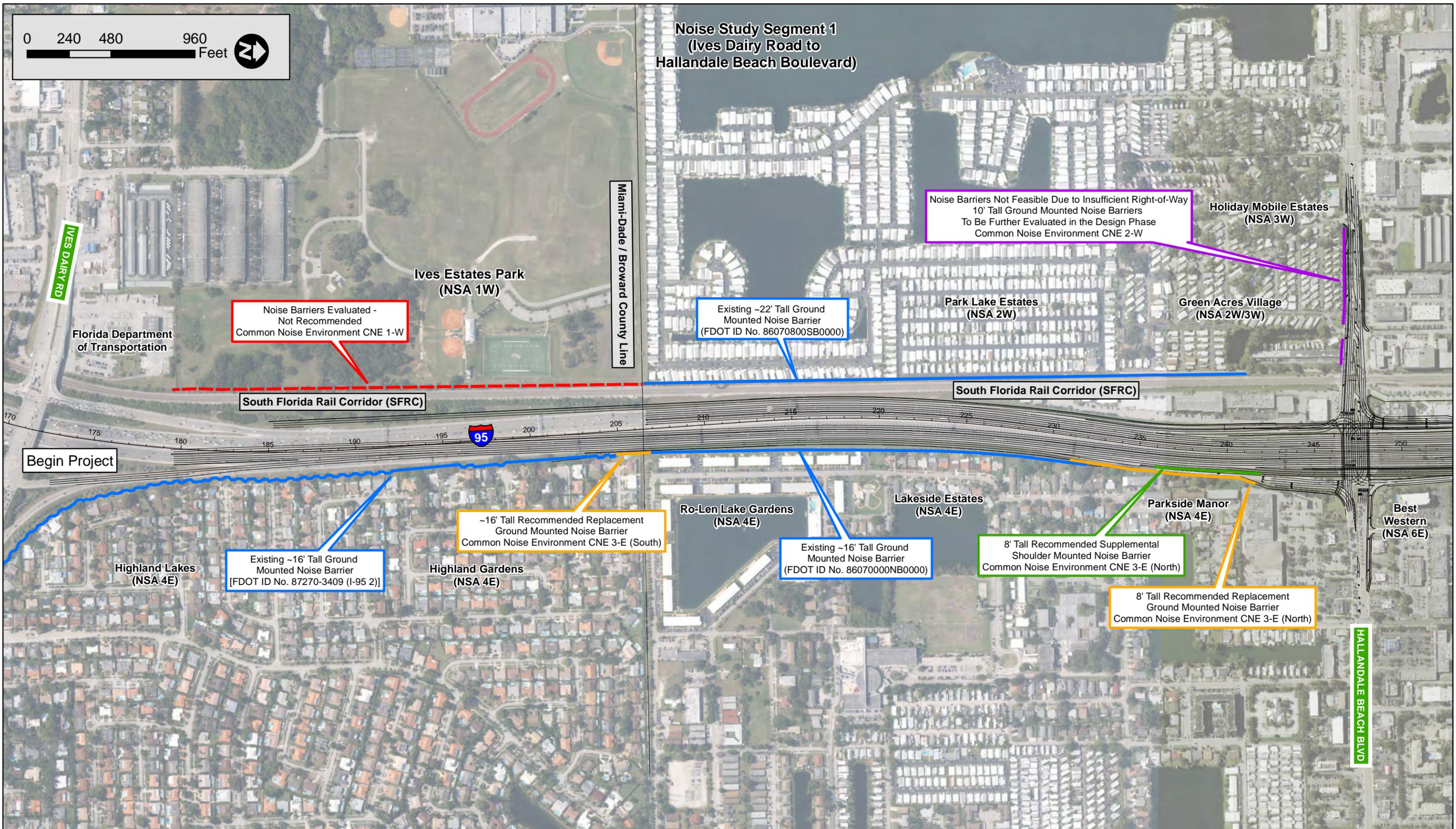


- Safety and engineering aspects as related to the roadway user and the adjacent property owner have been reviewed and any conflicts or issues resolved.

It is likely that the noise abatement measures for the identified locations will be constructed if found feasible based on the contingencies listed above. If, during the project's design phase, any of the contingency conditions listed above cause abatement to no longer be considered reasonable or feasible for a given location(s), such determination(s) will be made prior to requesting approval for construction advertisement. Commitments regarding the exact abatement measure locations, heights, and type (or approved alternatives) will be made during project reevaluation and at a time before the construction advertisement is approved.



**Noise Study Segment 1
(Ives Dairy Road to
Hallandale Beach Boulevard)**



Noise Barriers Evaluated -
Not Recommended
Common Noise Environment CNE 1-W

Existing ~22' Tall Ground
Mounted Noise Barrier
(FDOT ID No. 86070800SB0000)

Noise Barriers Not Feasible Due to Insufficient Right-of-Way
10' Tall Ground Mounted Noise Barriers
To Be Further Evaluated in the Design Phase
Common Noise Environment CNE 2-W

Existing ~16' Tall Ground
Mounted Noise Barrier
(FDOT ID No. 87270-3409 (I-95 2))

~16' Tall Recommended Replacement
Ground Mounted Noise Barrier
Common Noise Environment CNE 3-E (South)

Existing ~16' Tall Ground
Mounted Noise Barrier
(FDOT ID No. 86070000NB0000)

8' Tall Recommended Supplemental
Shoulder Mounted Noise Barrier
Common Noise Environment CNE 3-E (North)

8' Tall Recommended Replacement
Ground Mounted Noise Barrier
Common Noise Environment CNE 3-E (North)

I-95 (SR 9) PD&E Study from
South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, Florida
FPID No. 436903-1-22-02

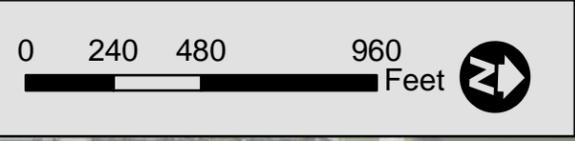


- Noise Barriers**
- Existing Noise Barrier to Remain
 - Replacement of Existing Noise Barrier
 - Supplemental Noise Barrier
 - Noise Barrier Not Feasible
 - Not Recommended Noise Barrier
- Proposed Improvements



**Figure 5.1
Noise Barrier
Recommendation Map
Sheet 1 of 3**

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Noise Study Segment 2
(Hallandale Beach Boulevard to
Pembroke Road)

Noise Study Segment 3
(Pembroke Road to
Hollywood Boulevard)



I-95 (SR 9) PD&E Study from
South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, Florida
FPID No. 436903-1-22-02



- Noise Barriers**
- Existing Noise Barrier to Remain
 - Replacement of Existing Noise Barrier
 - Supplemental Noise Barrier
 - Noise Barrier Not Feasible
 - Not Recommended Noise Barrier
- Proposed Improvements



Figure 5.1
Noise Barrier
Recommendation Map
Sheet 2 of 3 5-6

July 2021

Table 5.1 - Noise Barrier Evaluation Summary and Recommendations

Noise Sensitive Area Name / Number	Common Noise Environment (CNE) Identification Number/ (Conceptual Noise Barrier Design Number)	Optimized Conceptual Noise Barrier Design					Number of Impacted Receptor Sites	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)	Maximum Noise Reduction for all Benefited Receptor Sites dB(A)	Cost (\$30 per square foot)	Average Cost/Site Benefited	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 and Feasible?	Noise Barrier Recommended for Further Consideration and Public Input?	Comments
		Noise Barrier Type (Segment)	Height (feet)	Length (feet)	Begin Station Number	End Station Number											
Ives Estates Park - West of I-95 between Ives Dairy Road and Miami-Dade / Broward County Line / NSA 1 W	CNE 1-W (CD 1W-4)	Ground Mounted	22	2,740	179+20	206+60	Special Land Use	--	--	--	7.8	10.3	\$1,808,400	--	NO (Usage of Park Recreational Facilities Less Than Required to be Cost Reasonable)	NO	Represents the optimal conceptual noise barrier design; Does not meet the Reasonableness Cost Criteria for special land uses; Noise barriers are not recommended for further consideration or public input during the project's design phase at this location.
Green Acres Village and Holiday Mobile Estates - South of Hallandale Beach Boulevard and West of I-95 / NSA 3W	CNE 2-W (CD 2W-2)	Ground Mounted (Segment 1 of 2)	10	590	132+00	137+90	3	3	17	20	6.8	8.8	\$228,000	\$11,400	NO (Not Feasible - Insufficient Right-of-way to Constructed Noise Barrier)	Yes (See Comments)	Not considered a feasible abatement measure due to insufficient existing right-of-way to accommodate a noise barrier at this location; Noise barriers are recommended to be further evaluated at this location during the project's design phase when additional design information including topographical survey would be available.
		Ground Mounted (Segment 2 of 2)	10	170	138+30	140+00											
Highland Gardens and Parkside Manor Communities - East of I-95 and between Ives Dairy Road and Hallandale Beach Boulevard / NSA 4E	CNE 3-E (CD 3E-1S and CD 3E-4N)	South Segment - Replacement Ground Mounted Noise Barrier	16	200	204+80	206+80	11	2	0	2	9.6	12.3	\$96,000	\$48,000	NO (Not Required - In-Kind Replacement Noise Barrier)	Yes (Replacement Noise Barriers)	Two segments of the existing ground mounted noise barrier are physically impacted by the widening of I-95 and require replacement; Represents the optimal conceptual replacement noise barrier system design and is recommended for further consideration and public input in the project's design phase.
		North Segment - Replacement Shoulder Mounted Noise Barriers	14	1,080	231+00	241+80	47	43	11	54	8.1	12.1	\$597,600	\$11,067	YES (Not Required - Replacement Noise Barrier System)		
		North Segment - Supplemental Shoulder Mounted Noise Barrier	8	600	236+00	242+00											
Meekins Addition No.1 Subdivision - East of I-95 and South of Pembroke Road / NSA 8E	CNE 4-E (CD 4E-5)	Shoulder Mounted (Off Ramp)	8	700	274+00	281+00	2	2	0	2	5.2	6.2	\$786,600	\$393,300	NO	NO	Represents the optimal conceptual noise barrier design; Does not meet the Cost Reasonable Criteria and the minimum noise reduction design goal of 7 dB(A); Noise barriers are not recommended for further consideration or public input during the project's design phase at this location.
		Ground Mounted Noise Barrier (I-95 Eastern Right-of-Way Line)	22	610	281+00	287+00											
		Shoulder Mounted (CD Road)	8	900	278+00	287+00											
Choices Children's Academy - East of I-95 and South of Pembroke Road / NSA 9E	CNE 5-E (CD 5E-4)	Ground Mounted (I-95 Eastern Right-of-Way Line)	22	560	283+00	287+60	Special Land Use	---	---	---	6.7	8.2	\$933,600	---	NO (Usage of Park Recreational Facilities Less Than Required to be Cost Reasonable)	NO	Represents the optimal conceptual noise barrier design; Does not meet the Reasonableness Cost Criteria for special land uses; Noise barrier are not recommended for further consideration or public input during the project's design phase at this location.
		Shoulder Mounted (Off Ramp)	8	600	275+00	281+00											
		Shoulder Mounted (Off Ramp)	14	600	281+00	287+00											
		Shoulder Mounted (I-95 Northbound)	8	700	280+00	287+00											
Orangebrook Golf & Country Club - West of I-95 between Pembroke Road and Hollywood Boulevard / NSA 10W	CNE 6-W (CD 6W-4S and CD 6W-1N)	Ground Mounted Noise Barrier (South Segment)	22	260	289+40	292+00	Special Land Use	--	--	--	6.2	7.1	\$171,600	--	NO (Usage of Golf Course Less Than Required to be Cost Reasonable)	NO	Represents the optimal conceptual noise barrier design; Does not meet the Reasonableness Cost Criteria for special land uses; Noise barrier are not recommended for further consideration or public input during the project's design phase at this location.
		Ground Mounted Noise Barrier (North Segment)	16	460	334+00	338+60											
Hollywood Jaycee Hall - West of I-95 and South of Hollywood Boulevard / NSA 11W	CNE 7-W (CD 7W-2)	Ground Mounted Noise Barrier	22	280	337+80	340+60	Special Land Use	---	---	---	7.2	7.2	\$184,800	---	NO (Usage of Parks and Recreational Facilities Less Than Required to be Cost Reasonable)	NO	Represents the optimal conceptual noise barrier design; Does not meet the Reasonableness Cost Criteria for special land uses; Noise barrier are not recommended for further consideration or public input during the project's design phase at this location.
South Hollywood, Bermack Heights, The Town Colony Condominiums, Jaxon Heights, and Hollywood Little Ranches Communities - East of I-95 between Pembroke Road and Hollywood Boulevard / NSA 14E and St. John's Lutheran Church / NSA 16E	CNE 8-E (CD 8E-3)	Segment 1 of 4 - Replacement Shoulder Mounted Noise Barrier	14	2,900	298+30	327+30	90	74	5	79	7.9	11.1	\$1,772,400	\$22,435	YES (Not Required - Replacement Noise Barrier System)	Yes (Replacement Noise Barriers)	Segments of the existing noise barrier are physically impacted by the widening of I-95 and require replacement; Represents the optimal conceptual replacement noise barrier system design and is recommended for further consideration and public input in the project's design phase; St. John's Lutheran Church playground would receive incidental benefit from this conceptual noise barrier design.
		Segment 2 of 4 - Replacement Shoulder Mounted Noise Barrier	14	570	327+30	333+00											
		Segment 3 of 4 - Replacement Shoulder Mounted Noise Barrier	14	440	333+00	337+40											
		Segment 4 of 4 - Supplemental Shoulder Mounted Noise Barrier	14	310	337+40	340+50											
Stan Goldman Park and Hollywood Dog Park - West of I-95 and North of Hollywood Boulevard / NSA 18W	CNE 9-W (CD 9W-3)	Ground Mounted Noise Barrier (I-95 Western Right-of-Way Line)	20	1,600	345+00	361+00	Special Land Use	---	---	---	6.1	7.3	\$960,000	---	NO (Usage of Parks and Recreational Facilities Less Than Required to be Cost Reasonable)	NO	Represents the lowest cost conceptual noise barrier design; The conceptual design meets FDOT's 7.0 dB(A) Noise Reduction Design Goal, but does not meet the Reasonableness Cost Criteria; A noise barrier is not recommended for further consideration or public input during the project's design phase at this location.
Hollywood Little Ranches - East of I-95 and North of Hollywood Boulevard / NSA 22E	CNE 10-E (CD 10E-4)	Segment 1 of 2 - Replacement Shoulder Mounted Noise Barrier	14	1,350	355+20	368+70	27	27	1	28	8.6	12.9	\$646,200	\$23,079	YES (Not Required - Replacement Noise Barrier System)	Yes (Replacement Noise Barriers)	Represents the optimal conceptual replacement noise barrier system design and is recommended for further consideration and public input in the project's design phase; Segments of the existing noise barrier are physically impacted by the widening of I-95 and require replacement; 14-foot tall shoulder mounted noise barrier will require a design variation since it will be on an MSE wall.
		Segment 2 of 2 - Supplemental Shoulder Mounted Noise Barrier	8	330	368+70	372+00											



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. Construction related 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. A reassessment of the project corridor for additional sites particularly sensitive to construction noise and/or vibration will be performed during the final design phase to ensure that impacts to such sites are minimized.



7.0 COMMUNITY COORDINATION

Coordination with local agencies and officials has been accomplished during the development of this project. In addition, local and community officials have had the opportunity to comment on the proposed project at the public meetings

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 Broward County, Miami-Dade County, City of Hollywood, City of Hallandale Beach, and the Town of Pembroke Park . In addition, generalized future noise impact contours for the properties in the immediate vicinity of the project have been developed for Noise Abatement Activity Categories B/C and E (i.e., residential and 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 I-95 to the limits of the area predicted to approach [i.e., within 1 dB(A)] the NAC in the design year (2045). The contours do not consider any shielding of noise provided by structures between the receptor and the proposed travel lanes. Within the project corridor, the distance between the proposed edge of the outside travel lane and the contour at various locations are presented in **Table 7.1**. To minimize the potential for incompatible land use, noise sensitive land uses should be located beyond this distance.



Table 7.1 – Design Year (2045) Noise Impact Contour Distances

I-95 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
Ives Dairy Road to Pembroke Road	West of I-95	470	285
	East of I-95	345	200
Pembroke Road to North of Johnson Street	West of I-95	420	245
	East of I-95	235	91



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", December 2011; 75 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.

Florida Department of Transportation. "Highway Traffic Noise", Part 2, Chapter 18. Project Development and Environment Manual, Florida Department of Transportation, Tallahassee, July 1, 2020.

Florida Department of Transportation. "Design Manual", Topic No. 625-000-002, Part 2, Section 264, Noise Walls and Perimeter Walls, 2020.

Florida Department of Transportation "Standard Specifications for Road and Bridge Construction", July 2021.

Florida Department of Transportation "Traffic Noise Modeling and Analysis Practitioners Handbook", December 31, 2018.

University of Central Florida "A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations", Roger L. Wayson and John M. MacDonald, Updated July 22, 2009; 64 pp.



APPENDIX A
Traffic Data for Noise Modeling

TRAFFIC ANALYSIS TECHNICAL MEMORANDUM

Interstate 95 (I-95) / State Road 9 (SR 9) Project Development and Environment Study

Project Study Limits:

From South of Hallandale Beach Boulevard (SR 858) to
North of Hollywood Boulevard (SR 820), Broward County
Mileposts 0.0 – 3.1
ETDM Number 14254

Broward County
FPID Number 436903-1-22-02

Prepared for:

Florida Department of Transportation – District Four
2300 West Commercial Boulevard
Fort Lauderdale, FL 33309



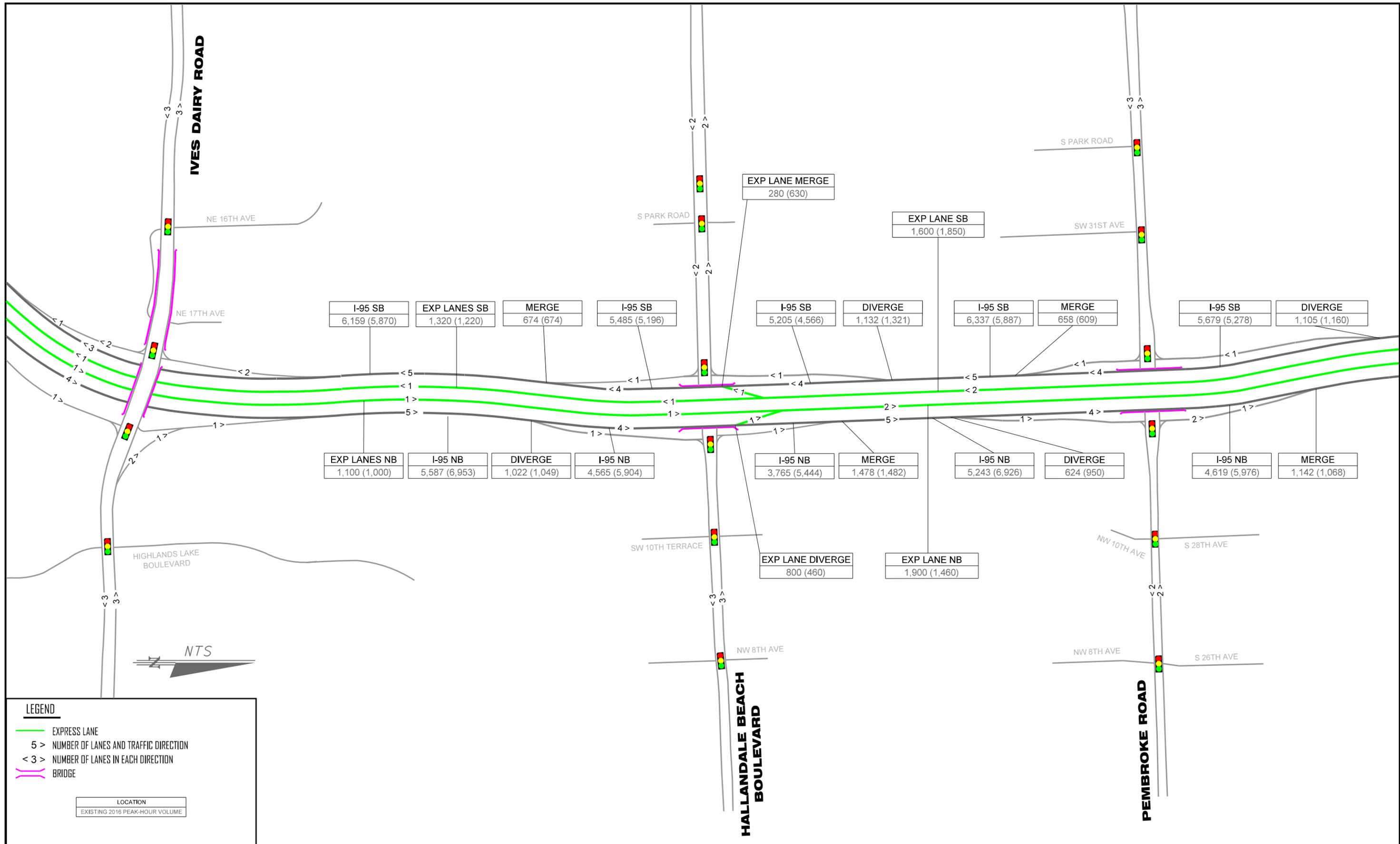
Prepared By:

*The Corradino Group
5200 NW 33rd Avenue, Suite 203
Fort Lauderdale, FL 33309*

In Coordination With:

*HDR
3250 West Commercial Boulevard,
Fort Lauderdale, FL 33309*

NOVEMBER 2018



LEGEND

- EXPRESS LANE
- 5 > NUMBER OF LANES AND TRAFFIC DIRECTION
- < 3 > NUMBER OF LANES IN EACH DIRECTION
- BRIDGE

LOCATION	EXISTING 2016 PEAK-HOUR VOLUME



FLORIDA DEPARTMENT OF TRANSPORTATION
 DISTRICT FOUR
 3400 WEST COMMERCIAL BOULEVARD
 FORT LAUDERDALE, FL 33309

FEBRUARY 2018

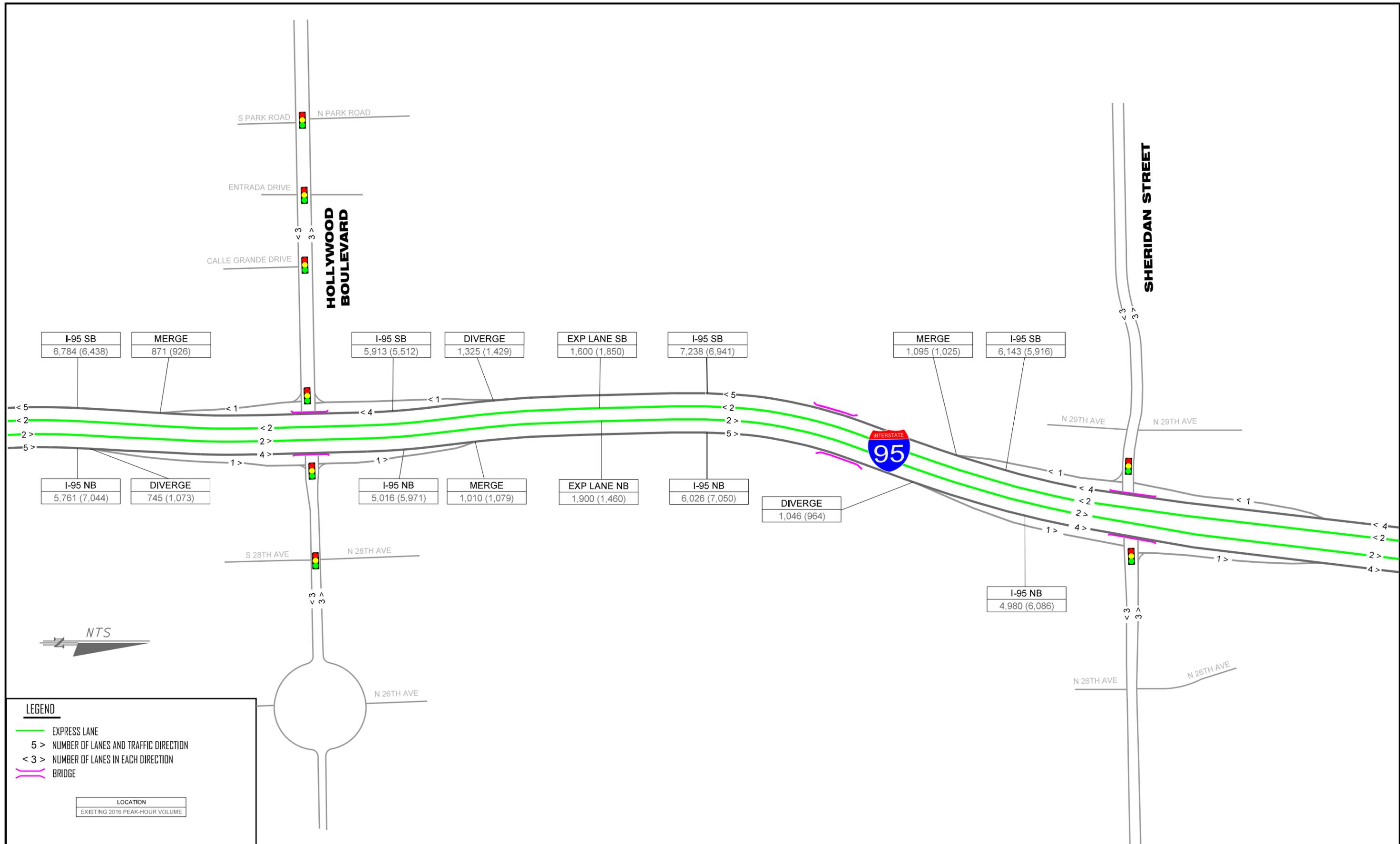


I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY
 from South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
 FPID No.: 438903-1-22-02
 ETDM No.: 14254

2016 I-95 PEAK-HOUR VOLUMES

FIGURE 6.2

21



FLORIDA DEPARTMENT OF TRANSPORTATION
 DISTRICT FOUR
 3400 WEST COMMERCIAL BOULEVARD
 FORT LAUDERDALE, FL 33309

FEBRUARY 2018

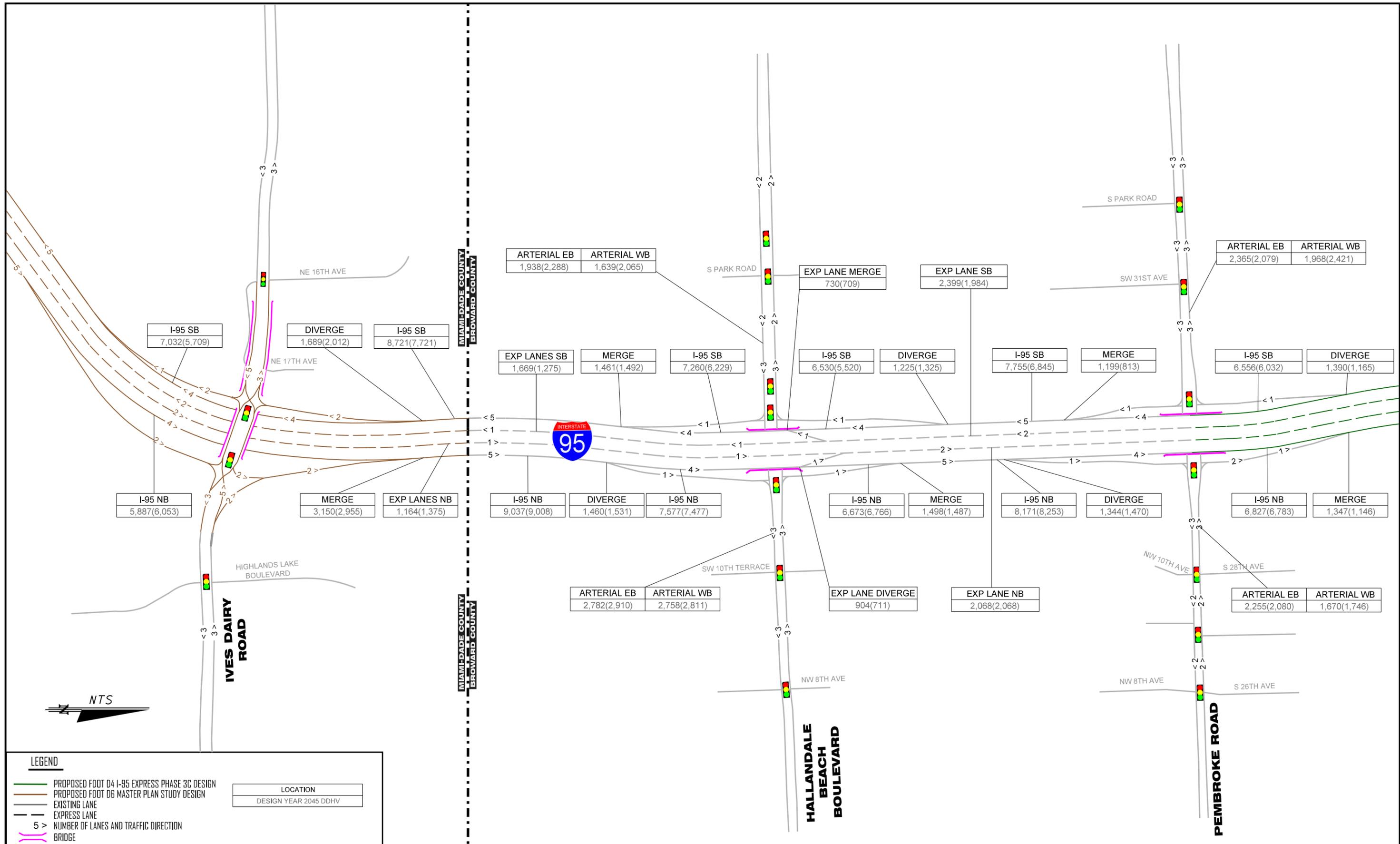


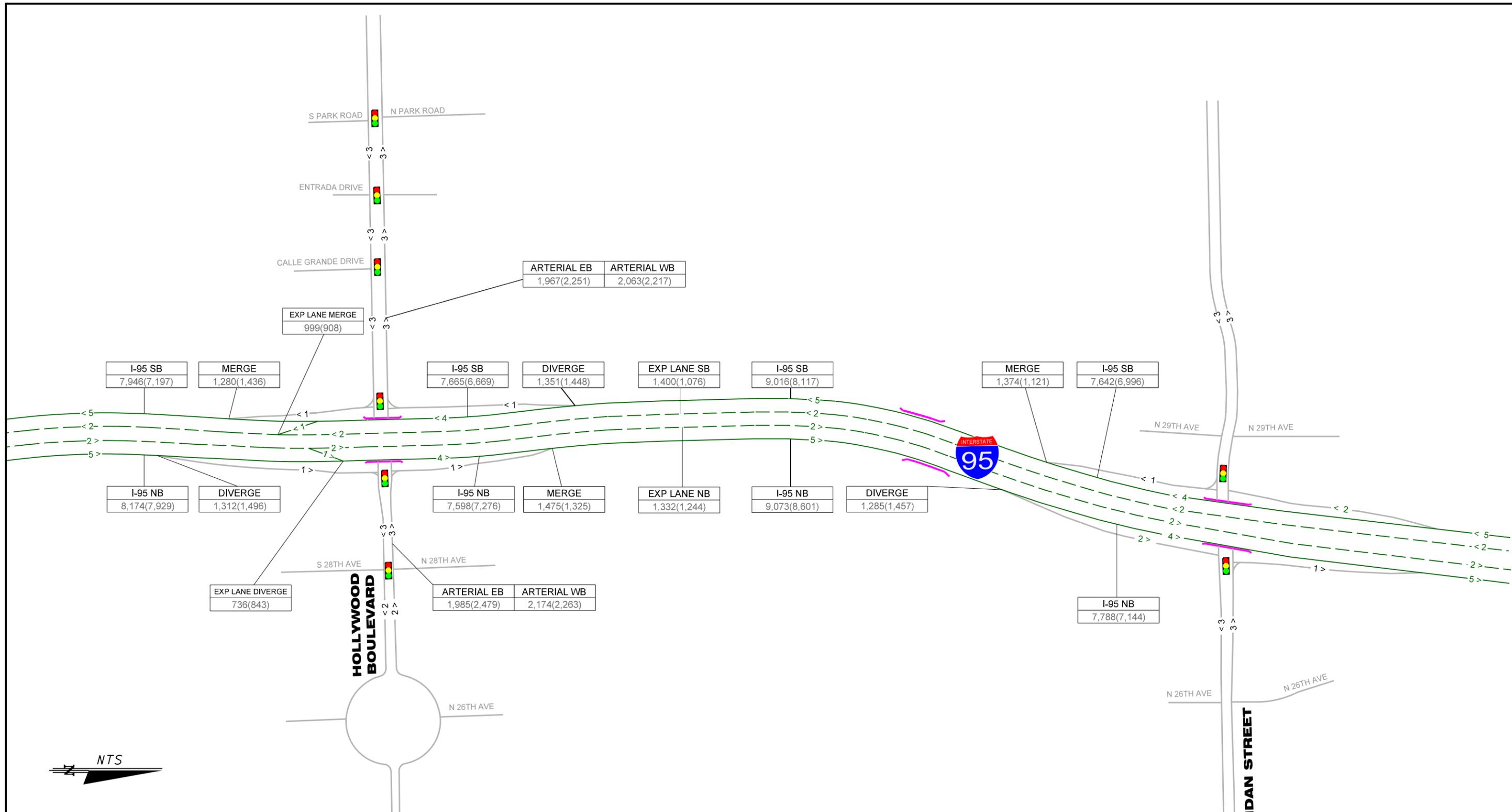
I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY
 from South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
 FPID No.: 436903-1-22-02
 ETDM No.: 14254

2016 I-95 PEAK-HOUR VOLUMES

FIGURE 6.2

22





LEGEND

- PROPOSED FOOT D4 I-95 EXPRESS PHASE 3C DESIGN
- PROPOSED FOOT D6 MASTER PLAN STUDY DESIGN
- EXISTING LANE
- EXPRESS LANE
- 5 > NUMBER OF LANES AND TRAFFIC DIRECTION
- BRIDGE

LOCATION
DESIGN YEAR 2045 DDHV



FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT FOUR
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309

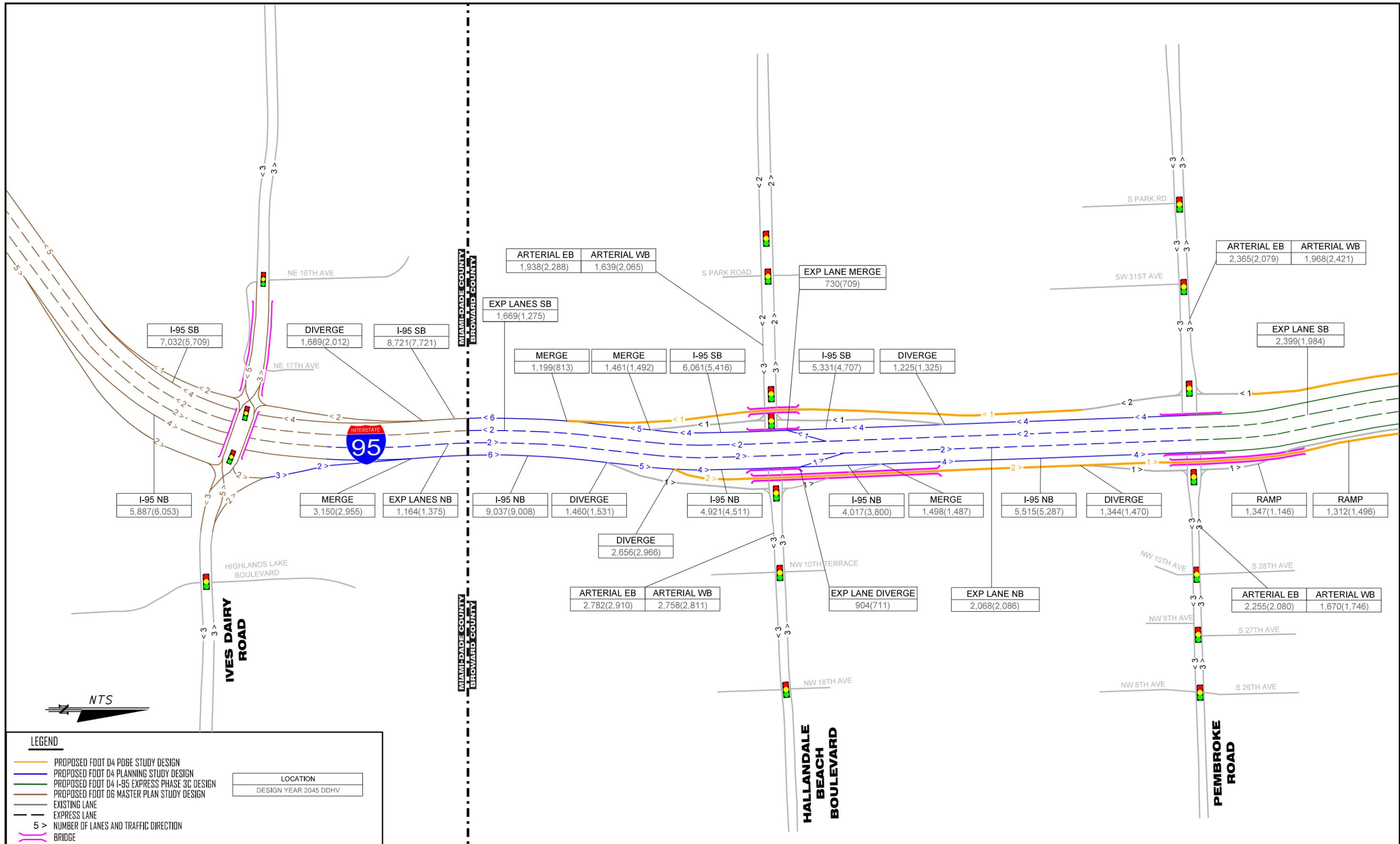
SEPTEMBER 2020



I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY
from South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
FPID No.: 436903-1-22-02
ETDM No.: 14254

DIRECTIONAL DESIGN HOURLY VOLUMES (DDHV)
2045 DESIGN YEAR NO-BUILD ALTERNATIVE

FIGURE
10.5
57



FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT FOUR
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309

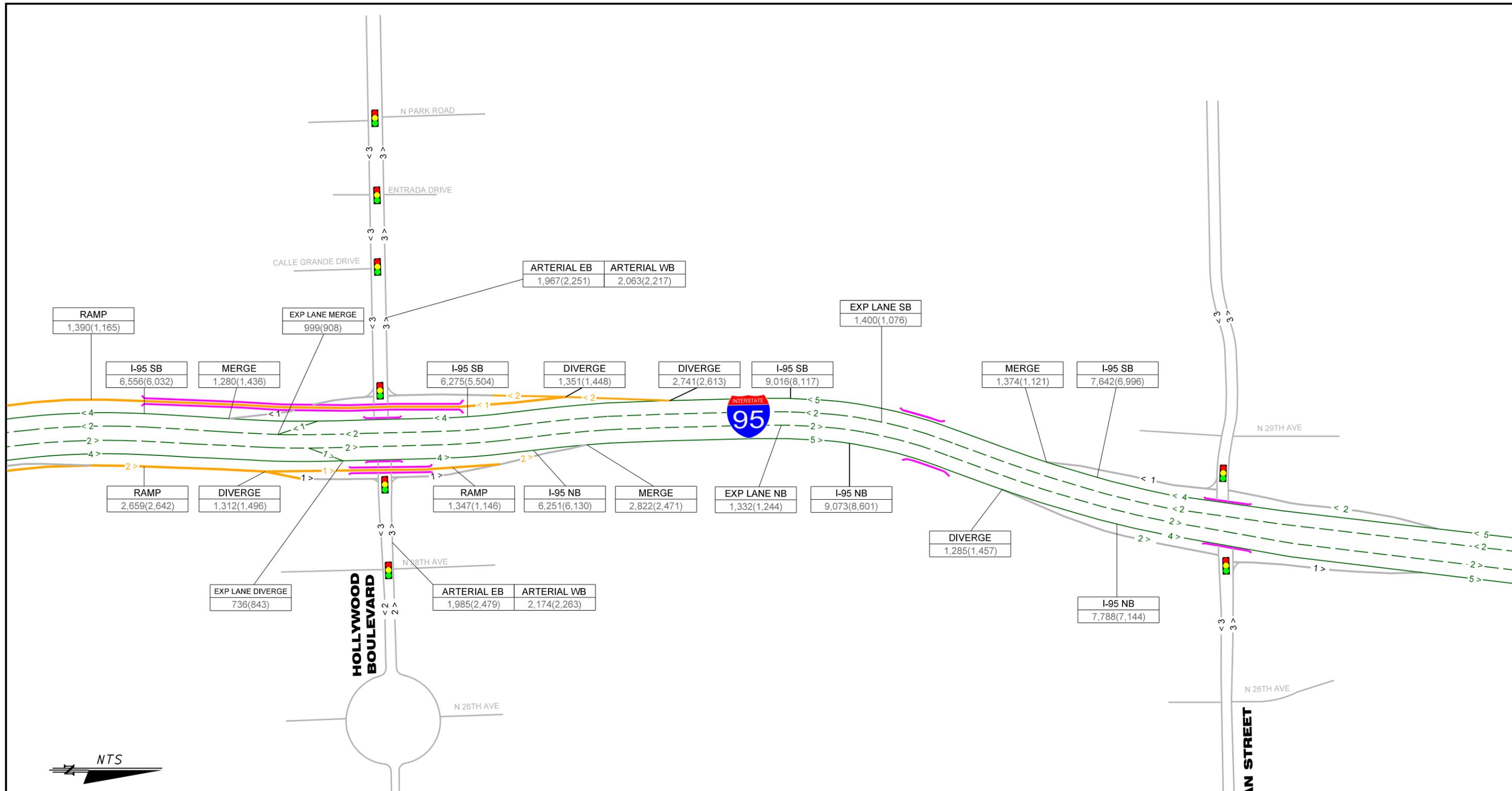
SEPTEMBER 2020



I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY
from South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
FPID No.: 438903-1-22-02
ETDM No.: 14254

DIRECTIONAL DESIGN HOURLY VOLUMES (DDHV)
2045 DESIGN YEAR BUILD ALTERNATIVE

FIGURE
10.11
68



LEGEND

- PROPOSED FDOT D4 PD&E STUDY DESIGN
- PROPOSED FDOT D4 PLANNING STUDY DESIGN
- PROPOSED FDOT D4 I-95 EXPRESS PHASE 3C DESIGN
- PROPOSED FDOT D6 MASTER PLAN STUDY DESIGN
- EXISTING LANE
- EXPRESS LANE
- 5 > NUMBER OF LANES AND TRAFFIC DIRECTION
- BRIDGE

LOCATION
DESIGN YEAR 2045 DDHV

Traffic Data for Noise Studies

Federal Aid Number(s):	
FPID Number(s):	436903-1-22-02
State/Federal Route No.:	State Road 9 (SR 9)
Road Name:	Interstate 95 (I-95)
Project Description:	PD&E Study
Segment Description:	South of Hallandale Beach Blvd (SR 858) to North of Hollywood Blvd (SR 820)
Section Number:	
Mile Post To/From:	0.0 – 3.1

Facility: I-95 general purpose lanes, north of Hollywood Blvd			
Scenario: Existing			
		D =	51.5 %
		T24=	4.57 % of 24 Hour Volume
Year:	2016	Tpeak =	2.29 % of Design Hour Volume
		MT =	1.95 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	7430	HT =	2.39 % of Design Hour Volume
Demand Peak Hour Volume:	7238	B =	0.23 % of Design Hour Volume
Posted Speed:	65	MC =	0.18 % of Design Hour Volume

Facility: I-95 general purpose lanes, Hollywood Blvd to Pembroke Rd			
Scenario: Existing			
		D =	50.1 %
		T24=	4.57 % of 24 Hour Volume
Year:	2016	Tpeak =	2.29 % of Design Hour Volume
		MT =	1.95 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	7430	HT =	2.39 % of Design Hour Volume
Demand Peak Hour Volume:	7044	B =	0.23 % of Design Hour Volume
Posted Speed:	65	MC =	0.18 % of Design Hour Volume

Facility: I-95 general purpose lanes, Pembroke Rd to Hallandale Beach Blvd			
Scenario: Existing			
		D =	50.6 %
		T24=	4.57 % of 24 Hour Volume
Year:	2016	Tpeak =	2.29 % of Design Hour Volume
		MT =	1.95 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	7430	HT =	2.39 % of Design Hour Volume
Demand Peak Hour Volume:	6926	B =	0.23 % of Design Hour Volume
Posted Speed:	65	MC =	0.18 % of Design Hour Volume

Facility: I-95 general purpose lanes, south of Hallandale Beach Blvd			
Scenario: Existing			
		D =	50.6 %
		T24=	4.57 % of 24 Hour Volume
Year:	2016	Tpeak =	2.29 % of Design Hour Volume
		MT =	1.95 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	7430	HT =	2.39 % of Design Hour Volume
Demand Peak Hour Volume:	6953	B =	0.23 % of Design Hour Volume
Posted Speed:	65	MC =	0.18 % of Design Hour Volume

Traffic Data for Noise Studies

Federal Aid Number(s):	
FPID Number(s):	436903-1-22-02
State/Federal Route No.:	State Road 9 (SR 9)
Road Name:	Interstate 95 (I-95)
Project Description:	PD&E Study
Segment Description:	South of Hallandale Beach Blvd (SR 858) to North of Hollywood Blvd (SR 820)
Section Number:	
Mile Post To/From:	0.0 – 3.1

Facility: I-95 general purpose lanes, north of Hollywood Blvd			
Scenario: 2045 No Build			
		D =	51.5 %
		T24=	4.57 % of 24 Hour Volume
Year:	2045	Tpeak =	2.29 % of Design Hour Volume
		MT =	1.95 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	7430	HT =	2.39 % of Design Hour Volume
Demand Peak Hour Volume:	9073	B =	0.23 % of Design Hour Volume
Posted Speed:	65	MC =	0.18 % of Design Hour Volume

Facility: I-95 general purpose lanes, Hollywood Blvd to Pembroke Rd			
Scenario: 2045 No Build			
		D =	51.2 %
		T24=	4.57 % of 24 Hour Volume
Year:	2045	Tpeak =	2.29 % of Design Hour Volume
		MT =	1.95 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	7430	HT =	2.39 % of Design Hour Volume
Demand Peak Hour Volume:	8174	B =	0.23 % of Design Hour Volume
Posted Speed:	65	MC =	0.18 % of Design Hour Volume

Facility: I-95 general purpose lanes, Pembroke Rd to Hallandale Beach Blvd			
Scenario: 2045 No Build			
		D =	51.3 %
		T24=	4.57 % of 24 Hour Volume
Year:	2045	Tpeak =	2.29 % of Design Hour Volume
		MT =	1.95 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	7430	HT =	2.39 % of Design Hour Volume
Demand Peak Hour Volume:	8253	B =	0.23 % of Design Hour Volume
Posted Speed:	65	MC =	0.18 % of Design Hour Volume

Facility: I-95 general purpose lanes, south of Hallandale Beach Blvd			
Scenario: 2045 No Build			
		D =	50.6 %
		T24=	4.57 % of 24 Hour Volume
Year:	2045	Tpeak =	2.29 % of Design Hour Volume
		MT =	1.95 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	7430	HT =	2.39 % of Design Hour Volume
Demand Peak Hour Volume:	9037	B =	0.23 % of Design Hour Volume
Posted Speed:	65	MC =	0.18 % of Design Hour Volume

Traffic Data for Noise Studies

Federal Aid Number(s):	
FPID Number(s):	436903-1-22-02
State/Federal Route No.:	State Road 9 (SR 9)
Road Name:	Interstate 95 (I-95)
Project Description:	PD&E Study
Segment Description:	South of Hallandale Beach Blvd (SR 858) to North of Hollywood Blvd (SR 820)
Section Number:	
Mile Post To/From:	0.0 – 3.1

Facility: I-95 express lanes, north of Hollywood Blvd			
Scenario: Existing		D =	51.5 %
		T24=	4.57 % of 24 Hour Volume
Year:	2016	Tpeak =	2.29 % of Design Hour Volume
		MT =	1.95 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	3100	HT =	2.39 % of Design Hour Volume
Demand Peak Hour Volume:	1900	B =	0.23 % of Design Hour Volume
Posted Speed:	65	MC =	0.18 % of Design Hour Volume

Facility: I-95 express lanes, Hollywood Blvd to Pembroke Rd			
Scenario: Existing		D =	51.2 %
		T24=	4.57 % of 24 Hour Volume
Year:	2016	Tpeak =	2.29 % of Design Hour Volume
		MT =	1.95 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	3100	HT =	2.39 % of Design Hour Volume
Demand Peak Hour Volume:	1900	B =	0.23 % of Design Hour Volume
Posted Speed:	65	MC =	0.18 % of Design Hour Volume

Facility: I-95 express lanes, Pembroke Rd to Hallandale Beach Blvd			
Scenario: Existing		D =	51.3 %
		T24=	4.57 % of 24 Hour Volume
Year:	2016	Tpeak =	2.29 % of Design Hour Volume
		MT =	1.95 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	3100	HT =	2.39 % of Design Hour Volume
Demand Peak Hour Volume:	1900	B =	0.23 % of Design Hour Volume
Posted Speed:	65	MC =	0.18 % of Design Hour Volume

Facility: I-95 express lanes, south of Hallandale Beach Blvd			
Scenario: Existing		D =	51.0 %
		T24=	4.57 % of 24 Hour Volume
Year:	2016	Tpeak =	2.29 % of Design Hour Volume
		MT =	1.95 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	~1550	HT =	2.39 % of Design Hour Volume
Demand Peak Hour Volume:	1320	B =	0.23 % of Design Hour Volume
Posted Speed:	65	MC =	0.18 % of Design Hour Volume

Traffic Data for Noise Studies

Federal Aid Number(s):	
FPID Number(s):	436903-1-22-02
State/Federal Route No.:	State Road 9 (SR 9)
Road Name:	Interstate 95 (I-95)
Project Description:	PD&E Study
Segment Description:	South of Hallandale Beach Blvd (SR 858) to North of Hollywood Blvd (SR 820)
Section Number:	
Mile Post To/From:	0.0 – 3.1

Facility: I-95 express lanes, north of Hollywood Blvd			
Scenario: 2045 No Build			
Year:	2045	D =	51.5
		T24=	4.57
		Tpeak =	2.29
		MT =	1.95
LOS C Peak Hour Directional Volume:	3100	HT =	2.39
Demand Peak Hour Volume:	1400	B =	0.23
Posted Speed:	65	MC =	0.18

Facility: I-95 express lanes, Hollywood Blvd to Pembroke Rd			
Scenario: 2045 No Build			
Year:	2045	D =	51.2
		T24=	4.57
		Tpeak =	2.29
		MT =	1.95
LOS C Peak Hour Directional Volume:	3100	HT =	2.39
Demand Peak Hour Volume:	2399	B =	0.23
Posted Speed:	65	MC =	0.18

Facility: I-95 express lanes, Pembroke Rd to Hallandale Beach Blvd			
Scenario: 2045 No Build			
Year:	2045	D =	51.3
		T24=	4.57
		Tpeak =	2.29
		MT =	1.95
LOS C Peak Hour Directional Volume:	3100	HT =	2.39
Demand Peak Hour Volume:	2399	B =	0.23
Posted Speed:	65	MC =	0.18

Facility: I-95 express lanes, south of Hallandale Beach Blvd			
Scenario: 2045 No Build			
Year:	2045	D =	50.6
		T24=	4.57
		Tpeak =	2.29
		MT =	1.95
LOS C Peak Hour Directional Volume:	~1550	HT =	2.39
Demand Peak Hour Volume:	1669	B =	0.23
Posted Speed:	65	MC =	0.18

Traffic Data for Noise Studies

Federal Aid Number(s):	
FPID Number(s):	436903-1-22-02
State/Federal Route No.:	State Road 9 (SR 9)
Road Name:	Interstate 95 (I-95)
Project Description:	PD&E Study
Segment Description:	South of Hallandale Beach Blvd (SR 858) to North of Hollywood Blvd (SR 820)
Section Number:	
Mile Post To/From:	0.0 – 3.1

Facility: Hollywood Blvd, west of I-95				
Scenario: Existing		D =	50.8	%
		T24=	2.4	% of 24 Hour Volume
Year:	2016	Tpeak =	1.2	% of Design Hour Volume
		MT =	1.1	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	1170	HT =	1.1	% of Design Hour Volume
Demand Peak Hour Volume:	1913	B =	0.2	% of Design Hour Volume
Posted Speed:	35	MC =	0.1	% of Design Hour Volume

Facility: Hollywood Blvd, east of I-95				
Scenario: Existing		D =	50.8	%
		T24=	7.8	% of 24 Hour Volume
Year:	2016	Tpeak =	3.90	% of Design Hour Volume
		MT =	3.43	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	1170	HT =	3.69	% of Design Hour Volume
Demand Peak Hour Volume:	1592	B =	0.69	% of Design Hour Volume
Posted Speed:	35	MC =	0.44	% of Design Hour Volume

Facility: Pembroke Rd, west of I-95				
Scenario: Existing		D =	50.8	%
		T24=	3.11	% of 24 Hour Volume
Year:	2016	Tpeak =	1.55	% of Design Hour Volume
		MT =	1.07	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	1170	HT =	1.56	% of Design Hour Volume
Demand Peak Hour Volume:	2186	B =	0.47	% of Design Hour Volume
Posted Speed:	35	MC =	0.36	% of Design Hour Volume

Facility: Pembroke Rd, east of I-95				
Scenario: Existing		D =	55.9	%
		T24=	3.9	% of 24 Hour Volume
Year:	2016	Tpeak =	1.9	% of Design Hour Volume
		MT =	1.3	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	1910	HT =	2.0	% of Design Hour Volume
Demand Peak Hour Volume:	1819	B =	0.6	% of Design Hour Volume
Posted Speed:	40	MC =	0.4	% of Design Hour Volume

Traffic Data for Noise Studies

Federal Aid Number(s):	
FPID Number(s):	436903-1-22-02
State/Federal Route No.:	State Road 9 (SR 9)
Road Name:	Interstate 95 (I-95)
Project Description:	PD&E Study
Segment Description:	South of Hallandale Beach Blvd (SR 858) to North of Hollywood Blvd (SR 820)
Section Number:	
Mile Post To/From:	0.0 – 3.1

Facility: Hallandale Beach Blvd, west of I-95			
Scenario: Existing		D =	56.3 %
		T24=	5.2 % of 24 Hour Volume
Year:	2016	Tpeak =	2.6 % of Design Hour Volume
		MT =	3.3 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	730	HT =	1.7 % of Design Hour Volume
Demand Peak Hour Volume:	1800	B =	0.3 % of Design Hour Volume
Posted Speed:	35	MC =	0.4 % of Design Hour Volume

Facility: Hallandale Beach Blvd, east of I-95			
Scenario: Existing		D =	56.3 %
		T24=	2.67 % of 24 Hour Volume
Year:	2016	Tpeak =	1.33 % of Design Hour Volume
		MT =	1.68 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	2940	HT =	0.85 % of Design Hour Volume
Demand Peak Hour Volume:	2589	B =	0.13 % of Design Hour Volume
Posted Speed:	40	MC =	0.21 % of Design Hour Volume

Traffic Data for Noise Studies

Federal Aid Number(s):	
FPID Number(s):	436903-1-22-02
State/Federal Route No.:	State Road 9 (SR 9)
Road Name:	Interstate 95 (I-95)
Project Description:	PD&E Study
Segment Description:	South of Hallandale Beach Blvd (SR 858) to North of Hollywood Blvd (SR 820)
Section Number:	
Mile Post To/From:	0.0 – 3.1

Facility: Hollywood Blvd, west of I-95				
Scenario: 2045 No Build				
Year:	2045	D =	50.8	%
		T24=	2.4	% of 24 Hour Volume
		Tpeak =	1.2	% of Design Hour Volume
		MT =	1.1	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	1170	HT =	1.1	% of Design Hour Volume
Demand Peak Hour Volume:	2251	B =	0.2	% of Design Hour Volume
Posted Speed:	35	MC =	0.1	% of Design Hour Volume

Facility: Hollywood Blvd, east of I-95				
Scenario: 2045 No Build				
Year:	2045	D =	50.8	%
		T24=	7.8	% of 24 Hour Volume
		Tpeak =	3.90	% of Design Hour Volume
		MT =	3.43	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	1170	HT =	3.69	% of Design Hour Volume
Demand Peak Hour Volume:	2479	B =	0.69	% of Design Hour Volume
Posted Speed:	35	MC =	0.44	% of Design Hour Volume

Facility: Pembroke Rd, west of I-95				
Scenario: 2045 No Build				
Year:	2045	D =	55.8	%
		T24=	3.11	% of 24 Hour Volume
		Tpeak =	1.55	% of Design Hour Volume
		MT =	1.07	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	1170	HT =	1.56	% of Design Hour Volume
Demand Peak Hour Volume:	2421	B =	0.47	% of Design Hour Volume
Posted Speed:	35	MC =	0.36	% of Design Hour Volume

Facility: Pembroke Rd, east of I-95				
Scenario: 2045 No Build				
Year:	2045	D =	55.9	%
		T24=	3.9	% of 24 Hour Volume
		Tpeak =	1.9	% of Design Hour Volume
		MT =	1.3	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	1910	HT =	2.0	% of Design Hour Volume
Demand Peak Hour Volume:	2255	B =	0.6	% of Design Hour Volume
Posted Speed:	40	MC =	0.4	% of Design Hour Volume

Traffic Data for Noise Studies

Federal Aid Number(s):	
FPID Number(s):	436903-1-22-02
State/Federal Route No.:	State Road 9 (SR 9)
Road Name:	Interstate 95 (I-95)
Project Description:	PD&E Study
Segment Description:	South of Hallandale Beach Blvd (SR 858) to North of Hollywood Blvd (SR 820)
Section Number:	
Mile Post To/From:	0.0 – 3.1

Facility: Hallandale Beach Blvd, west of I-95			
Scenario: 2045 No Build			
Year:	2045	D =	50.8 %
		T24=	5.2 % of 24 Hour Volume
		Tpeak =	2.6 % of Design Hour Volume
		MT =	3.3 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	730	HT =	1.7 % of Design Hour Volume
Demand Peak Hour Volume:	2288	B =	0.3 % of Design Hour Volume
Posted Speed:	35	MC =	0.4 % of Design Hour Volume

Facility: Hallandale Beach Blvd, east of I-95			
Scenario: 2045 No Build			
Year:	2045	D =	56.3 %
		T24=	2.67 % of 24 Hour Volume
		Tpeak =	1.33 % of Design Hour Volume
		MT =	1.68 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	2940	HT =	0.85 % of Design Hour Volume
Demand Peak Hour Volume:	2910	B =	0.13 % of Design Hour Volume
Posted Speed:	40	MC =	0.21 % of Design Hour Volume



APPENDIX B

Table 3.1 - Noise Monitoring Data and TNM 2.5 Validation Results

Table 3.1 - Noise Monitoring Data and TNM 2.5 Validation Results

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 / Road Name (Date)					Vehicles per Hour	Speed (mph)												
MS1-1	Holiday Home Estates / South of Hallandale Beach Boulevard and West of I-95 (November 5, 2020)	10:10 AM	10:20 AM	Eastbound	50	1,104	34.3	42	33.1	6	34.3	---	---	12	34.3	67.0	65.7	-1.3	YES
				Westbound		1,050	38.8	30	32.3	6	29.5	6	20.0	---	---				
		10:20 AM	10:30 AM	Eastbound		1,128	31.3	24	33.8	18	27.0	6	34.0	12	31.3	66.7	65.2	-1.5	YES
				Westbound		1,062	38.5	18	20.0	---	---	---	---	---	---				
		10:30 AM	10:40 AM	Eastbound		1,032	33.8	24	33.8	42	27.4	6	27.0	6	33.8	67.4	66.3	-1.1	YES
				Westbound		978	39.3	12	36.0	24	29.0	---	---	6	39.3				
MS1-2	Holiday Home Estates / South of Hallandale Beach Boulevard and West of I-95 (November 5, 2020)	10:10 AM	10:20 AM	Eastbound	100	1,104	34.3	42	33.1	6	34.3	---	---	12	34.3	64.2	61.7	-2.5	YES
				Westbound		1,050	38.8	30	32.3	6	29.5	6	20.0	---	---				
		10:20 AM	10:30 AM	Eastbound		1,128	31.3	24	33.8	18	27.0	6	34.0	12	31.3	64.3	61.3	-3.0	YES
				Westbound		1,062	38.5	18	20.0	---	---	---	---	---	---				
		10:30 AM	10:40 AM	Eastbound		1,032	33.8	24	33.8	42	27.4	6	27.0	6	33.8	64.9	62.4	-2.5	YES
				Westbound		978	39.3	12	36.0	24	29.0	---	---	6	39.3				
MS2-1	Hollywood Little Ranches Subdivision / East of I-95 and South of Johnson Street (November 5, 2020)	12:30 PM	12:40 PM	Northbound	150	6,192	56.0	276	55.7	234	54.4	---	---	---	---	63.3	60.6	-2.7	YES
				Southbound		6,378	62.0	144	54.8	222	53.7	---	---	6	62.0				
		12:40 PM	12:50 PM	Northbound		6,102	54.8	234	54.3	240	51.4	---	---	12	54.8	63.2	60.6	-2.6	YES
				Southbound		6,186	62.5	186	57.0	246	58.0	---	---	12	62.5				
		12:50 PM	1:00 PM	Northbound		7,140	53.7	274	51.3	280	51.7	---	---	14	56.0	62.7	60.3	-2.4	YES
				Southbound		7,482	45.5	192	39.5	312	40.2	---	---	12	49.0				
MS2-2	Hollywood Little Ranches Subdivision / East of I-95 and South of Johnson Street (November 5, 2020)	12:30 PM	12:40 PM	Northbound	250	6,192	56.0	276	55.7	234	54.4	---	---	---	---	61.7	59.6	-2.1	YES
				Southbound		6,378	62.0	144	54.8	222	53.7	---	---	6	62.0				
		12:40 PM	12:50 PM	Northbound		6,102	54.8	234	54.3	240	51.4	---	---	12	54.8	61.3	59.6	-1.7	YES
				Southbound		6,186	62.5	186	57.0	246	58.0	---	---	12	62.5				
		12:50 PM	1:00 PM	Northbound		7,140	53.7	274	51.3	280	51.7	---	---	14	56.0	61.1	59.2	-1.9	YES
				Southbound		7,482	45.5	192	39.5	312	40.2	---	---	12	49.0				
MS3-1	Carver Heights Subdivision / South of Pembroke Road and East of I-95 (November 5, 2020)	5:40 PM	5:50 PM	Eastbound	50	1,182	31.4	6	16.0	---	---	---	---	---	---	64.7	64.0	-0.7	YES
				Westbound		1,410	34.5	18	31.0	12	31.0	6	31.0	6	33.0				
		5:50 PM	6:00 PM	Eastbound		1,260	34.9	6	34.9	---	---	---	---	6	28.0	64.6	64.8	0.2	YES
				Westbound		1,230	34.9	12	34.9	6	37.0	---	---	6	34.9				
		6:00 PM	6:10 PM	Eastbound		1,266	33.2	---	---	6	---	---	---	6	26.0	64.2	64.6	0.4	YES
				Westbound		1,176	36.2	12	32.0	6	---	6	32.0	---	---				
MS3-2	Carver Heights Subdivision / South of Pembroke Road and East of I-95 (November 5, 2020)	5:40 PM	5:50 PM	Eastbound	100	1,182	31.4	6	16.0	---	---	---	---	---	---	62.1	60.4	-1.7	YES
				Westbound		1,410	34.5	18	31.0	12	31.0	6	31.0	6	33.0				
		5:50 PM	6:00 PM	Eastbound		1,260	34.9	6	34.9	---	---	---	---	6	28.0	61.6	60.9	-0.7	YES
				Westbound		1,230	34.9	12	34.9	6	37.0	---	---	6	34.9				
		6:00 PM	6:10 PM	Eastbound		1,266	33.2	---	---	6	---	---	---	6	26.0	61.3	60.8	-0.5	YES
				Westbound		1,176	36.2	12	32.0	6	---	6	32.0	---	---				

X:\P\Noise_Studies\I-95_Hallandale_PDE\Noise_Monitoring\Table_3-1_I-95Hollywood_Noise Monitoring Data Summary_7-25-2021.xlsx\Table3-1_NSR

Minimum	61.1	59.2	-3.0
Maximum	67.4	66.3	0.4
Average Difference Between TNM 2.5 Predicted Levels and Monitored Levels			-1.6

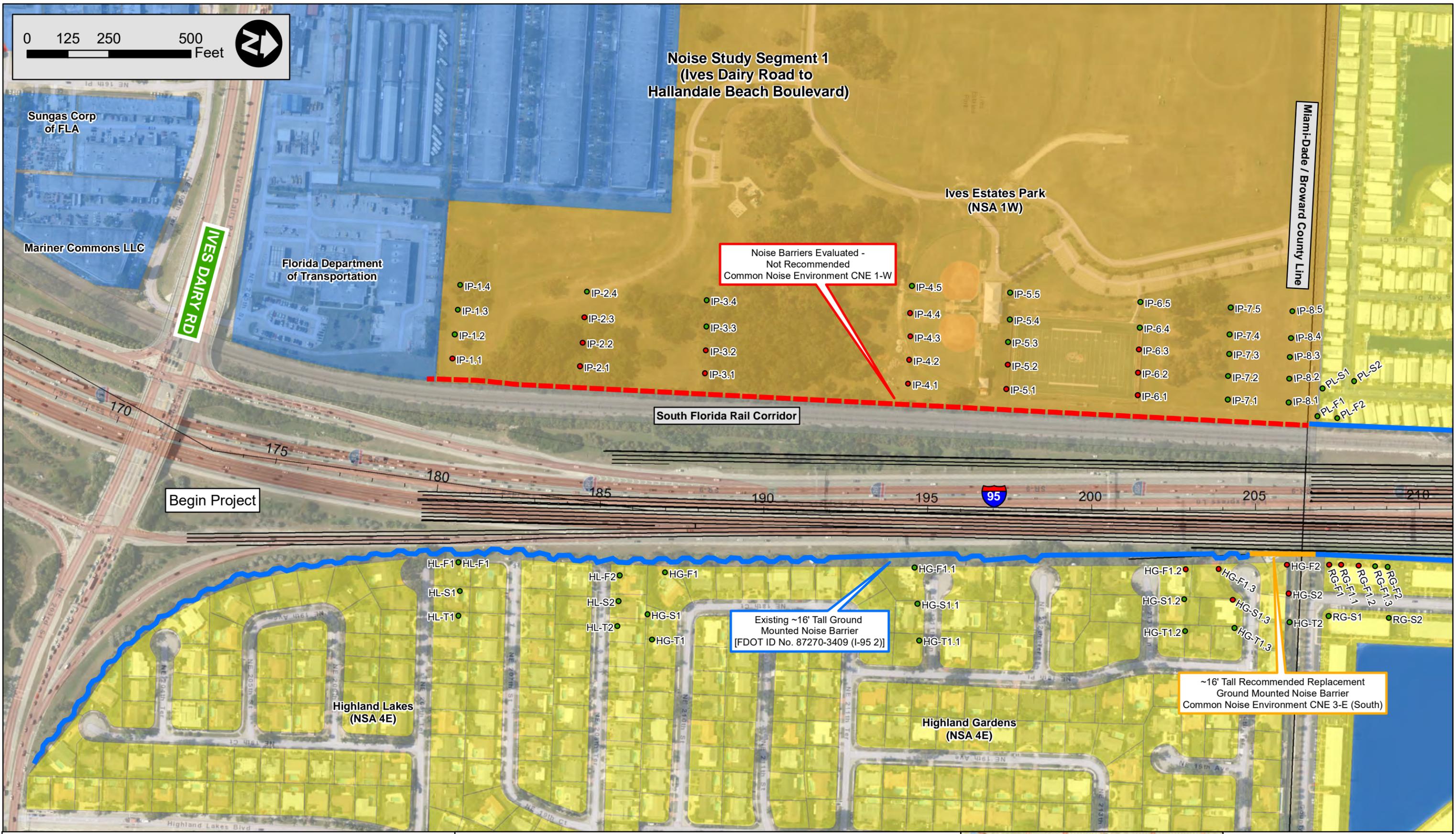


APPENDIX C

Figure 3.2 - Noise Analysis Map



**Noise Study Segment 1
(Ives Dairy Road to
Hallandale Beach Boulevard)**



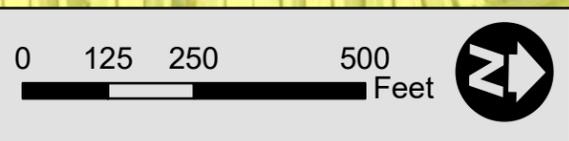
I-95 (SR 9) PD&E Study from
South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, Florida
FPID No. 436903-1-22-02



Predicted Noise Levels		Noise Barriers		Land Uses by Noise Activity Category	
●	≤ Noise Abatement Criteria	■	Existing Noise Barrier to Remain	■	B: Residential
●	> Noise Abatement Criteria	■	Replacement of Existing Noise Barrier	■	C: Other Sensitive Land Use
		■	Supplemental Noise Barrier (Existing)	■	D: Institutional (Interior)
		■	Recommended Noise Barrier (New)	■	E: Sensitive Commercial
		■	Not Recommended Noise Barrier	■	F: Non-Sensitive Developed
				■	G: Vacant
				—	Proposed Improvements



**FIGURE 3.2
NOISE ANALYSIS MAP
Sheet 1 of 7**



**Noise Study Segment 1
(Ives Dairy Road to
Hallandale Beach Boulevard)**

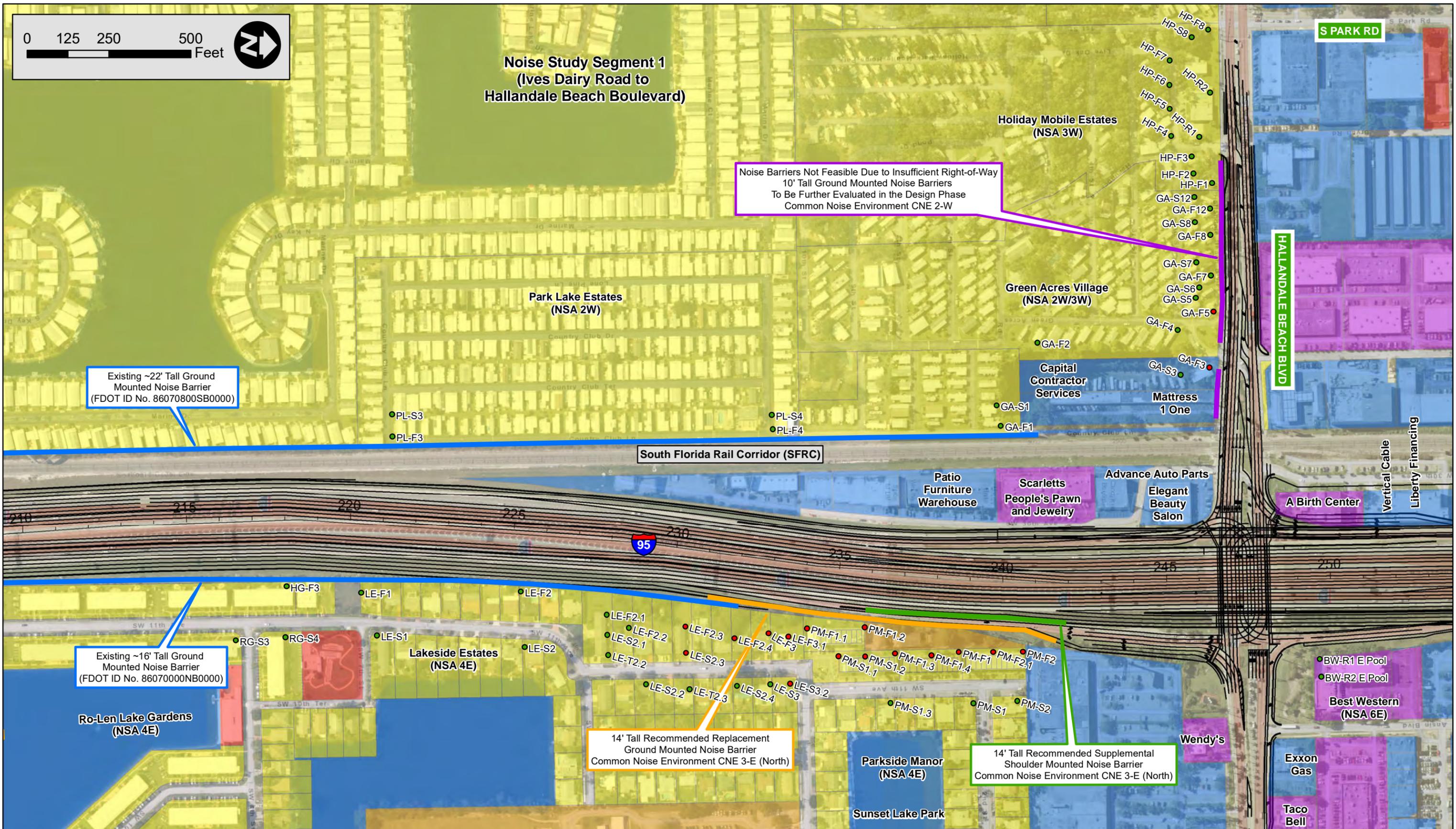
Noise Barriers Not Feasible Due to Insufficient Right-of-Way
10' Tall Ground Mounted Noise Barriers
To Be Further Evaluated in the Design Phase
Common Noise Environment CNE 2-W

Existing ~22' Tall Ground
Mounted Noise Barrier
(FDOT ID No. 86070800SB0000)

Existing ~16' Tall Ground
Mounted Noise Barrier
(FDOT ID No. 86070000NB0000)

14' Tall Recommended Replacement
Ground Mounted Noise Barrier
Common Noise Environment CNE 3-E (North)

14' Tall Recommended Supplemental
Shoulder Mounted Noise Barrier
Common Noise Environment CNE 3-E (North)



I-95 (SR 9) PD&E Study from
South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, Florida
FPID No. 436903-1-22-02



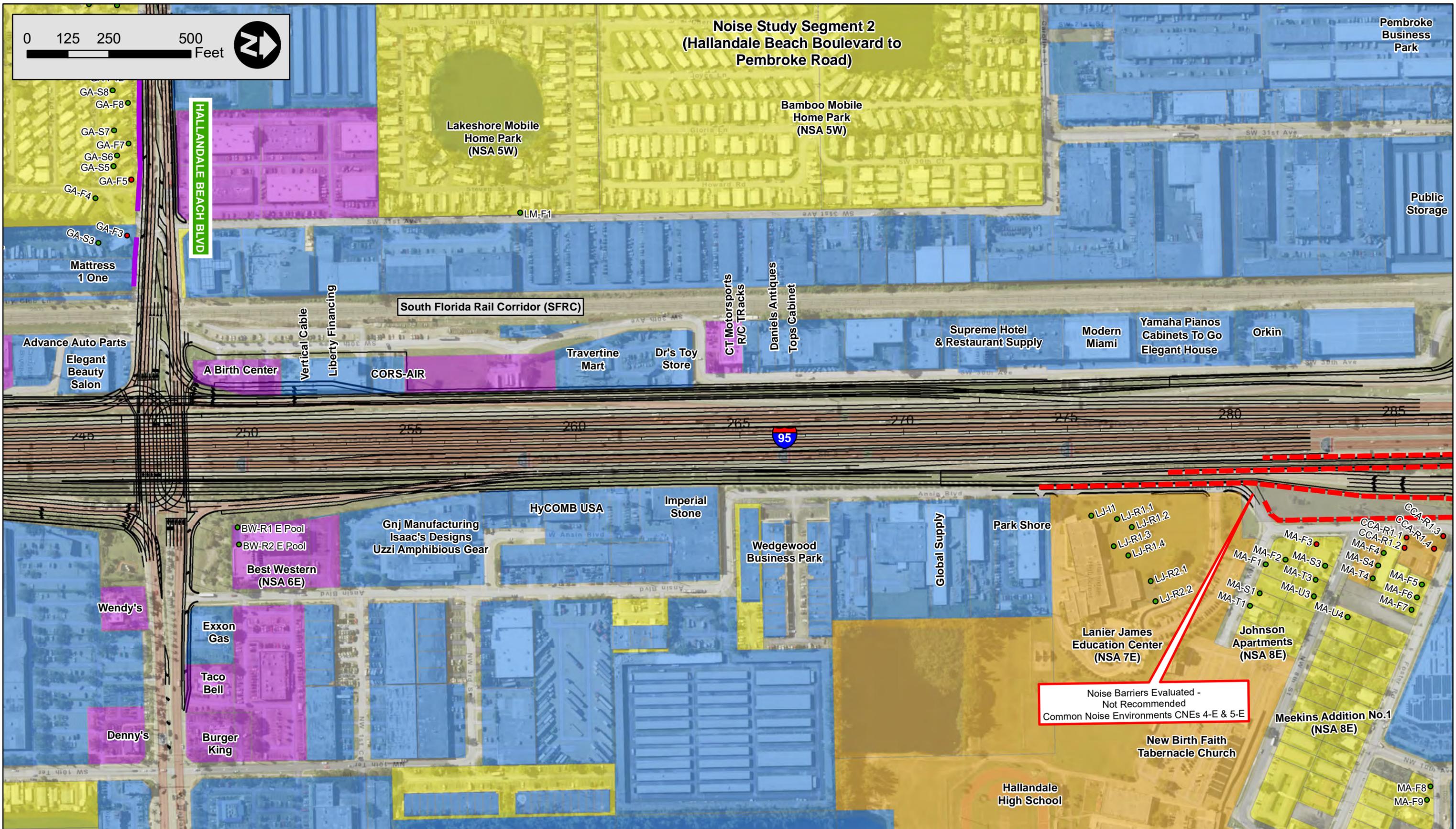
Predicted Noise Levels		Noise Barriers		Land Uses by Noise Activity Category	
●	≤ Noise Abatement Criteria	■	Existing Noise Barrier to Remain	■	B: Residential
●	> Noise Abatement Criteria	■	Replacement of Existing Noise Barrier	■	C: Other Sensitive Land Use
		■	Supplemental Noise Barrier (Existing)	■	D: Institutional (Interior)
		■	Recommended Noise Barrier (New)	■	E: Sensitive Commercial
		■	Not Recommended Noise Barrier	■	F: Non-Sensitive Developed
				■	G: Vacant
				—	Proposed Improvements



**FIGURE 3.2
NOISE ANALYSIS MAP
Sheet 2 of 7**



Noise Study Segment 2 (Hallandale Beach Boulevard to Pembroke Road)



I-95 (SR 9) PD&E Study from
South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, Florida
FPID No. 436903-1-22-02



Predicted Noise Levels		Noise Barriers		Land Uses by Noise Activity Category	
●	≤ Noise Abatement Criteria	■	Existing Noise Barrier to Remain	■	B: Residential
●	> Noise Abatement Criteria	■	Replacement of Existing Noise Barrier	■	C: Other Sensitive Land Use
		■	Supplemental Noise Barrier (Existing)	■	D: Institutional (Interior)
		■	Recommended Noise Barrier (New)	■	E: Sensitive Commercial
		■	Not Recommended Noise Barrier	■	F: Non-Sensitive Developed
				■	G: Vacant
				—	Proposed Improvements

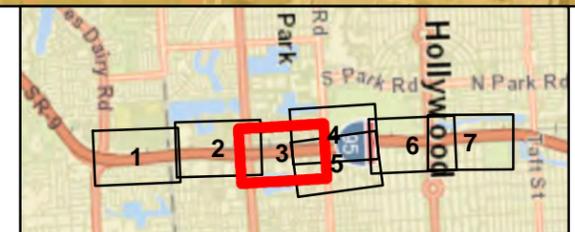
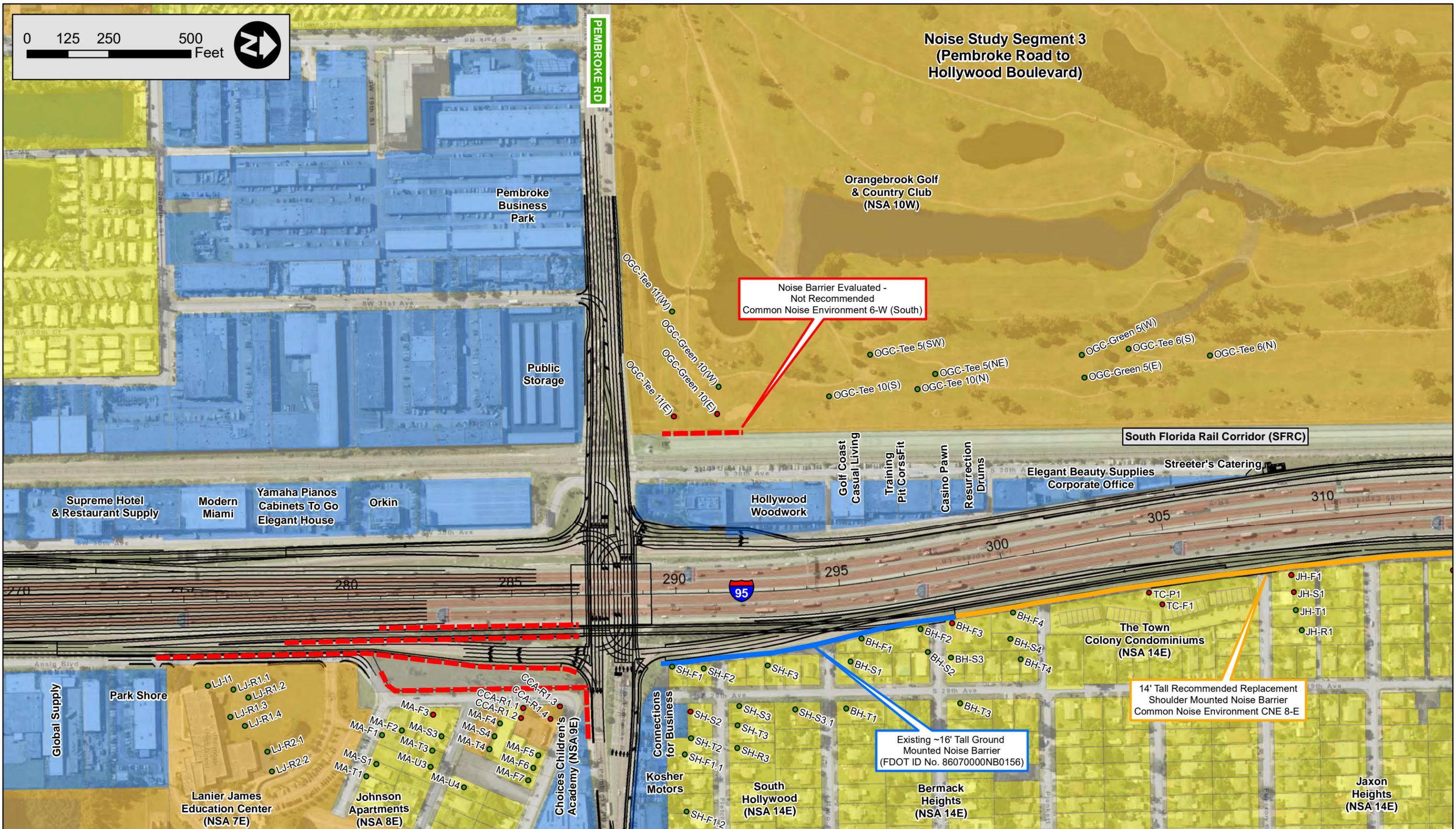


FIGURE 3.2
NOISE ANALYSIS MAP
Sheet 3 of 7

0 125 250 500 Feet



Noise Study Segment 3
(Pembroke Road to Hollywood Boulevard)



Noise Barrier Evaluated -
Not Recommended
Common Noise Environment 6-W (South)

South Florida Rail Corridor (SFRC)

14' Tall Recommended Replacement
Shoulder Mounted Noise Barrier
Common Noise Environment CNE 8-E

Existing ~16' Tall Ground
Mounted Noise Barrier
(FDOT ID No. 86070000NB0156)

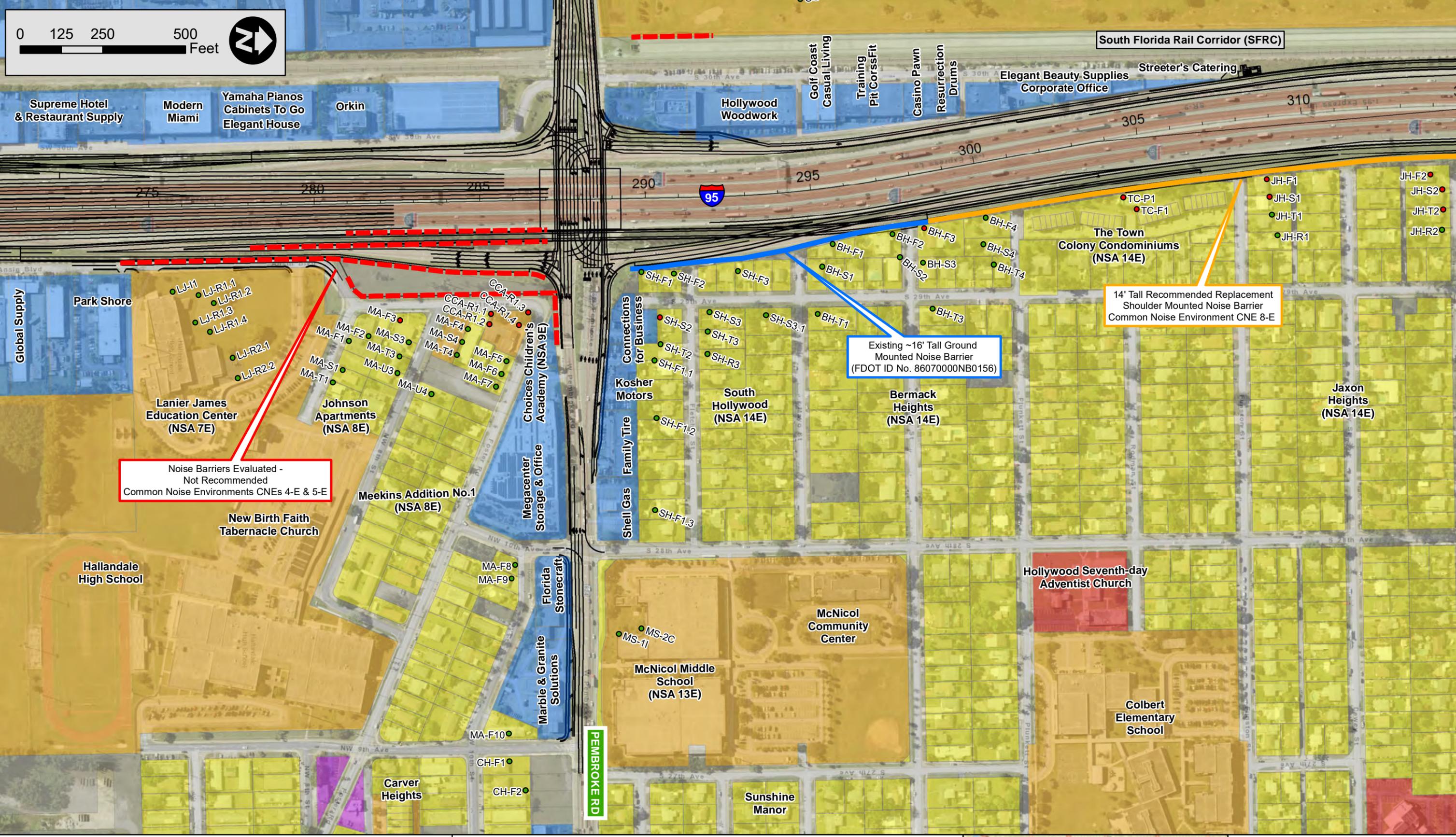
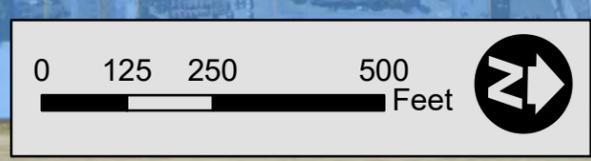
I-95 (SR 9) PD&E Study from
South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, Florida
FPID No. 436903-1-22-02



Predicted Noise Levels		Noise Barriers		Land Uses by Noise Activity Category	
●	≤ Noise Abatement Criteria	—	Existing Noise Barrier to Remain	■	B: Residential
●	> Noise Abatement Criteria	—	Replacement of Existing Noise Barrier	■	C: Other Sensitive Land Use
		—	Supplemental Noise Barrier (Existing)	■	D: Institutional (Interior)
		—	Recommended Noise Barrier (New)	■	E: Sensitive Commercial
		—	Not Recommended Noise Barrier	■	F: Non-Sensitive Developed
				■	G: Vacant
				—	Proposed Improvements



FIGURE 3.2
NOISE ANALYSIS MAP
Sheet 4 of 7



Noise Barriers Evaluated - Not Recommended
Common Noise Environments CNEs 4-E & 5-E

Existing ~16' Tall Ground Mounted Noise Barrier
(FDOT ID No. 86070000NB0156)

14' Tall Recommended Replacement
Shoulder Mounted Noise Barrier
Common Noise Environment CNE 8-E

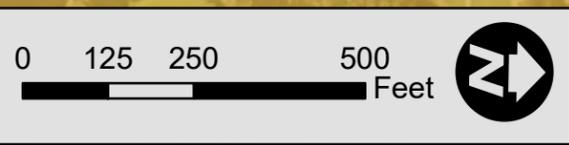
I-95 (SR 9) PD&E Study from South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820) Broward County, Florida
FPID No. 436903-1-22-02



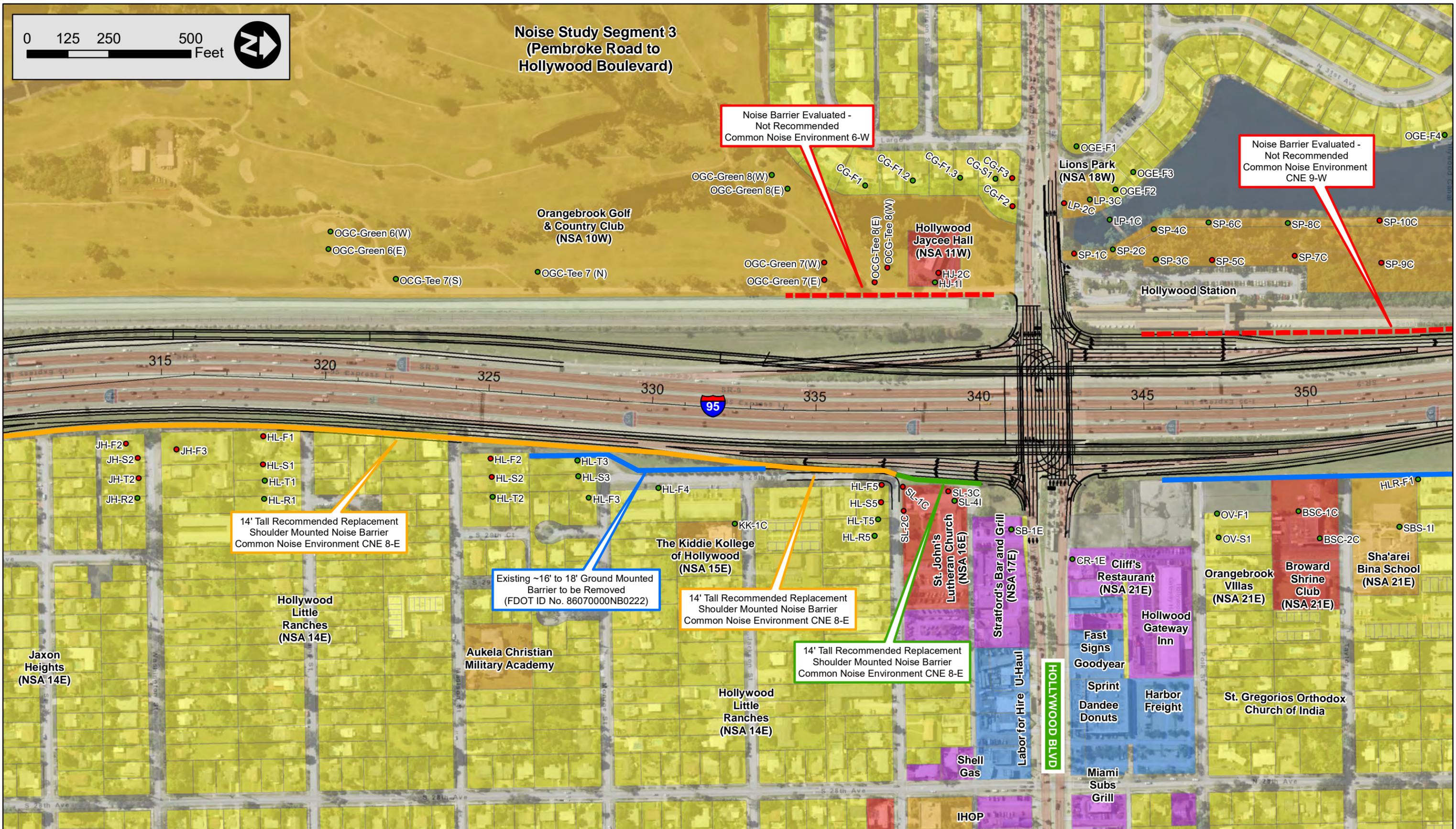
Predicted Noise Levels		Noise Barriers		Land Uses by Noise Activity Category	
●	≤ Noise Abatement Criteria	■	Existing Noise Barrier to Remain	■	B: Residential
●	> Noise Abatement Criteria	■	Replacement of Existing Noise Barrier	■	C: Other Sensitive Land Use
		■	Supplemental Noise Barrier (Existing)	■	D: Institutional (Interior)
		■	Recommended Noise Barrier (New)	■	E: Sensitive Commercial
		■	Not Recommended Noise Barrier	■	F: Non-Sensitive Developed
				■	G: Vacant
				—	Proposed Improvements



FIGURE 3.2
NOISE ANALYSIS MAP
Sheet 5 of 7



**Noise Study Segment 3
(Pembroke Road to
Hollywood Boulevard)**



I-95 (SR 9) PD&E Study from
South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, Florida
FPID No. 436903-1-22-02



Predicted Noise Levels		Noise Barriers		Land Uses by Noise Activity Category	
●	≤ Noise Abatement Criteria	—	Existing Noise Barrier to Remain	■	B: Residential
●	> Noise Abatement Criteria	—	Replacement of Existing Noise Barrier	■	C: Other Sensitive Land Use
		—	Supplemental Noise Barrier (Existing)	■	D: Institutional (Interior)
		—	Recommended Noise Barrier (New)	■	E: Sensitive Commercial
		—	Not Recommended Noise Barrier	■	F: Non-Sensitive Developed
				■	G: Vacant
				—	Proposed Improvements



**FIGURE 3.2
NOISE ANALYSIS MAP
Sheet 6 of 7**



APPENDIX D

Table 3.3 - Location and Description of Representative Receptor Sites and Noise Analysis Results

Table 3.3 - Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 1 of 7)

Name of Noise Sensitive Area/Site	Representative Noise Receptor Site Designation	Noise Sensitive Site Description	Number of Noise Sensitive Sites Represented	Noise Abatement Activity Category - Criteria	TNM Predicted Noise Levels (dBA)		Difference Between Existing Conditions and Build Alternative	Noise Abatement Criteria Status / Consideration of Noise Abatement Warranted? Yes or No	Common Noise Environment (CNE) Identification Number / Comments
					Existing / No Build Conditions	Build Alternative (Design Year 2045)			
North of Ives Dairy Road to Hallandale Beach Boulevard - Noise Study Segment Number 1 / Noise Study Areas - NSA 1W through NSA 4E									
Noise Study Area 1W (Segment Number 1 - Ives Dairy Road to Hallandale Beach Boulevard) See Figure 3.2 Sheet 1									
Ives Estates Park - West of I-95 between Ives Dairy Road and Miami-Dade/Broward County Line (NSA 1W)	IP-1.1	Passive Recreational	1 (Special Land Use)	Recreational NAC C - 66 dB(A)	67.2	66.4	-0.8	Approaches / Yes	CNE 1-W
	IP-1.2	Passive Recreational	1 (Special Land Use)		65.3	64.4	-0.9	Below / No	
	IP-1.3	Passive Recreational	1 (Special Land Use)		63.7	62.5	-1.2	Below / No	
	IP-1.4	Passive Recreational	1 (Special Land Use)		62.4	61.1	-1.3	Below / No	
	IP-2.1	Passive Recreational	1 (Special Land Use)		68.7	69.7	1.0	Exceeds / Yes	
	IP-2.2	Passive Recreational	1 (Special Land Use)		67.0	67.3	0.3	Exceeds / Yes	
	IP-2.3	Passive Recreational	1 (Special Land Use)		66.0	66.2	0.2	Approaches / Yes	
	IP-2.4	Passive Recreational	1 (Special Land Use)		64.2	63.3	-0.9	Below / No	
	IP-3.1	Passive Recreational	1 (Special Land Use)		68.8	69.7	0.9	Exceeds / Yes	
	IP-3.2	Passive Recreational	1 (Special Land Use)		67.3	67.4	0.1	Exceeds / Yes	
	IP-3.3	Passive Recreational	1 (Special Land Use)		66.4	65.9	-0.5	Below / No	
	IP-3.4	Passive Recreational	1 (Special Land Use)		65.1	64.3	-0.8	Below / No	
	IP-4.1	Baseball Field	1 (Special Land Use)		71.5	72.7	1.2	Exceeds / Yes	
	IP-4.2	Baseball Field	1 (Special Land Use)		69.8	70.1	0.3	Exceeds / Yes	
	IP-4.3	Baseball Field	1 (Special Land Use)		68.3	68.1	-0.2	Exceeds / Yes	
	IP-4.4	Baseball Field	1 (Special Land Use)		67.0	66.5	-0.5	Approaches / Yes	
	IP-4.5	Baseball Field	1 (Special Land Use)		65.5	64.6	-0.9	Below / No	
	IP-5.1	Football Field	1 (Special Land Use)		70.8	69.7	-1.1	Exceeds / Yes	
	IP-5.2	Football Field	1 (Special Land Use)		68.8	67.6	-1.2	Exceeds / Yes	
	IP-5.3	Football Field	1 (Special Land Use)		66.6	65.8	-0.8	Below / No	
	IP-5.4	Football Field	1 (Special Land Use)		64.7	64.3	-0.4	Below / No	
	IP-5.5	Football Field	1 (Special Land Use)		65.0	63.1	-1.9	Below / No	
	IP-6.1	Football Field	1 (Special Land Use)		66.7	69.5	2.8	Exceeds / Yes	
	IP-6.2	Football Field	1 (Special Land Use)		70.2	68.7	-1.5	Exceeds / Yes	
	IP-6.3	Football Field	1 (Special Land Use)		68.0	66.3	-1.7	Approaches / Yes	
	IP-6.4	Football Field	1 (Special Land Use)		62.3	64.2	1.9	Below / No	
	IP-6.5	Football Field	1 (Special Land Use)		65.8	63.9	-1.9	Below / No	
	IP-7.1	Soccer Field	1 (Special Land Use)		63.6	65.8	2.2	Below / No	
	IP-7.2	Soccer Field	1 (Special Land Use)		62.8	64.7	1.9	Below / No	
	IP-7.3	Soccer Field	1 (Special Land Use)		61.5	63.3	1.8	Below / No	
IP-7.4	Soccer Field	1 (Special Land Use)	60.9	63.1	2.2	Below / No			
IP-7.5	Soccer Field	1 (Special Land Use)	59.9	61.9	2.0	Below / No			
IP-8.1	Soccer Field	1 (Special Land Use)	63.2	64.8	1.6	Below / No			
IP-8.2	Soccer Field	1 (Special Land Use)	61.8	63.7	1.9	Below / No			
IP-8.3	Soccer Field	1 (Special Land Use)	60.3	62.2	1.9	Below / No			
IP-8.4	Soccer Field	1 (Special Land Use)	59.6	61.7	2.1	Below / No			
IP-8.5	Soccer Field	1 (Special Land Use)	58.6	60.7	2.1	Below / No			
				Minimum	58.6	60.7	2.1	---	---
				Maximum	71.5	72.7	1.2	---	---
				Average	65.3	65.5	0.3	---	---
Total Number of Non-Residential / Special Land Use Receptor Sites Equal to or Greater than the Noise Abatement Criteria (NAC)					17	15	-2	---	---
Noise Study Area 2W (Segment Number 1 - Ives Dairy Road to Hallandale Beach Boulevard) See Figure 3.2 Sheets 1 and 2									
Park Lake Estates / Green Acres Village - West of I-95 between Miami-Dade/Broward County Line and South of Hallandale Beach Boulevard (NSA 2W)	PL-F1	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	57.8	59.5	1.7	Below / No	---
	PL-S1	Second Row Single Family Residence	1		59.6	60.7	1.1	Below / No	
	PL-F2	First Row Single Family Residence	32		55.9	58.3	2.4	Below / No	
	PL-S2	Second Row Single Family Residence	29		59.1	60.6	1.5	Below / No	
	PL-F3	First Row Single Family Residence	14		58.2	59.7	1.5	Below / No	
	PL-S3	Second Row Single Family Residence	15		58.1	59.5	1.4	Below / No	
	PL-F4	First Row Single Family Residence	15		55.9	56.8	0.9	Below / No	
	PL-S4	Second Row Single Family Residence	15		56.0	57.7	1.7	Below / No	
	GA-F1	First Row Single Family Residence	5		54.0	53.4	-0.6	Below / No	
	GA-S1	Second Row Single Family Residence	5		56.3	55.4	-0.9	Below / No	
	GA-F2	First Row Single Family Residence	9		57.7	56.1	-1.6	Below / No	
					Minimum	54.0	53.4	-0.6	
				Maximum	59.6	60.7	1.1	---	---
				Average	57.1	58.0	0.8	---	---
Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)					0	0	0	---	---

Table 3.3 - Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 2 of 7)

Name of Noise Sensitive Area/Site	Representative Noise Receptor Site Designation	Noise Sensitive Site Description	Number of Noise Sensitive Sites Represented	Noise Abatement Activity Category - Criteria	TNM Predicted Noise Levels (dBA)		Difference Between Existing Conditions and Build Alternative	Noise Abatement Criteria Status / Consideration of Noise Abatement Warranted? Yes or No	Common Noise Environment (CNE) Identification Number / Comments
					Existing / No Build Conditions	Build Alternative (Design Year 2045)			
Noise Study Area 3W (Segment Number 1 - Ives Dairy Road to Hallandale Beach Boulevard) See Figure 3.2 Sheet 2									
Green Acres Village / Holiday Mobile Estates - West of I-95 between Miami-Dade/Broward County Line and South of Hallandale Beach Boulevard (NSA 3W)	GA-F3	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	66.3	66.8	0.5	Approaches / Yes	CNE 2-W
	GA-S3	Second Row Single Family Residence	1		58.3	58.8	0.5	Below / No	
	GA-F4	First Row Single Family Residence	1		60.8	60.9	0.1	Below / No	
	GA-F5	First Row Single Family Residence	2		66.5	67.2	0.7	Exceeds / Yes	
	GA-S5	Second Row Single Family Residence	1		63.7	64.2	0.5	Below / No	
	GA-S6	Second Row Single Family Residence	1		63.4	63.9	0.5	Below / No	
	GA-F7	First Row Single Family Residence	3		65.1	65.8	0.7	Below / No	
	GA-S7	Second Row Single Family Residence	3		62.7	63.1	0.4	Below / No	
	GA-F8	First Row Single Family Residence	2		65.0	65.7	0.7	Below / No	
	GA-S8	Second Row Single Family Residence	2		62.2	62.6	0.4	Below / No	
	GA-F9	First Row Single Family Residence	2		65.0	65.6	0.6	Below / No	
	GA-S9	Second Row Single Family Residence	2		62.2	62.3	0.1	Below / No	
	HP-F1	First Row Single Family Residence	1		65.4	65.4	0.0	Below / No	
	HP-F2	First Row Single Family Residence	2		62.0	62.0	0.0	Below / No	
	HP-F3	First Row Single Family Residence	1		62.1	62.1	0.0	Below / No	
	HP-F4	First Row Single Family Residence	2		59.2	59.0	-0.2	Below / No	
	HP-F5	First Row Single Family Residence	2		59.1	58.5	-0.6	Below / No	
	HP-F6	First Row Single Family Residence	2		58.7	58.3	-0.4	Below / No	
	HP-F7	First Row Single Family Residence	1		58.8	58.5	-0.3	Below / No	
	HP-F8	First Row Single Family Residence	1		64.8	64.8	0.0	Below / No	
HP-S8	Second Row Single Family Residence	1	61.4	61.3	-0.1	Below / No			
HP-R1	Community Pool	---	62.2	62.2	0.0	Below / No			
HP-R2	Community Playground	---	65.4	65.3	-0.1	Below / No			
Minimum					58.3	58.3	0.0	---	---
Maximum					66.5	67.2	0.7	---	---
Average					62.6	62.8	0.2	---	---
Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)					3	3	0	---	---
Noise Study Area 4E (Segment Number 1 - Ives Dairy Road to Hallandale Beach Boulevard) See Figure 3.2 Sheets 1 and 2									
Highland Lakes, Highland Gardens, Ro-Len Lake Gardens, Lakeside Estates, Parkside Manor - East of I-95 between Ives Dairy Road and Hallandale Beach Boulevard (NSA 4E)	HL-F1	First Row Single Family Residence	3	Residential NAC B - 66 dB(A)	62.0	62.8	0.8	Below / No	CNE 3-E
	HL-S1	Second Row Single Family Residence	3		60.0	61.0	1.0	Below / No	
	HL-T1	Third Row Single Family Residence	3		58.2	59.2	1.0	Below / No	
	HL-F2	First Row Single Family Residence	3		63.6	63.5	-0.1	Below / No	
	HL-S2	Second Row Single Family Residence	3		60.4	60.7	0.3	Below / No	
	HL-T2	Third Row Single Family Residence	3		58.7	59.2	0.5	Below / No	
	HG-F1	First Row Single Family Residence	8		63.6	63.4	-0.2	Below / No	
	HG-S1	Second Row Single Family Residence	6		60.0	60.4	0.4	Below / No	
	HG-T1	Third Row Single Family Residence	6		57.6	58.3	0.7	Below / No	
	HG-F1.1	First Row Single Family Residence	1		65.5	65.8	0.3	Below / No	
	HG-S1.1	Second Row Single Family Residence	5		61.0	61.9	0.9	Below / No	
	HG-T1.1	Third Row Single Family Residence	5		58.2	59.1	0.9	Below / No	
	HG-F1.2	First Row Single Family Residence	1		64.9	66.4	1.5	Approaches / Yes	
	HG-S1.2	Second Row Single Family Residence	1		59.4	61.3	1.9	Below / No	
	HG-T1.2	Third Row Single Family Residence	2		57.8	59.3	1.5	Below / No	
	HG-F1.3	First Row Single Family Residence	1		64.8	68.2	3.4	Exceeds / Yes	
	HG-S1.3	Second Row Single Family Residence	1		61.1	66.0	4.9	Approaches / Yes	
	HG-T1.3	Third Row Single Family Residence	1		57.6	61.7	4.1	Below / No	
	HG-F2	First Row Single Family Residence	1		64.9	77.9	13.0	Exceeds / Yes	
	HG-S2	Second Row Single Family Residence	1		60.3	68.0	7.7	Exceeds / Yes	
	HG-T2	Third Row Single Family Residence	1		58.3	63.5	5.2	Below / No	
	RG-F1	First Row Multi-Family Residence	2		63.2	69.7	6.5	Exceeds / Yes	
	RG-F1.1	First Row Multi-Family Residence	2		63.2	67.8	4.6	Exceeds / Yes	
	RG-F1.2	First Row Multi-Family Residence	2		63.0	66.4	3.4	Approaches / Yes	
	RG-F1.3	First Row Multi-Family Residence	2		62.8	65.8	3.0	Below / No	
	RG-F2	First Row Multi-Family Residence	2		62.7	65.5	2.8	Below / No	
	RG-S1	Second Row Multi-Family Residence	2		59.0	64.0	5.0	Below / No	
	RG-S2	Second Row Multi-Family Residence	8		58.9	60.6	1.7	Below / No	
	HG-F3	First Row Multi-Family Residence	42		61.3	63.8	2.5	Below / No	
	RG-S3	Second Row Multi-Family Residence	30		58.3	59.7	1.4	Below / No	
	RG-S4	Second Row Multi-Family Residence	2		58.9	60.2	1.3	Below / No	
	LE-F1	First Row Single Family Residence	8		62.9	65.0	2.1	Below / No	
	LE-S1	Second Row Single Family Residence	7		58.6	59.9	1.3	Below / No	
LE-F2	First Row Single Family Residence	9	62.2	64.6	2.4	Below / No			
LE-S2	Second Row Single Family Residence	10	57.9	59.1	1.2	Below / No			
LE-F2.1	First Row Multi-Family Residence	1	63.8	65.6	1.8	Below / No			
LE-S2.1	Second Row Multi-Family Residence	2	61.7	63.8	2.1	Below / No			

Table 3.3 - Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 3 of 7)

Name of Noise Sensitive Area/Site	Representative Noise Receptor Site Designation	Noise Sensitive Site Description	Number of Noise Sensitive Sites Represented	Noise Abatement Activity Category - Criteria	TNM Predicted Noise Levels (dBA)		Difference Between Existing Conditions and Build Alternative	Noise Abatement Criteria Status / Consideration of Noise Abatement Warranted? Yes or No	Common Noise Environment (CNE) Identification Number / Comments
					Existing / No Build Conditions	Build Alternative (Design Year 2045)			
Highland Lakes, Highland Gardens, Ro-Len Lake Gardens, Lakeside Estates, Parkside Manor - East of I-95 between Ives Dairy Road and Hallandale Beach Boulevard (NSA 4E Continued)	LE-T2.2	Third Row Multi-Family Residence	1	Residential NAC B - 66 dB(A)	59.7	60.8	1.1	Below / No	CNE 3-E (Continued)
	LE-F2.2	First Row Multi-Family Residence	3		63.5	65.7	2.2	Below / No	
	LE-S2.2	Second Row Multi-Family Residence	4		58.2	60.0	1.8	Below / No	
	LE-F2.3	First Row Multi-Family Residence	4		63.8	67.0	3.2	Exceeds / Yes	
	LE-S2.3	Second Row Multi-Family Residence	4		61.6	66.1	4.5	Approaches / Yes	
	LE-T2.3	Third Row Multi-Family Residence	2		59.3	61.5	2.2	Below / No	
	LE-F2.4	First Row Multi-Family Residence	2		63.9	70.1	6.2	Exceeds / Yes	
	LE-S2.4	Second Row Multi-Family Residence	2		59.2	62.2	3.0	Below / No	
	LE-F3	First Row Multi-Family Residence	1		64.0	74.4	10.4	Exceeds / Yes	
	LE-S3	Second Row Multi-Family Residence	10		60.6	64.7	4.1	Below / No	
	LE-F3.1	First Row Multi-Family Residence	1		64.4	75.6	11.2	Exceeds / Yes	
	LE-S3.2	Second Row Multi-Family Residence	1		60.9	66.2	5.3	Approaches / Yes	
	PM-F1.1	First Row Multi-Family Residence	5		64.1	76.1	12.0	Exceeds / Yes	
	PM-F1.2	First Row Multi-Family Residence	5		63.9	73.7	9.8	Exceeds / Yes	
	PM-S1.1	Second Row Multi-Family Residence	2		63.1	67.5	4.4	Exceeds / Yes	
	PM-S1.2	Second Row Multi-Family Residence	4		64.3	69.9	5.6	Exceeds / Yes	
	PM-F1.3	First Row Multi-Family Residence	4		65.1	71.3	6.2	Exceeds / Yes	
	PM-S1.3	Second Row Multi-Family Residence	4		60.5	62.7	2.2	Below / No	
	PM-F1.4	First Row Multi-Family Residence	4		65.2	70.8	5.6	Exceeds / Yes	
	PM-F1	First Row Multi-Family Residence	4		64.7	71.0	6.3	Exceeds / Yes	
	PM-S1	Second Row Multi-Family Residence	4		60.9	63.5	2.6	Below / No	
PM-F2.1	First Row Multi-Family Residence	4	63.3	70.6	7.3	Exceeds / Yes			
PM-F2	First Row Multi-Family Residence	2	63.7	70.5	6.8	Exceeds / Yes			
PM-S2	Second Row Multi-Family Residence	1	61.5	63.2	1.7	Below / No			
Minimum					57.6	58.3	0.7	---	---
Maximum					65.5	77.9	12.4	---	---
Average					61.6	65.2	3.6	---	---
Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)					0	58	58	---	---
Noise Study Area 5W (Segment Number 2 - Hallandale Beach Boulevard to Pembroke Road) See Figure 3.2 Sheet 3									
Lakeshore and Bamboo Mobile Home Parks - West of I-95 and North of Hallandale Beach Boulevard (NSA 5W)	LM-F1	First Row Single Family Residence	3	Residential NAC B - 66 dB(A)	54.5	56.6	2.1	Below / No	---
Noise Study Area 6E (Segment Number 2 - Hallandale Beach Boulevard to Pembroke Road) See Figure 3.2 Sheet 3									
Best Western Hotel Pool - East of I-95 and North of Hallandale Beach Boulevard (NSA 6E)	BW-R1	Hotel Pool West End	3	Sensitive Commercial NAC E - 71 dB(A)	68.6	67.4	-1.2	Below / No	---
	BW-R2	Hotel Pool East End	3	Sensitive Commercial NAC E - 71 dB(A)	66.6	64.9	-1.7	Below / No	---
Noise Study Area 7E (Segment Number 2 - Hallandale Beach Boulevard to Pembroke Road) See Figure 3.2 Sheets 3 and 5									
Lanier James Education Center - East of I-95 and South of Pembroke Road (NSA 7E)	LJ-I1	School Interior Use	1 (Special Land Use)	Institutional Interior NAC D - 51 dB(A)	49.0	37.8	-11.2	Below / No	---
	LJ-R1.1	Basketball Court	1 (Special Land Use)	Recreational NAC C - 66 dB(A)	73.5	63.6	-9.9	Below / No	---
	LJ-R1.2	Basketball Court	1 (Special Land Use)		73.3	64.3	-9.0	Below / No	---
	LJ-R1.3	Basketball Court	1 (Special Land Use)		70.5	63.1	-7.4	Below / No	---
	LJ-R1.4	Basketball Court	1 (Special Land Use)		70.7	63.6	-7.1	Below / No	---
	LJ-R2.1	School Playground	1 (Special Land Use)		68.5	62.9	-5.6	Below / No	---
	LJ-R2.2	School Playground	1 (Special Land Use)		67.0	62.1	-4.9	Below / No	---
Minimum					49.0	37.8	-11.2	---	---
Maximum					73.5	64.3	-9.2	---	---
Average					67.5	59.6	-7.9	---	---
Total Number of Non-Residential / Special Land Use Receptor Sites Equal to or Greater than the Noise Abatement Criteria (NAC)					6	0	-6	---	---
Noise Study Area 8E (Segment Number 2 - Hallandale Beach Boulevard to Pembroke Road) See Figure 3.2 Sheet 5									
Johnson Apartments, Meekins Addition No. 1, Carver Heights - East of I-95 and South of Pembroke Road (NSA 8E)	MA-F1	First Row Multi-Family Residence (Johnson Apartments)	1	Residential NAC B - 66 dB(A)	68.3	64.0	-4.3	Below / No	CNE 4-E
	MA-F2	First Row Multi-Family Residence (Johnson Apartments)	1		67.2	63.6	-3.6	Below / No	
	MA-S1	Second Row Single Family Residence	1		66.3	61.9	-4.4	Below / No	
	MA-T1	Third Row Single Family Residence	1		66.3	61.9	-4.4	Below / No	
	MA-F3	First Row Single Family Residence	2		70.1	67.0	-3.1	Exceeds / Yes	
	MA-S3	Second Row Single Family Residence	1		64.3	62.4	-1.9	Below / No	
	MA-T3	Third Row Single Family Residence	1		63.0	61.1	-1.9	Below / No	
	MA-U3	Fourth Row Single Family Residence	1		63.6	61.4	-2.2	Below / No	
	MA-F4	First Row Single Family Residence	1		67.9	65.1	-2.8	Below / No	
	MA-S4	Second Row Single Family Residence	4		67.4	64.3	-3.1	Below / No	
	MA-T4	Third Row Single Family Residence	3		67.1	63.8	-3.3	Below / No	
	MA-U4	Fourth Row Single Family Residence	1		65.2	62.3	-2.9	Below / No	
	MA-F5	First Row Multi-Family Residence	2		65.2	64.0	-1.2	Below / No	
	MA-F6	First Row Multi-Family Residence	2		64.5	63.3	-1.2	Below / No	
MA-F7	First Row Multi-Family Residence	2	63.5	62.4	-1.1	Below / No			

Table 3.3 - Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 4 of 7)

Name of Noise Sensitive Area/Site	Representative Noise Receptor Site Designation	Noise Sensitive Site Description	Number of Noise Sensitive Sites Represented	Noise Abatement Activity Category - Criteria	TNM Predicted Noise Levels (dBA)		Difference Between Existing Conditions and Build Alternative	Noise Abatement Criteria Status / Consideration of Noise Abatement Warranted? Yes or No	Common Noise Environment (CNE) Identification Number / Comments
					Existing / No Build Conditions	Build Alternative (Design Year 2045)			
Johnson Apartments, Meekins Addition No. 1, Carver Heights - East of I-95 and South of Pembroke Road (NSA 8E) Continued	MA-F8	First Row Multi-Family Residence	1	Residential NAC B - 66 dB(A)	61.2	60.6	-0.6	Below / No	CNE 4-E (Continued)
	MA-F9	First Row Multi-Family Residence	1		60.5	59.9	-0.6	Below / No	
	MA-F10	First Row Multi-Family Residence	1		60.3	58.9	-1.4	Below / No	
	CH-F1	First Row Multi-Family Residence	1		60.8	59.2	-1.6	Below / No	
	CH-F2	First Row Multi-Family Residence	1		63.5	62.1	-1.4	Below / No	
Minimum					60.3	58.9	-1.4	---	---
Maximum					70.1	67.0	-3.1	---	---
Average					64.8	62.5	-2.4	---	---
Total Number of Non-Residential / Special Land Use Receptor Sites Equal to or Greater than the Noise Abatement Criteria (NAC)					14	2	-12	---	---
Noise Study Area 9E (Segment Number 2 - Hallandale Beach Boulevard to Pembroke Road) See Figure 3.2 Sheet 5									
Choices Children's Academy Playground - East of I-95 and South of Pembroke Road (NSA 9E)	CCA-R1.1 (27)	School Playground	1 (Special Land Use)	Recreational NAC C - 66 dB(A)	68.6	67.4	-1.2	Exceeds / Yes	CNE 5-E
	CCA-R1.2 (28)	School Playground	1 (Special Land Use)		68.6	67.1	-1.5	Exceeds / Yes	
	CCA-R1.3 (29)	School Playground	1 (Special Land Use)		70.0	68.6	-1.4	Exceeds / Yes	
	CCA-R1.4 (30)	School Playground	1 (Special Land Use)		69.5	67.7	-1.8	Exceeds / Yes	
Minimum					68.6	67.1	-1.5	---	---
Maximum					70.0	68.6	-1.4	---	---
Average					69.2	67.7	-1.5	---	---
Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)					4	4	0	---	---
Noise Study Area 10W (Segment Number 3 - Pembroke Road to Hollywood Boulevard) See Figure 3.2 Sheets 4 and 6									
Orangebrook Golf & Country Club - West of I-95 between Pembroke Road and Hollywood Boulevard (NSA 10W)	OGC-Tee 5(NE)	Golf Course (South)	1 (Special Land Use)	Recreational NAC C - 66 dB(A)	62.5	62.2	-0.3	Below / No	CNE 6-W (North and South)
	OGC-Tee 5(SW)	Golf Course (South)	1 (Special Land Use)		62.8	62.8	0.0	Below / No	
	OGC-Green 5(W)	Golf Course (South)	1 (Special Land Use)		62.9	61.6	-1.3	Below / No	
	OGC-Green 5(E)	Golf Course (South)	1 (Special Land Use)		63.8	62.2	-1.6	Below / No	
	OGC-Tee 6(S)	Golf Course (South)	1 (Special Land Use)		62.2	60.5	-1.7	Below / No	
	OGC-Green 6(E)	Golf Course (North)	1 (Special Land Use)		70.2	59.0	-11.2	Below / No	
	OGC-Green 6(W)	Golf Course (North)	1 (Special Land Use)		69.1	58.9	-10.2	Below / No	
	OGC-Tee 6(N)	Golf Course (South)	1 (Special Land Use)		63.3	60.3	-3.0	Below / No	
	OGC-Tee 7(S)	Golf Course (North)	1 (Special Land Use)		72.4	58.3	-14.1	Below / No	
	OGC-Green 7(E)	Golf Course (North)	1 (Special Land Use)		66.6	67.5	0.9	Exceeds / Yes	
	OGC-Tee 7 (N)	Golf Course (North)	1 (Special Land Use)		66.6	60.0	-6.6	Below / No	
	OGC-Green 7(W)	Golf Course (North)	1 (Special Land Use)		66.2	67.1	0.9	Exceeds / Yes	
	OGC-Tee 8(E)	Golf Course (North)	1 (Special Land Use)		66.7	67.1	0.4	Exceeds / Yes	
	OGC-Tee 8(W)	Golf Course (North)	1 (Special Land Use)		66.2	66.4	0.2	Approaches / Yes	
	OGC-Green 8(E)	Golf Course (North)	1 (Special Land Use)		63.7	64.7	1.0	Below / No	
	OGC-Green 8(W)	Golf Course (North)	1 (Special Land Use)		63.9	64.5	0.6	Below / No	
	OGC-Tee 10(S)	Golf Course (South)	1 (Special Land Use)		64.4	64.5	0.1	Below / No	
	OGC-Tee 10(N)	Golf Course (South)	1 (Special Land Use)		63.4	63.1	-0.3	Below / No	
	OGC-Green 10(E)	Golf Course (South)	1 (Special Land Use)		66.0	66.3	0.3	Approaches / Yes	
OGC-Green 10(W)	Golf Course (South)	1 (Special Land Use)	65.4	65.7	0.3	Below / No			
OGC-Tee 11(E)	Golf Course (South)	1 (Special Land Use)	67.0	66.8	-0.2	Approaches / Yes			
OGC-Tee 11(W)	Golf Course (South)	1 (Special Land Use)	64.3	63.8	-0.5	Below / No			
Minimum					62.2	58.3	-3.9	---	---
Maximum					72.4	67.5	-4.9	---	---
Average					65.4	63.3	-2.1	---	---
Total Number of Non-Residential / Special Land Use Receptor Sites Equal to or Greater than the Noise Abatement Criteria (NAC)					10	6	-4	---	---
Noise Study Area 11W (Segment Number 3 - Pembroke Road to Hollywood Boulevard) See Figure 3.2 Sheet 6									
Hollywood Jaycee Hall - West of I-95 and South of Hollywood Boulevard (NSA 11W)	HJ-1I	Meeting Hall - Interior Use	1 (Special Land Use)	Institutional Interior NAC D - 51 dB(A)	42.1	42.3	0.2	Below / No	---
	HJ-2C	Park Benches (2)	1 (Special Land Use)	Recreational NAC C - 66 dB(A)	66.5	66.8	0.3	Approaches / Yes	CNE 7-W
Noise Study Area 12W (Segment Number 3 - Pembroke Road to Hollywood Boulevard) See Figure 3.2 Sheet 6									
Central Golf Section of Hollywood Subdivision West of I-95 and South of Hollywood Boulevard (NSA 12W)	CG-F1	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	64.2	64.9	0.7	Below / No	---
	CG-F1.2	First Row Single Family Residence	2		63.4	63.8	0.4	Below / No	---
	CG-F1.3	First Row Single Family Residence	2		63.9	63.9	0.0	Below / No	---
	CG-S1	Second Row Single Family Residence	1		63.0	62.7	-0.3	Below / No	---
	CG-F2	First Row Single Family Residence	1		69.0	68.2	-0.8	Exceeds / Yes	Not Feasible - An Effective Noise Barrier Would Block the Driveway Used to Access the Property
	CG-F3	First Row Single Family Residence	1		67.9	66.9	-1.0	Approaches / Yes	---
Minimum					63.0	62.7	-0.3	---	---
Maximum					69.0	68.2	-0.8	---	---
Average					65.2	65.1	-0.2	---	---
Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)					2	2	0	---	---
Noise Study Area 13E (Segment Number 3 - Pembroke Road to Hollywood Boulevard) See Figure 3.2 Sheet 5									
McNichol Middle School - East of I-95 and North of Pembroke Road (NSA 13E)	MS-1I	School - Interior Use	1 (Special Land Use)	Institutional Interior NAC D - 51 dB(A)	43.4	41.8	-1.6	Below / No	---
	MS-2C	Outdoor Use Area (Four Picnic Tables)	1 (Special Land Use)	Recreational NAC C - 66 dB(A)	63.6	62.3	-1.3	Below / No	---

Table 3.3 - Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 5 of 7)

Name of Noise Sensitive Area/Site	Representative Noise Receptor Site Designation	Noise Sensitive Site Description	Number of Noise Sensitive Sites Represented	Noise Abatement Activity Category - Criteria	TNM Predicted Noise Levels (dBA)		Difference Between Existing Conditions and Build Alternative	Noise Abatement Criteria Status / Consideration of Noise Abatement Warranted? Yes or No	Common Noise Environment (CNE) Identification Number / Comments
					Existing / No Build Conditions	Build Alternative (Design Year 2045)			
Noise Study Area 14E (Segment Number 3 - Pembroke Road to Hollywood Boulevard) See Figure 3.2 Sheet 5									
South Hollywood, Bermack Heights, The Town Colony Condominiums, Jaxon Heights, and Hollywood Little Ranches - East of I-95 between Pembroke Road and Hollywood Boulevard (NSA 14E)	SH-F1	First Row Single Family Residence	5	Residential NAC B - 66 dB(A)	66.0	63.8	-2.2	Below / No	CNE 8-E
	SH-F2	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	63.3	62.5	-0.8	Below / No	
	SH-S2	Second Row Single Family Residence	4	Residential NAC B - 66 dB(A)	67.1	66.0	-1.1	Approaches / Yes	
	SH-T2	Third Row Single Family Residence	1	Residential NAC B - 66 dB(A)	66.1	65.0	-1.1	Below / No	
	SH-F1.1	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	66.2	65.0	-1.2	Below / No	
	SH-F1.2	First Row Single Family Residence	6	Residential NAC B - 66 dB(A)	65.5	64.6	-0.9	Below / No	
	SH-F1.3	First Row Single Family Residence	2	Residential NAC B - 66 dB(A)	64.5	63.7	-0.8	Below / No	
	SH-F3	First Row Single Family Residence	5	Residential NAC B - 66 dB(A)	63.2	62.8	-0.4	Below / No	
	SH-S3	Second Row Single Family Residence	1	Residential NAC B - 66 dB(A)	64.9	64.3	-0.6	Below / No	
	SH-T3	Third Row Single Family Residence	1	Residential NAC B - 66 dB(A)	64.1	64.0	-0.1	Below / No	
	SH-R3	Fourth Row Single Family Residence	1	Residential NAC B - 66 dB(A)	63.2	63.3	0.1	Below / No	
	SH-S3.1	Second Row Single Family Residence	1	Residential NAC B - 66 dB(A)	63.5	62.6	-0.9	Below / No	
	BH-F1	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	62.3	60.6	-1.7	Below / No	
	BH-S1	Second Row Single Family Residence	2	Residential NAC B - 66 dB(A)	65.0	63.2	-1.8	Below / No	
	BH-T1	Third Row Single Family Residence	1	Residential NAC B - 66 dB(A)	63.7	63.2	-0.5	Below / No	
	BH-F2	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	63.7	63.0	-0.7	Below / No	
	BH-S2	Second Row Single Family Residence	3	Residential NAC B - 66 dB(A)	64.8	64.6	-0.2	Below / No	
	BH-F3	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	63.4	67.0	3.6	Exceeds / Yes	
	BH-S3	Second Row Single Family Residence	2	Residential NAC B - 66 dB(A)	64.6	65.0	0.4	Below / No	
	BH-T3	Third Row Single Family Residence	2	Residential NAC B - 66 dB(A)	61.8	61.5	-0.3	Below / No	
	BH-F4	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	62.6	60.4	-2.2	Below / No	
	BH-S4	Second Row Single Family Residence	1	Residential NAC B - 66 dB(A)	64.1	64.4	0.3	Below / No	
	BH-T4	Third Row Single Family Residence	3	Residential NAC B - 66 dB(A)	63.6	63.9	0.3	Below / No	
	TC-P1	Community Pool (The Town Colony Condominiums)	---	Residential NAC B - 66 dB(A)	63.0	70.6	7.6	Exceeds / Yes	
	TC-F1	First Row Single Family Residence	32	Residential NAC B - 66 dB(A)	64.0	69.7	5.7	Exceeds / Yes	
	JH-F1	First Row Single Family Residence	2	Residential NAC B - 66 dB(A)	63.0	74.3	11.3	Exceeds / Yes	
	JH-S1	Second Row Single Family Residence	2	Residential NAC B - 66 dB(A)	61.6	68.7	7.1	Exceeds / Yes	
	JH-T1	Third Row Single Family Residence	2	Residential NAC B - 66 dB(A)	59.9	65.6	5.7	Below / No	
	JH-R1	Fourth Row Single Family Residence	2	Residential NAC B - 66 dB(A)	58.6	63.4	4.8	Below / No	
	JH-F2	First Row Single Family Residence	2	Residential NAC B - 66 dB(A)	64.4	73.0	8.6	Exceeds / Yes	
	JH-S2	Second Row Single Family Residence	2	Residential NAC B - 66 dB(A)	62.9	69.7	6.8	Exceeds / Yes	
	JH-T2	Third Row Single Family Residence	2	Residential NAC B - 66 dB(A)	60.2	66.7	6.5	Approaches / Yes	
	JH-R2	Fourth Row Single Family Residence	2	Residential NAC B - 66 dB(A)	58.9	63.9	5.0	Below / No	
	JH-F3	First Row Single Family Residence	4	Residential NAC B - 66 dB(A)	64.4	71.9	7.5	Exceeds / Yes	
	HL-F1	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	65.0	75.1	10.1	Exceeds / Yes	
	HL-S1	Second Row Single Family Residence	8	Residential NAC B - 66 dB(A)	62.0	68.5	6.5	Exceeds / Yes	
	HL-T1	Third Row Single Family Residence	2	Residential NAC B - 66 dB(A)	60.6	65.9	5.3	Below / No	
	HL-R1	Fourth Row Single Family Residence	3	Residential NAC B - 66 dB(A)	59.5	64.0	4.5	Below / No	
	HL-F2	First Row Single Family Residence	2	Residential NAC B - 66 dB(A)	62.3	72.1	9.8	Exceeds / Yes	
	HL-S2	Second Row Single Family Residence	2	Residential NAC B - 66 dB(A)	61.4	67.5	6.1	Exceeds / Yes	
HL-T2	Third Row Single Family Residence	4	Residential NAC B - 66 dB(A)	60.2	64.5	4.3	Below / No		
HL-T3	Third Row Single Family Residence	1	Residential NAC B - 66 dB(A)	61.5	62.2	0.7	Below / No		
HL-S3	Second Row Single Family Residence	1	Residential NAC B - 66 dB(A)	61.0	62.2	1.2	Below / No		
HL-F3	First Row Single Family Residence	3	Residential NAC B - 66 dB(A)	60.9	61.8	0.9	Below / No		
HL-F4	First Row Single Family Residence	4	Residential NAC B - 66 dB(A)	62.1	62.7	0.6	Below / No		
HL-F5	First Row Single Family Residence	15	Residential NAC B - 66 dB(A)	65.3	69.7	4.4	Exceeds / Yes		
HL-S5	Second Row Single Family Residence	11	Residential NAC B - 66 dB(A)	65.9	66.9	1.0	Approaches / Yes		
HL-T5	Third Row Single Family Residence	1	Residential NAC B - 66 dB(A)	65.8	64.6	-1.2	Below / No		
HL-R5	Fourth Row Single Family Residence	1	Residential NAC B - 66 dB(A)	64.9	63.4	-1.5	Below / No		
Minimum					58.6	60.4	1.8	---	---
Maximum					67.1	75.1	8.0	---	---
Average					63.2	65.6	2.4	---	---
Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)					11	90	79	---	---
Noise Study Area 15E (Segment Number 3 - Pembroke Road to Hollywood Boulevard) See Figure 3.2 Sheet 6									
The Kiddie Kollege of Hollywood - East of I-95 and South of Hollywood Boulevard (NSA 15E)	KK-1C	School Playground	1 (Special Land Use)	Recreational NAC C - 66 dB(A)	61.4	64.8	3.4	Below / No	---
Noise Study Area 16E (Segment Number 3 - Pembroke Road to Hollywood Boulevard) See Figure 3.2 Sheet 6									
St. John's Lutheran Church - East of I-95 and South of Hollywood Boulevard (NSA 16E)	SL-1C	School Playground	1 (Special Land Use)	Recreational NAC C - 66 dB(A)	68.1	69.2	1.1	Exceeds / Yes	CNE 8-E
	SL-2C	School Playground	1 (Special Land Use)		66.5	66.0	-0.5	Approaches / Yes	
	SL-3C	School Playground	1 (Special Land Use)		68.7	68.2	-0.5	Exceeds / Yes	

Table 3.3 - Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 6 of 7)

Name of Noise Sensitive Area/Site	Representative Noise Receptor Site Designation	Noise Sensitive Site Description	Number of Noise Sensitive Sites Represented	Noise Abatement Activity Category - Criteria	TNM Predicted Noise Levels (dBA)		Difference Between Existing Conditions and Build Alternative	Noise Abatement Criteria Status / Consideration of Noise Abatement Warranted? Yes or No	Common Noise Environment (CNE) Identification Number / Comments
					Existing / No Build Conditions	Build Alternative (Design Year 2045)			
Noise Study Area 17E (Segment Number 3 - Pembroke Road to Hollywood Boulevard) See Figure 3.2 Sheet 6									
Stratford's Bar and Grill (Outdoor Seating) - East of I-95 and South of Hollywood Boulevard (NSA 17E)	SB-1E	Restaurant Exterior Use	1 (Special Land Use)	Sensitive Commercial NAC E - 71 dB(A)	68.2	63.4	-4.8	Below / No	---
Noise Study Area 18W (Segment Number 4 - North of Hollywood Boulevard) - See Figure 3.2 Sheet 7									
Lions Park - West of I-95 and North of Hollywood Boulevard (NSA 18W)	LP-1C	Passive Recreational / Trail	1 (Special Land Use)	Recreational NAC C - 66 dB(A)	66.2	64.9	-1.3	Below / No	Not Feasible - An Effective Noise Barrier Would Block the Driveway Used to Access the Property
	LP-2C	Passive Recreational / Trail	1 (Special Land Use)		71.6	68.9	-2.7	Exceeds / Yes	
	LP-3C	Passive Recreational / Trail	1 (Special Land Use)		67.2	65.4	-1.8	Below / No	
Stan Goldman Park and Hollywood Dog Park - West of I-95 and North of Hollywood Boulevard (NSA 18W)	SP-1C	Passive Recreational / Trail	1 (Special Land Use)		69.9	67.9	-2.0	Exceeds / Yes	CNE 9-W
	SP-2C	Passive Recreational / Trail	1 (Special Land Use)		66.1	65.0	-1.1	Below / No	
	SP-3C	Passive Recreational	1 (Special Land Use)		63.7	63.7	0.0	Below / No	
	SP-4C	Passive Recreational / Trail	1 (Special Land Use)		64.7	64.1	-0.6	Below / No	
	SP-5C	Passive Recreational	1 (Special Land Use)		67.0	66.5	-0.5	Approaches / Yes	
	SP-6C	Passive Recreational / Trail	1 (Special Land Use)		65.5	64.8	-0.7	Below / No	
	SP-7C	Passive Recreational	1 (Special Land Use)		68.4	67.8	-0.6	Exceeds / Yes	
	SP-8C	Passive Recreational / Trail	1 (Special Land Use)		66.8	65.9	-0.9	Below / No	
	SP-9C	Passive Recreational / Trail	1 (Special Land Use)		69.4	68.3	-1.1	Exceeds / Yes	
	SP-10C	Passive Recreational / Trail	1 (Special Land Use)		67.1	66.1	-1.0	Approaches / Yes	
	SP-11C	Passive Recreational / Trail	1 (Special Land Use)		70.2	68.4	-1.8	Exceeds / Yes	
	SP-12C	Passive Recreational / Trail	1 (Special Land Use)		66.9	65.9	-1.0	Below / No	
	SP-13C	Passive Recreational / Dog Park	1 (Special Land Use)		70.4	69.9	-0.5	Exceeds / Yes	
	SP-14C	Passive Recreational / Dog Park	1 (Special Land Use)		67.7	67.2	-0.5	Exceeds / Yes	
	SP-15C	Passive Recreational / Dog Park	1 (Special Land Use)		65.8	65.7	-0.1	Below / No	
SP-17C	Skatepark	1 (Special Land Use)	59.1	61.9	2.8	Below / No			
SP-18C	Tennis Courts	1 (Special Land Use)	62.8	63.7	0.9	Below / No			
Minimum					59.1	61.9	2.8	---	---
Maximum					71.6	69.9	-1.7	---	---
Average					66.8	66.1	-0.7	---	---
Total Number of Non-Residential / Special Land Use Receptor Sites Equal to or Greater than the Noise Abatement Criteria (NAC)					14	9	5	---	---
Noise Study Area 19W (Segment Number 4 - North of Hollywood Boulevard) See Figure 3.1 Sheet 7									
Orangebrook Golf Estates and Lakeview Heights - West of I-95 and North of Hollywood Boulevard (NSA 19W)	OGE-F1	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	67.9	65.6	-2.3	Below / No	---
	OGE-F2	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	65.3	64.1	-1.2	Below / No	---
	OGE-F3	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	63.9	63.1	-0.8	Below / No	---
	OGE-F4	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	63.9	63.3	-0.6	Below / No	---
	LH-1F	First Row Single Family Residence	1	Residential NAC B - 66 dB(A)	61.7	62.0	0.3	Below / No	---
	LH-2F	Second Row Single Family Residence	1	Residential NAC B - 66 dB(A)	61.3	61.6	0.3	Below / No	---
Minimum					61.3	61.6	0.3	---	---
Maximum					67.9	65.6	-2.3	---	---
Average					64.0	63.3	-0.7	---	---
Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)					1	0	-1	---	---
Noise Study Area 20W (Segment Number 4 - North of Hollywood Boulevard) See Figure 3.2 Sheet 7									
Knights of Columbus - West of I-95 and South of Johnston Street (NSA 20W)	KC-1I	Meeting Hall - Interior Use	1 (Special Land Use)	Institutional Interior NAC D - 51 dB(A)	36.5	38.7	2.2	Below / No	---
Noise Study Area 21E (Segment Number 4 - North of Hollywood Boulevard) See Figure 3.2 Sheet 7									
Cliff's Restaurant, Orangebrook Village, Broward Shrine Club, and Sha'arel Bina School - East of I-95 and North of Hollywood Boulevard (NSA 21E)	CR-1E	Restaurant - Outdoor Seating	1 (Special Land Use)	Sensitive Commercial NAC E - 71 dB(A)	72.7	68.5	-4.2	Below / No	---
	OV-F1	First Row Multi-Family Residential	8	Residential NAC B - 66 dB(A)	63.9	63.1	-0.8	Below / No	---
	OV-S1	Second Row Multi-Family Residential	8		62.5	61.4	-1.1	Below / No	---
	BSC-1C	Meeting Hall - Outdoor Use Area	1 (Special Land Use)	Recreational NAC C - 66 dB(A)	63.1	62.5	-0.6	Below / No	---
	BSC-2C	Meeting Hall - Outdoor Use Area	1 (Special Land Use)		58.8	58.6	-0.2	Below / No	---
	SBS-1I	Basketball Court and Volley Ball Court	1 (Special Land Use)		61.2	60.5	-0.7	Below / No	---
Noise Study Area 22E (Segment Number 4 - North of Hollywood Boulevard) See Figure 3.2 Sheet 7									
Hollywood Little Ranches - North of Hollywood Boulevard (NSA 22E)	HLR-F1	First Row Multi-Family Residential	5	Residential NAC B - 66 dB(A)	55.0	55.3	0.3	Below / No	CNE 10-E
	HLR-F2	First Row Multi-Family Residential	2		62.4	75.6	13.2	Exceeds / Yes	
	HLR-S2	Second Row Multi-Family Residential	2		61.1	73.2	12.1	Exceeds / Yes	
	HLR-T2	Third Row Multi-Family Residential	2		60.3	71.3	11.0	Exceeds / Yes	
	HLR-R2	Fourth Row Multi-Family Residential	2		60.8	70.1	9.3	Exceeds / Yes	
	HLR-F3	First Row Multi-Family Residential	10		62.7	72.2	9.5	Exceeds / Yes	
	HLR-F4	First Row Single Family Residence	1		62.0	70.9	8.9	Exceeds / Yes	
	HLR-S4	Second Row Single Family Residence	1		59.2	67.8	8.6	Exceeds / Yes	
	HLR-T4	Third Row Single Family Residence	1		58.0	66.1	8.1	Approaches / Yes	
	HLR-R4	Fourth Row Single Family Residence	1		57.4	65.8	8.4	Below / No	
	HLR-F5	First Row Single Family Residence	1		62.1	68.1	6.0	Exceeds / Yes	
	HLR-S5	Second Row Single Family Residence	1		61.2	66.7	5.5	Approaches / Yes	

Table 3.3 - Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 7 of 7)

Name of Noise Sensitive Area/Site	Representative Noise Receptor Site Designation	Noise Sensitive Site Description	Number of Noise Sensitive Sites Represented	Noise Abatement Activity Category - Criteria	TNM Predicted Noise Levels (dBA)		Difference Between Existing Conditions and Build Alternative	Noise Abatement Criteria Status / Consideration of Noise Abatement Warranted? Yes or No	Common Noise Environment (CNE) Identification Number / Comments
					Existing / No Build Conditions	Build Alternative (Design Year 2045)			
Hollywood Little Ranches - North of Hollywood Boulevard (NSA 22E) Continued	HLR-T5	Third Row Single Family Residence	1	Residential NAC B - 66 dB(A)	60.9	66.1	5.2	Approaches / Yes	CNE 10-E (Continued)
	HLR-F6	Fourth Row Single Family Residence	1		62.6	67.9	5.3	Exceeds / Yes	
	HLR-S6	Second Row Single Family Residence	1		60.3	63.6	3.3	Below / No	
	HLR-F7	First Row Single Family Residence	1		63.3	67.8	4.5	Exceeds / Yes	
	HLR-F8	First Row Single Family Residence	1		66.4	67.3	0.9	Exceeds / Yes	
	HLR-S8	Second Row Single Family Residence	1		64.5	64.7	0.2	Below / No	
Minimum					55.0	55.3	0.3	---	---
Maximum					66.4	75.6	9.2	---	---
Average					61.1	67.8	6.7	---	---
Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)					1	27	26	---	---

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APPENDIX E
Noise Barrier Analyses Tables
(4.1.1.1 – 4.4.2.1)

Table 4.1.1.1 - Noise Barrier Analyses for Common Noise Environment CNE 1-W (Ives Estates Park / NSA 3-W)

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	Noise Barrie Type (Location)	Height (Feet)	Length (feet)	Begin Station	End Station										
Ives Estates Park (Outdoor Use/Sports Area - Regional Park) / Common Noise Environment CNE 1-W (West of I-95 between Ives Dairy Road and Miami-Dade / Broward County Line - Noise Study Area NSA 1W) See Figure 3-2 Sheet 1															
CD 1W-1	Ground Mounted (Western SFRC Right-of-Way Line)	16	2,740	179+20	206+60	\$1,315,200	8.0	5.7	75%	YES	NO	1,849	NO	NO	NO
CD 1W-2	Ground Mounted (I-95 Eastern Right-of-Way Line)	18	2,740	179+20	206+60	\$1,479,600	8.8	6.5	85%	YES	NO	2,080	NO	NO	NO
CD 1W-3	Ground Mounted (I-95 Eastern Right-of-Way Line)	20	2,740	179+20	206+60	\$1,644,000	9.5	7.2	90%	YES	NO	2,311	NO	NO	NO
CD 1W-4	Ground Mounted (I-95 Eastern Right-of-Way Line)	22	2,740	179+20	206+60	\$1,808,400	10.3	7.8	100%	YES	YES	2,542	NO	NO	NO

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Table 4.1.1.2 - Conceptual Noise Barrier Design - Usage Analysis for Ives Estates Park/NSA 1W (CNE 1-W)

Item	Criteria	Actual Usage	Minimum Usage Required to Meet FDOT's Cost Reasonableness Criteria (Input Data)				Units
			Conceptual Noise Barrier Design Number				
			CD 1W-1	CD 1W-2	CD 1W-3	CD 1W-4	
1	Enter Length of Proposed Noise Barrier	---	2,740	2,740	2,740	2,740	feet
2	Enter Height of Proposed Noise Barrier	---	16	18	20	22	feet
3	Total Square Feet of Proposed Noise Barrier (Multiply item 1 by Item 2)	---	43,840	49,320	54,800	60,280	feet ²
4	Enter the average amount of time that a person stays at the site per visit	Unavailable	---	---	---	---	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	Unavailable	---	---	---	---	persons
6	Total Person Hours per Day Benefited by Noise Barrier (Multiply Item 4 by Item 5 - N/A) - Minimum Usage Required to Meet FDOT's Cost Reasonableness Criteria (Divide Item 3 by 7)	---	1,849	2,080	2,311	2,542	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 ² /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 ²
9	Does item 8 exceed the "abatement cost factor" of: \$995,935/person-hour/ft ² ?	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)

Table 4.1.2.1 - Noise Barrier Analyses for Common Noise Environment CNE 2-W (Green Acres Village and Holiday Mobile Estates/NSA 3W)

Noise Sensitive Area Name / Number	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	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)	Maximum Noise Reduction for all Benefited Receptor Sites dB(A)	Cost (\$30 per square foot)	Average Cost/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 and Feasible?	Comments
Green Acres Village and Holiday Mobile Estates - South of Hallandale Beach Boulevard and West of I-95 / NSA 3W	CD 2W-1	Ground Mounted	Back of Sidewalk: South of Eastbound Hallandale Beach Boulevard Lanes	8	590	132+00	137+90	3	3	9	12	6.8	7.5	\$182,400	\$15,200	NO (Not Feasible - Insufficient Right-of-way to Constructed Noise Barrier)	---
				8	170	138+30	140+00										
	CD 2W-2	Ground Mounted	Back of Sidewalk: South of Eastbound Hallandale Beach Boulevard Lanes	10	590	132+00	137+90	3	3	17	20	6.8	8.8	\$228,000	\$11,400	NO (Not Feasible - Insufficient Right-of-way to Constructed Noise Barrier)	Represents the optimal conceptual noise barrier design; Not considered a feasible abatement measure due to insufficient existing right-of-way to accommodate a noise barrier at this location; Noise barriers are recommended to be further evaluated at this location during the project's design phase when additional design information including topographical survey would be available.
				10	170	138+30	140+00										
	CD 2W-3	Ground Mounted	Back of Sidewalk: South of Eastbound Hallandale Beach Boulevard Lanes	12	590	132+00	137+90	3	3	17	20	7.3	9.5	\$273,600	\$13,680	NO (Not Feasible - Insufficient Right-of-way to Constructed Noise Barrier)	
				12	170	138+30	140+00										
	CD 2W-3	Ground Mounted	Back of Sidewalk: South of Eastbound Hallandale Beach Boulevard Lanes	14	590	132+00	137+90	3	3	18	21	7.6	10.0	\$319,200	\$15,200	NO (Not Feasible - Insufficient Right-of-way to Constructed Noise Barrier)	
				14	170	138+30	140+00										

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 Represents the optimal conceptual noise barrier design and is recommended for further consideration and public input in the project's design phase.

Table 4.1.3.1 - Noise Barrier Analyses for Common Noise Environment CNE 3-E (Highland Gardens and Parkside Manor Communities/NSA 4E)

Noise Sensitive Area Name / Number	Conceptual Noise Barrier Design Number	Noise Barrier Type (Segment Name)	Noise Barrier Location	Height (feet)	Length (feet)	Begin Station Number	End Station Number	Number of Impacted Receptor Sites	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)	Maximum Noise Reduction for all Benefited Receptor Sites dB(A)	Cost (\$30 per square foot)	Average Cost/ 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?	Comments	
Highland Gardens (South Segment - Replacement Noise Barrier)																		
Highland Gardens and Parkside Manor Communities - East of I-95 and between Ives Dairy Road and Hallandale Beach Boulevard / NSA 4E	CD 3E-1S	South Segment - Replacement Ground Mounted Noise Barrier	I-95 West Right-of-way Line (Miami-Dade/Broward County Line)	16	200	204+80	206+80	11	2	0	2	9.6	12.3	\$96,000	\$48,000	No (Not Applicable - Replacement Noise Barrier)	Represents an in-kind replacement noise barrier and is recommended for further consideration and public input in the project's design phase; Segments of the existing noise barrier are physically impacted by the widening of I-95 and require replacement.	
	Parkside Manor (North Segment - Replacement Noise Barrier/System)																	
	CD 3E-1N	North Segment -Shoulder Mounted	Outside Shoulder: I-95 Northbound Off Ramp to Hallandale Beach Boulevard	8	1,080	231+00	241+80	47	12	0	12	7.6	9.0	\$259,200	\$21,600	YES (Replacement Noise Barrier)	---	
	CD 3E-2N	North Segment -Shoulder Mounted	Outside Shoulder: I-95 Northbound Off Ramp to Hallandale Beach Boulevard	8	1,080	231+00	241+80	47	34	1	35	7.1	10.5	\$343,200	\$9,806	YES (Replacement Noise Barrier System)	---	
			Outside Shoulder: I-95 Northbound CD Road On Ramp South of Hallandale Beach Boulevard (Supplemental)	8	350	368+50	372+00											
	CD 3E-3N	North Segment -Shoulder Mounted	Outside Shoulder: I-95 Northbound Off Ramp to Hallandale Beach Boulevard	14	1,080	231+00	241+80	47	39	0	39	7.3	11.9	\$453,600	\$11,631	YES (Replacement Noise Barrier)	---	
	CD 3E-4N	North Segment -Shoulder Mounted	Outside Shoulder: I-95 Northbound Off Ramp to Hallandale Beach Boulevard (Supplemental)	8	600	236+00	242+00	47	43	11	54	8.1	12.1	\$597,600	\$11,067	YES (Replacement Noise Barrier System)	Represents the optimal conceptual replacement noise barrier design and is recommended for further consideration and public input in the project's design phase; Segments of the existing noise barrier are physically impacted by the widening of I-95 and require replacement.	
Outside Shoulder: I-95 Northbound CD Road On Ramp South of Hallandale Beach Boulevard			14	1,080	231+00	241+80												

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Represents the optimal conceptual noise barrier design and is recommended for further consideration and public input in the Final Design phase.

Table 4.2.1.1 - Noise Barrier Analyses for Common Noise Environment CNE 4-E (Meekins Addition No.1 Subdivision/NSA 8E)

Noise Sensitive Area Name / Number	Conceptual Noise Barrier Design Number	Noise Barrier Type (Segment Name)	Noise Barrier Location	Height (feet)	Length (feet)	Begin Station Number	End Station Number	Number of Impacted Receptor Sites	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)	Maximum Noise Reduction for all Benefited Receptor Sites dB(A)	Cost (\$30 per square foot)	Average Cost/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?	Comments
Meekins Addition No.1 Subdivision - East of I-95 and South of Pembroke Road / NSA 8E	CD 4E-1	Ground Mounted	I-95 Eastern Right-of-way Line South of Pembroke Road	18	610	281+00	287+00	2	0	0	0	2.6	3.7	\$329,400	---	NO	---
	CD 4E-2	Ground Mounted	I-95 Eastern Right-of-way Line South of Pembroke Road	20	610	281+00	287+00	2	0	0	0	2.8	4.0	\$366,000	---	NO	---
	CD 4E-3	Ground Mounted	I-95 Eastern Right-of-way Line South of Pembroke Road	22	610	281+00	287+00	2	0	0	0	2.9	4.1	\$402,600	---	NO	---
	CD 4E-4	Shoulder Mounted	Outside Shoulder: I-95 Northbound Off Ramp to Pembroke Road	8	700	274+00	281+00	2	0	0	0	3.8	3.8	\$636,000	---	NO	---
				14	600	281+00	287+00										
	CD 4E-5	Shoulder Mounted	Outside Shoulder: I-95 Northbound CD Road South of Pembroke Road	8	900	278+00	287+00	2	2	0	2	5.2	6.2	\$786,600	\$393,300	NO	Represents the optimal conceptual noise barrier design; Not recommended for further consideration or public input during the project's design phase since the Cost Reasonable Criteria and the minimum noise reduction design goal of 7 dB(A) are not met.
				8	700	274+00	281+00										
				22	610	281+00	287+00										
	CD 4E-5	Shoulder Mounted	Outside Shoulder: I-95 Northbound CD Road On Ramp South of Hallandale Beach Boulevard	8	900	278+00	287+00	2	2	0	2	5.2	6.2	\$786,600	\$393,300	NO	Represents the optimal conceptual noise barrier design; Not recommended for further consideration or public input during the project's design phase since the Cost Reasonable Criteria and the minimum noise reduction design goal of 7 dB(A) are not met.
22				610	281+00	287+00											

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Table 4.2.2-1: Noise Barrier Analyses for Common Noise Environment CNE 5-E (Choice Children's Academy/NSA 9E)

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	Noise Barrie Type (Location)	Height (Feet)	Length (feet)	Begin Station	End Station										
Choice Children's Academy (Playground) / Common Noise Environment CNE 5-E (East of I-95 between Hallandale Beach Boulevard and Pembroke Road - Noise Study Area NSA 9E) See Figure 3-2 Sheet 5															
CD 5E-1	Ground Mounted (Right-of-Way Line)	16	560	283+00	287+60	\$832,800	7.0	5.9	75%	YES	NO	1,171	NO	NO	NO
	Shoulder Mounted (Off Ramp)	14	600	281+00	287+00										
	Shoulder Mounted (Off Ramp)	8	600	275+00	281+00										
	Shoulder Mounted (I-95 NB)	8	700	280+00	287+00										
CD 5E-2	Ground Mounted (Right-of-Way Line)	18	560	283+00	287+60	\$866,400	7.4	6.1	75%	YES	NO	1,218	NO	NO	NO
	Shoulder Mounted (Off Ramp)	14	600	281+00	287+00										
	Shoulder Mounted (Off Ramp)	8	600	275+00	281+00										
	Shoulder Mounted (I-95 NB)	8	700	280+00	287+00										
CD 5E-3	Ground Mounted (I-95 Eastern Right-of-Way Line)	20	560	283+00	287+60	\$900,000	7.8	6.4	75%	YES	NO	1,265	NO	NO	NO
	Shoulder Mounted (Off Ramp)	14	600	281+00	287+00										
	Shoulder Mounted (Off Ramp)	8	600	275+00	281+00										
	Shoulder Mounted (I-95 NB)	8	700	280+00	287+00										
CD 5E-4	Ground Mounted (I-95 Eastern Right-of-Way Line)	22	560	283+00	287+60	\$933,600	8.2	6.7	75%	YES	NO	1,312	NO	NO	NO
	Shoulder Mounted (Off Ramp)	14	600	281+00	287+00										
	Shoulder Mounted (Off Ramp)	8	600	275+00	281+00										
	Shoulder Mounted (I-95 NB)	8	700	280+00	287+00										

Table 4.2.2.2 - Conceptual Noise Barrier Design - Usage Analysis for Choice Childrens Academy/NSA 9E (CNE 5-E)

Item	Criteria	Actual Usage	Minimum Usage Required to Meet FDOT's Cost Reasonableness Criteria (Input Data)				Units
			Conceptual Noise Barrier Design Number				
			CD 5E-1	CD 5E-2	CD 5E-3	CD 5E-4	
1	Enter Length of Proposed Noise Barrier Segments	---	700/600/600/560	700/600/600/560	700/600/600/560	700/600/600/560	feet
2	Enter Height of Proposed Noise Barrier Segments	---	8/8/14/16	8/8/14/18	8/8/14/20	8/8/14/20	feet
3	Total Square Feet of Proposed Noise Barrier System (Multiply item 1 by Item 2)	---	27,760	28,880	30,000	31,120	feet ²
4	Enter the average amount of time that a person stays at the site per visit	Unavailable	---	---	---	---	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	Unavailable	---	---	---	---	persons
6	Total Person Hours per Day Benefited by Noise Barrier System (Multiply Item 4 by Item 5 - N/A) - Minimum Usage Required to Meet FDOT's Cost Reasonableness Criteria (Divide Item 3 by 7)	---	1,171	1,218	1,265	1,312	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 ² /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 ²
9	Does item 8 exceed the "abatement cost factor" of: \$995,935/person-hour/ft ² ?	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)

Table 4.3.1.1 - Noise Barrier Analyses for Common Noise Environment CNE 6-W (Orangebrook Golf & Country Club/NSA 10W)

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	Noise Barrie Type (Location)	Height (Feet)	Length (feet)	Begin Station	End Station										
Orangebrook Golf & County Club (Golf Course - North of Pembroke Road) / Common Noise Environment CNE 6-W (Noise Study Area NSA 10W) See Figure 3-2 Sheets 4 and 6															
CD 6W-1S	Ground Mounted (Western SFRC Right-of-Way Line)	16	480	289+00	293+80	\$230,400	5.9	5.9	50%	YES	NO	324	NO	NO	NO
CD 6W-2S	Ground Mounted (I-95 Eastern Right-of-Way Line)	18	480	289+00	293+80	\$259,200	6.5	6.0	100%	YES	YES	364	NO	NO	NO
CD 6W-3S	Ground Mounted (I-95 Eastern Right-of-Way Line)	20	340	289+20	292+60	\$204,000	7.0	5.9	100%	YES	YES	287	NO	NO	NO
CD 6W-4S	Ground Mounted (I-95 Eastern Right-of-Way Line)	22	260	289+40	292+00	\$171,600	7.1	6.2	100%	YES	YES	241	NO	NO	NO
Orangebrook Golf & County Club (Golf Course - South of Hollywood Boulevard) / Common Noise Environment CNE 6-W (Noise Study Area NSA 10W) See Figure 3-2 Sheets 4 and 6															
CD 6W-1N	Ground Mounted (Western SFRC Right-of-Way Line)	16	460	334+00	338+60	\$220,800	7.7	6.7	100%	YES	YES	310	NO	NO	NO
CD 6W-2N	Ground Mounted (I-95 Eastern Right-of-Way Line)	18	460	334+00	338+60	\$248,400	8.2	7.3	100%	YES	YES	349	NO	NO	NO
CD 6W-3N	Ground Mounted (I-95 Eastern Right-of-Way Line)	20	460	334+00	338+60	\$276,000	8.7	7.8	100%	YES	YES	388	NO	NO	NO
CD 6W-4N	Ground Mounted (I-95 Eastern Right-of-Way Line)	22	460	334+00	338+60	\$303,600	9.1	8.2	100%	YES	YES	427	NO	NO	NO

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Table 4.3.1.2 - Conceptual Noise Barrier Design - Usage Analysis for Orangebrook Golf and Country Club/NSA 10W (CNE 6-W South)

Item	Criteria	Actual Usage	Minimum Usage Required to Meet FDOT's Cost Reasonableness Criteria (Input Data)				Units
			Conceptual Noise Barrier Design Number				
			CD 6W-1S	CD 6W-2S	CD 6W-3S	CD 6W-4S	
1	Enter Length of Proposed Noise Barrier	---	480	480	340	260	feet
2	Enter Height of Proposed Noise Barrier	---	16	18	20	22	feet
3	Total Square Feet of Proposed Noise Barrier (Multiply item 1 by Item 2)	---	7,680	8,640	6,800	5,720	feet ²
4	Enter the average amount of time that a person stays at the site per visit	Unavailable	---	---	---	---	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	Unavailable	---	---	---	---	persons
6	Total Person Hours per Day Benefited by Noise Barrier (Multiply Item 4 by Item 5 - N/A) - Minimum Usage Required to Meet FDOT's Cost Reasonableness Criteria (Divide Item 3 by 7)	---	324	364	287	241	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 ² /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 ²
9	Does item 8 exceed the "abatement cost factor" of: \$995,935/person-hour/ft ² ?	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)

Table 4.3.1.3 - Conceptual Noise Barrier Design - Usage Analysis for Orangebrook Golf and Country Club/NSA 10W (CNE 6-W North)

Item	Criteria	Actual Usage	Minimum Usage Required to Meet FDOT's Cost Reasonableness Criteria (Input Data)				Units
			Conceptual Noise Barrier Design Number				
			CD 6W-1N	CD 6W-2N	CD 6W-3N	CD 6W-4N	
1	Enter Length of Proposed Noise Barrier	---	460	460	460	460	feet
2	Enter Height of Proposed Noise Barrier	---	16	18	20	22	feet
3	Total Square Feet of Proposed Noise Barrier (Multiply item 1 by Item 2)	---	7,360	8,280	9,200	10,120	feet ²
4	Enter the average amount of time that a person stays at the site per visit	Unavailable	---	---	---	---	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	Unavailable	---	---	---	---	persons
6	Total Person Hours per Day Benefited by Noise Barrier (Multiply Item 4 by Item 5 - N/A) - Minimum Usage Required to Meet FDOT's Cost Reasonableness Criteria (Divide Item 3 by 7)	---	310	349	388	427	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 ² /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 ²
9	Does item 8 exceed the "abatement cost factor" of: \$995,935/person-hour/ft ² ?	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)

Table 4.3.2-1: Noise Barrier Analyses for Common Noise Environment CNE 7-W (Hollywood Jaycee Hall/NSA 11W)

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	Noise Barrie Type (Location)	Height (Feet)	Length (feet)	Begin Station	End Station										
Hollywood Jaycee Hall (Outdoor Seating) / Common Noise Environment CNE 7-W (West of I-95 and South of Hollywood Boulevard - Noise Study Area NSA 11W) See Figure 3-2 Sheet 6															
CD 7W-1	Ground Mounted (I-95 Western Right-of-Way Line)	20	280	337+80	340+60	\$168,000	6.7	6.7	0%	NO	NO	236	NO	NO	NO
CD 7W-2	Ground Mounted (I-95 Western Right-of-Way Line)	22	280	337+80	340+60	\$184,800	7.2	7.2	100%	YES	YES	260	NO	NO	NO

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Table 4.3.2.2 - Conceptual Noise Barrier Design - Usage Analysis for Hollywood Jaycee Hall - Outdoor Use Area/NSA 11W (CNE 7-W)

Item	Criteria	Actual Usage	Minimum Usage Required to Meet FDOT's Cost Reasonableness Criteria (Input Data)		Units
			Conceptual Noise Barrier Design Number		
			JH-CD3	JH-CD4	
1	Enter Length of Proposed Noise Barrier	---	280	280	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)	---	5,600	6,160	feet ²
4	Enter the average amount of time that a person stays at the site per visit	Unavailable	---	---	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	Unavailable	---	---	persons
6	Total Person Hours per Day Benefited by Noise Barrier (Multiply Item 4 by Item 5 - N/A) - Minimum Usage Required to Meet FDOT's Cost Reasonableness Criteria (Divide Item 3 by 7)	---	236	260	person-hours
7	Average Square Foot of Noise Barrier per Person Hour (Divide Item 3 by Item 6)	---	23.71	23.71	feet ² /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 ²
9	Does item 8 exceed the "abatement cost factor" of: \$995,935/person-hour/ft ² ?	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)

Table 4.3.3.1 - Noise Barrier Analyses for Common Noise Environment CNE 8-E (South Hollywood, Bermack Heights, The Town Colony Condominiums, Jaxon Heights, and Hollywood Little Ranches/NSA 14E)

Noise Sensitive Area Name / Number	Conceptual Noise Barrier Design Number	Noise Barrier Type (Segment Name)	Noise Barrier Location	Height (feet)	Length (feet)	Begin Station Number	End Station Number	Number of Impacted Receptor Sites	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)	Maximum Noise Reduction for all Benefited Receptor Sites dB(A)	Cost (\$30 per square foot)	Average Cost/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?	Comments
South Hollywood, Bermack Heights, The Town Colony Condominiums, Jaxon Heights, and Hollywood Little Ranches - East of I-95 between Pembroke Road and Hollywood Boulevard / NSA 14E and St. John's Lutheran Church / NSA 16E	CD 8E-1	Shoulder Mounted (Replacement Barrier System)	Outside Shoulder: I-95 Northbound Lanes and Off Ramp to Hollywood Boulevard	8	4,180	298+30	340+10	90	58	0	58	6.2	7.9	\$1,003,200	\$17,297	YES	---
	CD 8E-2	Shoulder Mounted (Replacement)	Outside Shoulder: I-95 Northbound Lanes and Off Ramp to Hollywood Boulevard (298+30 to 307+00 MSE Wall)	14	2,900	298+30	327+30	90	74	4	78	7.7	11.1	\$1,533,000	\$19,654	YES (Replacement Noise Barrier System)	---
		Ground Mounted (Existing)	I-95 Eastern Right-of-way Line	16 to 18	730	326+50	333+50										
		Shoulder Mounted (Replacement)	Outside Shoulder: I-95 Northbound Off Ramp to Hollywood Boulevard	14	440	333+00	337+40										
		Shoulder Mounted (Supplemental)	Outside Shoulder: I-95 Northbound Off Ramp to Hollywood Boulevard	14	310	337+40	340+50										
	CD 8E-3	Shoulder Mounted (Replacement)	Outside Shoulder: I-95 Northbound Lanes and Off Ramp to Hollywood Boulevard	14	2,900	298+30	327+30	90	74	5	79	7.9	11.1	\$1,772,400	\$22,435	YES (Replacement Noise Barrier System)	Represents the optimal conceptual replacement noise barrier design and is recommended for further consideration and public input in the project's design phase; Segments of the existing noise barrier are physically impacted by the widening of I-95 and require replacement; St. John's Lutheran Church playground would receive incidental benefit from this conceptual noise barrier design.
		Shoulder Mounted (Replacement)	Outside Shoulder: I-95 Northbound Off Ramp to Hollywood Boulevard	14	570	327+30	333+00										
		Shoulder Mounted (Replacement)	Outside Shoulder: I-95 Northbound Off Ramp to Hollywood Boulevard	14	430	333+00	337+40										
		Shoulder Mounted (Supplemental)	Outside Shoulder: I-95 Northbound Off Ramp to Hollywood Boulevard	14	320	337+40	340+50										
	CD 8E-4	Shoulder Mounted (Supplemental)	Outside Shoulder: I-95 Northbound Off Ramp to Hallandale Beach Boulevard	8	1,140	286+90	298+30	90	74	4	78	7.7	11.1	\$1,962,600	\$25,162	YES (Replacement Noise Barrier System)	---
		Shoulder Mounted (Replacement)	Outside Shoulder: I-95 Northbound Lanes and Off Ramp to Hollywood Boulevard	14	2,900	298+30	327+30										
		Ground Mounted (Existing)	I-95 Eastern Right-of-way Line	16 to 18	730	326+50	333+50										
		Shoulder Mounted (Replacement)	Outside Shoulder: I-95 Northbound Off Ramp to Hollywood Boulevard	14	440	333+00	337+40										
		Shoulder Mounted (Supplemental)	Outside Shoulder: I-95 Northbound Off Ramp to Hollywood Boulevard	14	310	337+40	340+50										
		Shoulder Mounted (Supplemental)	Outside Shoulder: I-95 Northbound CD Road On Ramp South of Hallandale Beach Boulevard	8	650	334+50	341+00										

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Represents the optimal conceptual noise barrier design and is recommended for further consideration and public input in the project's design phase.

Table 4.4.1-1: Noise Barrier Analyses for Common Noise Environment CNE 9-W (Stan Goldman Park and Hollywood Dog Park/NSA 18W)

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	Noise Barrie Type (Location)	Height (Feet)	Length (feet)	Begin Station	End Station										
Stan Golman Park (Passive Recreation/Trails) / Common Noise Environmenta CNE 9-W (West of I-95 and North of Hollywood Boulevard - Noise Study Area NSA 18W) See Figure 3-2 Sheet 7															
CD 9W-1	Ground Mounted (Western I-95 Right-of-Way Line / Eastern of SFRC Right-of-way Line)	16	1,600	345+00	361+00	\$768,000	6.1	5.6	60%	YES	YES	1,080	NO	NO	NO
CD 9W-2	Ground Mounted (Western I-95 Right-of-Way Line / Eastern of SFRC Right-of-way Line)	18	1,600	345+00	361+00	\$864,000	6.8	6.4	60%	YES	YES	1,215	NO	NO	NO
CD 9W-3	Ground Mounted (Western I-95 Right-of-Way Line / Eastern of SFRC Right-of-way Line)	20	1,600	345+00	361+00	\$960,000	7.3	6.1	100%	YES	YES	1,349	NO	NO	NO
CD 9W-4	Ground Mounted (Western I-95 Right-of-Way Line / Eastern of SFRC Right-of-way Line)	22	1,500	346+00	361+00	\$990,000	7.8	6.4	100%	YES	YES	1,392	NO	NO	NO

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Table 4.4.1.2 - Conceptual Noise Barrier Design - Usage Analysis for Stan Goldman Park and Hollywood Dog Park/NSA 18W (CNE 9-W)

Item	Criteria	Actual Usage	Minimum Usage Required to Meet FDOT's Cost Reasonableness Criteria (Input Data)				Units
			Conceptual Noise Barrier Design Number				
			CD 9W-1	CD 9W-2	CD 9W-3	CD 9W-4	
1	Enter Length of Proposed Noise Barrier	---	1,600	1,600	1,600	1,500	feet
2	Enter Height of Proposed Noise Barrier	---	16	18	20	22	feet
3	Total Square Feet of Proposed Noise Barrier (Multiply item 1 by Item 2)	---	25,600	28,800	32,000	33,000	feet ²
4	Enter the average amount of time that a person stays at the site per visit	Unavailable	---	---	---	---	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	Unavailable	---	---	---	---	persons
6	Total Person Hours per Day Benefited by Noise Barrier (Multiply Item 4 by Item 5 - N/A) - Minimum Usage Required to Meet FDOT's Cost Reasonableness Criteria (Divide Item 3 by 7)	---	1,080	1,215	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	23.71	23.71	feet ² /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 ²
9	Does item 8 exceed the "abatement cost factor" of: \$995,935/person-hour/ft ² ?	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)

Table 4.4.2.1 - Noise Barrier Analyses for Common Noise Environment CNE 10E (Hollywood Litle Ranches/NSA 22E)

Noise Sensitive Area Name / Number	Conceptual Noise Barrier Design Number	Noise Barrier Type (Segment Name)	Noise Barrier Location	Height (feet)	Length (feet)	Begin Station Number	End Station Number	Number of Impacted Receptor Sites	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)	Maximum Noise Reduction for all Benefited Receptor Sites dB(A)	Cost (\$30 per square foot)	Average Cost/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?	Comments
Hollywood Little Ranches - East of I-95 and North of Hollywood Boulevard / NSAs 22E	CD 10E-1	Shoulder Mounted	Outside Shoulder: I-95 Northbound On Ramp from Hollywood Boulevard to Johnson Street South Bridge Approach; On MSE Wall from Station 358+00 to 368+70	8	1,350	355+20	368+70	27	21	1	22	6.7	9.3	\$324,000	\$14,727	YES (Replacement Noise Barrier)	---
	CD 10E-2	Shoulder Mounted	Outside Shoulder: I-95 Northbound On Ramp from Hollywood Boulevard; On MSE Wall from Station 358+00 to 368+70 and 372+20 to 372+00; On Bridge Station 368+70 to 372+20	8	1,680	355+20	372+00	27	25	1	26	6.3	9.3	\$403,200	\$15,508	YES (Replacement Noise Barrier)	---
	CD 10E-3	Shoulder Mounted	Outside Shoulder: I-95 Northbound On Ramp from Hollywood Boulevard to Johnson Street South Bridge Approach; On MSE Wall from Station 358+00 to 368+70; On Bridge Station 368+70 to 372+20	14	1,350	355+20	368+50	27	25	1	26	8.5	12.9	\$567,000	\$21,808	YES (Replacement Noise Barrier)	---
	CD 10E-4	Shoulder Mounted	Outside Shoulder: I-95 Northbound On Ramp from Hollywood Boulevard; On MSE Wall from Station 358+00 to 368+70 and 372+20 to 372+00; On Bridge Station 368+70 to 372+20	14	1,350	355+20	368+70	27	27	1	28	8.6	12.9	\$646,200	\$23,079	YES (Replacement Noise Barrier)	Represents the optimal conceptual replacement noise barrier design and is recommended for further consideration and public input in the project's design phase; Segments of the existing noise barrier are physically impacted by the widening of I-95 and require replacement; 14-foot tall shoulder mounted noise barrier will require a design variation since it will be on an MSE wall.
			8	330	368+70	372+00											

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 Represents the optimal conceptual noise barrier design and is recommended for further consideration and public input in the Final Design phase.

