

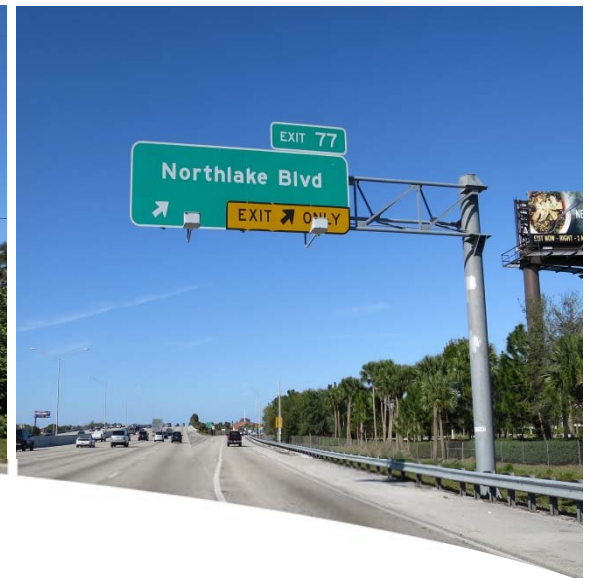
# Project Development & Environment (PD&E) Study For SR 9/I-95 @ Northlake Boulevard Interchange In Palm Beach County



## Draft Noise Study Report

FM No: 435803-1-22-02

ETDM No: 14182



August 2017

Florida Department of Transportation | District IV  
3400 West Commercial Boulevard | Fort Lauderdale, FL 33309

**Draft Noise Study Report**  
**SR 9/I-95**  
**at**  
**Northlake Boulevard Interchange**

Palm Beach County, Florida  
FM No: 435803-1-22-02 | ETDM No: 14182

Prepared for:



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District IV  
3400 West Commercial Blvd.  
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**August 2017**

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

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## Executive Summary

This Noise Study Report (NSR) is for the SR-9/I-95 at Northlake Boulevard Interchange Project Development & Environment (PD&E) Study and provides detailed analysis and results from the evaluation of the preliminary engineering concept of the recommended alternative for the proposed transportation improvements. Factors related to traffic noise and the adjacent noise sensitive receptors in the project area have been evaluated for the Existing Conditions, No-Build option and Alternative 1- Modified Concept. The study area includes I-95 at Northlake Boulevard interchange located in Palm Beach County, Florida. The I-95 proposed interchange improvements are located on Northlake Boulevard within the limits of Keating Drive to Sunrise Drive and on the I-95 mainline approximately 0.5 miles north and south of Northlake Boulevard. The Final Programming Summary Report was published May 2015 (14182).

The study evaluated the No-Build and the recommended Build alternative to determine if future noise levels approach or exceed the Federal Highway Administration (FHWA) Noise Abatement Criteria (NAC) at the noise sensitive sites. The noise analysis was performed according to procedures established in 23 CFR 772 and Part 2, Chapter 17 of the Florida Department of Transportation (FDOT) PD&E Manual (version 7/27/2016). The prediction of future traffic noise levels was accomplished through the FHWA's Traffic Noise Model (TNM, version 2.5). Evaluation of future noise levels utilized forecasted traffic volumes for the 2040 design year. Future noise levels will increase whether or not the proposed improvements are constructed due to the expected increase in future traffic volumes.

For this study a total of 47 noise sensitive receptors were evaluated for traffic noise impacts associated with the proposed improvements. There were a total of 29 impacted Category B, C & E NAC receptors for the proposed Alternative 1 – Modified Concept scenario. Three of these receptors are impacted in all of the scenarios evaluated, the Existing condition, the No Build and the proposed Alternative 1 – Modified Concept (i.e. Build).

1 There are four special use areas (Activity Categories C and E) in the project vicinity. These include  
2 a school, a playground, the outdoor seating area at Starbucks and the Inn of the America's outdoor  
3 pool. The school and playground are Activity Category C (NAC of 66 dBA) and the remaining two  
4 are Activity Category E (NAC 71 dBA). For the special use areas, modeled exterior noise levels  
5 for the future Build (2040) scenarios determined impacts to NAC for Activity Category C and E  
6 special use sites.

7 Overall, there were three (3) impacted receptors for the Existing condition, three (3) impacted  
8 receptors for the No-Build option and 29 impacted receptors for the proposed improvements  
9 associated with the Alternative 1 - Modified Concept option. The range of increase in existing  
10 sound levels for Category B residential receptors for both the No-Build and the Alternative 1  
11 Modified Concept are 0.7 to 7.8 dBA, respectively. The range of increase in existing sound levels  
12 for Category C and E special use receptors for both the No-Build and the Alternative 1 - Modified  
13 Concept are 0.9 to 5.2 dBA, respectively. TNM did not predict a substantial increase of noise levels  
14 (15 dBA) above existing conditions would occur at any location as a result of the proposed  
15 interchange improvements. Where there are impacts determined for noise sensitive receptors,  
16 abatement measures were evaluated.

17 Three residential areas (Activity Category B) are located adjacent to the study area where noise  
18 impacts were predicted. These are the Vancott, Sandtree and Rochester areas. The Vancott area is  
19 located in the northeast quadrant of the interchange; the Sandtree area is located in the southeast  
20 quadrant of the interchange; and the Rochester area is located in the northwest quadrant of the  
21 interchange. Modeled exterior noise levels for the recommended Alternative 1 – Modified Concept  
22 (2040) scenario predicted impacts to some of the Activity Category B (NAC of 66 dBA) at  
23 residences within the three areas. Therefore, abatement options were evaluated.

24 There are three existing 22 ft noise barriers located on I-95 on the northeast, northwest and  
25 southwest quadrants of the I-95 and Northlake Boulevard interchange. All three barriers evaluated  
26 were not found to be feasible since they did not fulfill the required noise reduction factors of 5 – 7  
27 dBA. Further analysis for the impacted special use locations where evaluated by the Method to  
28 Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations. All three  
29 evaluated barriers were also found to be not be reasonable since they did not meet the required  
30 cost/benefit criteria. Therefore, no new noise barriers or barrier extensions are recommended for  
31 the proposed recommended Alternative 1 – Modified Concept.

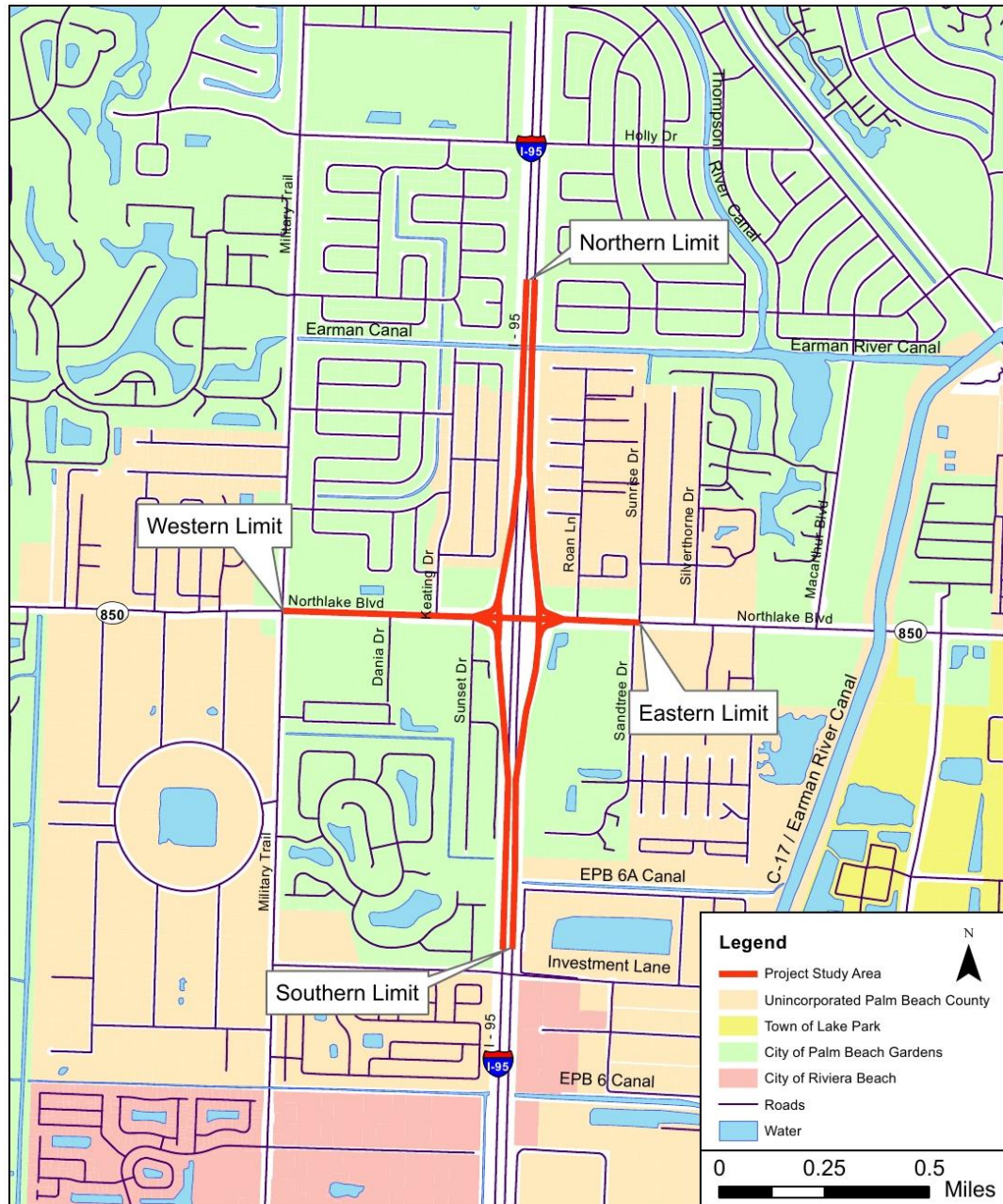
## Section 1

### Introduction

#### 1.1 Project Description

The Florida Department of Transportation (FDOT), District Four, is conducting a federally funded PD&E Study, for the proposed interchange improvements at State Road 9 (I-95) at Northlake Boulevard located in Palm Beach County, Florida. The I-95 proposed interchange improvements are located on Northlake Boulevard within the limits of Keating Drive to Sunrise Drive and on I-95 approximately 0.5 miles north and south of Northlake Boulevard. The project boundaries are depicted in **Figure 1-1** Project Location Map.

This interchange improvement is one of the seventeen interchanges studied as part of the I-95 *Interchange Master Plan*. This plan reexamined 1) the 2003 *I-95 Interchange Master Plan Study* and 2) the I-95 mainline project, which added a High Occupancy Vehicle (HOV) lane and auxiliary lanes from south of Linton Boulevard to north of PGA Boulevard in Palm Beach County and included minor improvements to eight interchanges. Overall, the *I-95 Interchange Master Plan* recommends new short-term and long-term improvements to interchanges based on changes in traffic volumes and updated design standards.



**Figure 1-1 Project Location Map**

## 1.2 Existing Conditions

The existing I-95 is currently a ten-lane divided interstate freeway from north of Blue Heron Boulevard interchange (southern limit) to north of the PGA Boulevard interchange (northern limit) providing four general purpose lanes and one High Occupancy Vehicle (HOV) lane in each direction.

The existing typical section for the I-95 mainline and Northlake Boulevard can be seen in **Figure 1-2** and **Figure 1-3**.

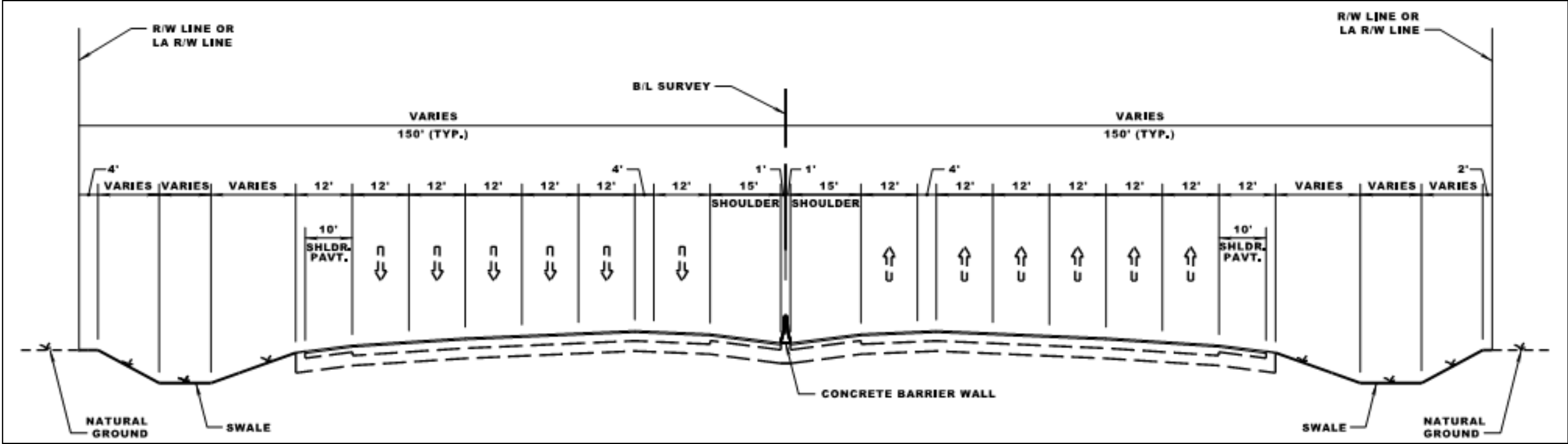


Figure 1-2 Existing Typical Section along I-95 Mainline

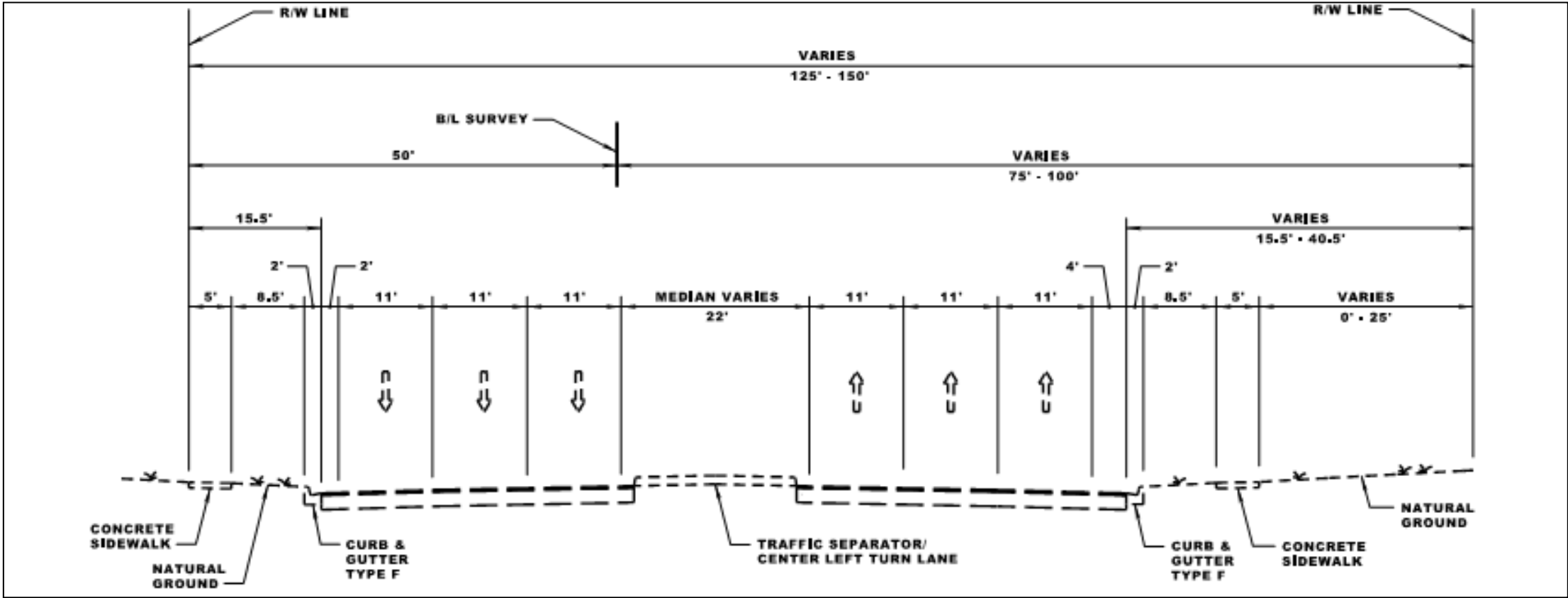


Figure 1-3 Existing Typical Section along Northlake Boulevard

Auxiliary lanes are also provided in both the northbound and southbound directions between PGA Boulevard to the north and Blue Heron Boulevard to the south. North of Northlake Boulevard, I-95 southbound provides one auxiliary lane between PGA Boulevard and Northlake Boulevard for a total of six southbound lanes. South of Northlake Boulevard, I-95 provides one auxiliary lane in each direction between Blue Heron Boulevard and Northlake Boulevard resulting in a twelve-lane section.

The existing right-of-way varies as it approaches the interchange, but the typical right-of-way ranges from approximately 300 to 725 ft. As part of the Strategic Intermodal System (SIS) and one of two major expressways (Florida's Turnpike being the other) that connect the major employment centers and residential areas of Miami-Dade, Broward and Palm Beach Counties, I-95 serves an important role in facilitating the north-south movement of traffic in Southeast Florida.

Under the jurisdiction of Palm Beach County, Northlake Boulevard is a six-lane divided urban other principal arterial. Northlake Boulevard at the I-95 overpass has dual left-turn lanes and a single right-turn lane in both the eastbound and westbound directions to access the I-95 on-ramps. The existing right-of-way varies from approximately 150 to 200 ft west of I-95 and 200 ft east of I-95. Sidewalks and designated bicycle lanes are provided along both sides of Northlake Boulevard within the area of influence.

The interchange at I-95 and Northlake Boulevard is a typical diamond configuration. Adjacent accessible signalized intersections relative to this interchange are located at Keating Drive (west) and Roan Lane and Sandtree Drive/Sunrise Drive (east). The interchange improvements (2040 Design Year Recommended Improvements) are likely to require additional right-of-way. Based on the FDOT's preliminary Long Range Estimate (LRE), the construction cost estimate for the improvements is estimated at approximately \$26.3 million. Detailed cost estimates and right-of-way requirements will be derived as part of the Project Development and Environment (PD&E) Study.

The existing tight diamond interchange provides the following four ramps at Northlake Boulevard:

- Ramp A - southbound on-ramp
- Ramp B - northbound off-ramp
- Ramp C - northbound on-ramp
- Ramp D - southbound off-ramp

The northbound and southbound off-ramps provide two exit lanes from I-95 and transition into four-lane approaches at the ramp intersections with Northlake Boulevard. The four-lane off-ramp approaches consist of two left turn lanes and two channelized right-turn lanes, all under signal control.

The northbound on-ramp provides two receiving lanes at the Northlake Boulevard intersection that merge to one lane approximately 450 ft north of the intersection. The remaining on-ramp lane merges with I-95 approximately 1,000 ft north of the gore area. The northbound on-ramp accommodates two receiving lanes for the eastbound Northlake Boulevard dual left-turn movement and a single, yield-controlled, channelized right-turn lane.

1 The southbound on-ramp accommodates two receiving lanes from the westbound Northlake  
2 Boulevard dual left-turn movement and a single free-flow channelized right-turn lane from  
3 eastbound Northlake Boulevard. The three lanes merge to two lanes prior to the gore area of the  
4 mainline of southbound I-95. The southbound on-ramp provides two lanes along the entire length  
5 of the ramp. The two lanes merge to one lane past the gore area with I-95 and the remaining ramp  
6 lane becomes an auxiliary lane between the Northlake Boulevard and the Blue Heron Boulevard  
7 interchanges.

8 Lane widths for the multilane ramps are 12 ft with 12 ft (10 ft paved) outside shoulders and 8 ft (4  
9 ft paved) inside shoulders. The single lane ramp has a lane width of 15 ft with 6 ft (4 ft paved)  
10 outside shoulder width and 6 ft (2 ft paved) inside shoulder width. The design speed for all the  
11 ramps varies from 40 to 60 mph based on the final as-built plans from FM# 231921-1.

12 The existing geometric elements for the I-95 mainline corridor, interchange ramps and bridge  
13 underpass as well as Northlake Boulevard from Keating Drive to Sandtree Drive/Sunrise Drive  
14 were obtained from the final as-built plans (FM# 231921-1-52-01) available from FDOT District 4.

15 The existing typical section for the I-95 mainline and Northlake Boulevard can be seen in **Figure**  
16 **1-2** and **Figure 1-3**. There are six signalized intersections and two unsignalized intersections at full  
17 or restricted median openings along the Northlake Boulevard corridor within the study area. There  
18 are signalized intersections with the I-95 northbound and southbound ramps, SR 809/Military Trail  
19 and Keating Drive west of I-95 interchange as well as Roan Lane and Sandtree Drive/Sunrise Drive  
20 east of the I-95 interchange. The Northlake Boulevard study segment contains three full median  
21 openings and two partial median opening. The full median openings are located at Dania Drive,  
22 Keating Drive and Sandtree Drive/Sunrise Drive with the partial median openings at the Gardens  
23 Park Plaza and Roan Lane. The signalized intersection located at Roan Lane is a T-intersection that  
24 provides a protected left turn for eastbound vehicles to turn northbound. Southbound vehicles at  
25 Roan Lane can only make a right turn westbound.

26 Multi-modal facilities include pedestrian bicycle and transit. The segment of Northlake Boulevard  
27 within the study area includes 6-ft continuous sidewalk separated from the curb and gutter by grass  
28 swales on the north and south side of the roadway. Pedestrian crosswalks are provided for all four  
29 approaches at the intersections of N Military Trail, and Sandtree Drive/Sunrise Drive. At the  
30 intersection with Roan Lane, pedestrian features are only provided on the north approach.  
31 Pedestrian crosswalks are provided for the north, west, and south approaches at the Keating Drive  
32 intersection. At the interchange intersections with I-95 north and southbound ramps, pedestrian  
33 crosswalks are only provided on the north and south approaches. No pedestrian facilities are  
34 provided on I-95 mainline or ramps.

35 Four foot bicycle lanes are provided on the east and west bound portions of Northlake Boulevard  
36 from Keating Drive to Sandtree Drive/Sunrise Drive. No bicycle facilities are provided on I-95 in  
37 the vicinity of the project area.

38 Northlake Boulevard, in the vicinity of the I-95 interchange has transit service provided by Palm  
39 Tran Route 20. This route serves transit riders along Northlake Boulevard from North Military Trail  
40 to Prosperity Farms Road. There is one stop eastbound at the Gardens Plaza East Entrance and two  
41 stops westbound at Keating Drive and Building 4301 West Entrance located west of the I-95

interchange. East of the I-95 interchange there is one stop eastbound and one stop westbound at the Sandtree Drive/Sunrise Drive intersection.

Utilities within the corridor include water, sewer, a gas transmission line, power distribution and transmission lines, fiber optic and communication. Additional coordination with the identified utility agency owners, shown in **Table 1-1**, is anticipated during the final design stage.

**Table 1-1 Utility Agencies**

UTILITY	CONTACT	ADDRESS	PHONE NO.
Amerigas Propane	Paul Hugelmeyer	7171 Interpace Road West Palm Beach, FL 33407	561-844-1775
AT&T Distribution	Garth Bedward	120 North K Street Room 3D-05 Lake Worth, FL 33460	561-504-9263
Comcast	Anthony Springsteel	10435 Ironwood Road Palm Beach Gardens, FL 33460	561-454-5851
FiberLight, LLC	Troy Gaeta	11700 Great Oakes Way Suite 100 Alpharetta, GA 30022	954-422-5618
Florida Public Utilities	Dale Butcher	209 N. Sapodilla Drive West Palm Beach, FL 33401	561-366-1635
FPL Distribution	Alan Boaz	810 Charlotte Avenue West Palm Beach, FL 33401	561-616-1747
FPL Transmission	George Beck	700 Universe Boulevard, Juno Beach, FL 33408	561-904-3604
FPL Fibernet, LLC	Danny Haskett	9250 W Flagler Street Miami, FL 33174	305-552-2931
Level 3 Communications	Michael Nunez	1025 El Dorado Boulevard Broomfield, CO 33637	720-888-0916
Palm Beach County Traffic Division	Rod Friedel	2300 Jog Road West Palm Beach, FL 33411	561-681-4371
Seacoast Utility Authority	Thomas Skoran, Jr.	4200 Hood Road Palm Beach Gardens, FL 33410	561-627-2900 Ext. 462
TECO Peoples Gas – Palm Beach	Max Chamorro	5101 NW 21 <sup>st</sup> Avenue, Suite 460, Fort Lauderdale, FL 33309	954-453-0812
Windstream Communications	Douglas Pickle	2301 Lucien Way Maitland, FL 32751	407-835-0341

There are two structures within the project limits. Bridge 930516 is a two span single bridge that carries I-95 over Northlake Boulevard and was constructed in 2005. The superstructure consists of pre-stressed AASHTO girders with an out to out width of 183-ft 1-in. The deck carries ten lanes of

1 traffic: five north bound and five south bound. The bridge includes two 10-ft outside shoulders,  
2 two 15-ft inside shoulders, and two 4-ft buffer zones.

3 I-95 bridge culvert over Earman River Canal (Bridge 930178) was constructed in 1967 and  
4 reconstruction in 2004. It is a three barrel box culvert that carries I-95 over the Earman River Canal  
5 and consists of three 10-ft x12-ft cells with a total width of 39-ft and an approximate length of 235  
6 ft. The culvert carries ten lanes of traffic: five north bound and five south bound.

7 Asbestos reports were requested for both structures, but were not available.

### 8 **1.3 Purpose and Need**

9 The purpose of the project is to enhance overall traffic operations at the existing interchange of I-  
10 95 and Northlake Boulevard by providing improvements to achieve acceptable Levels of Service  
11 (LOS) at the interchange in the future condition (2040 Design Year). Conditions along Northlake  
12 Boulevard are anticipated to deteriorate below acceptable LOS standards if no improvements occur  
13 by 2040; the interchange will have insufficient capacity to accommodate the projected travel  
14 demand. The purpose and need for the project is based on the following primary and secondary  
15 criteria, which was obtained from the Efficient Transportation Decision Making (ETDM) Summary  
16 Report (published May 2015).

#### 17 **1.3.1 Primary Criteria**

18 The project is anticipated to improve traffic operations at the I-95 and Northlake Boulevard  
19 interchange and study area roadways/intersections by implementing operational and capacity  
20 improvements to meet the future travel demand projected as a result of Palm Beach County  
21 population and growth.

22 Based upon the traffic operations analysis conducted for the I-95 at Northlake Boulevard  
23 interchange and adjacent signalized intersections during the ETDM Screening and PD&E  
24 phase, the existing and future AM and PM peak hour traffic conditions for the five study  
25 intersections along Northlake Boulevard are shown in Table

##### 26 **1.3.1.1 Capacity/Transportation Demand: Improve Operational Capacity and** 27 **Overall Traffic Operations (Level of Service)**

28 The project is anticipated to improve traffic operations at the I-95 and Northlake Boulevard  
29 interchange and study area roadways/intersections by implementing operational and  
30 capacity improvements to meet the future travel demand projected as a result of Palm  
31 Beach County population and growth.

32 Based upon the traffic operations analysis conducted for the I-95 at Northlake Boulevard  
33 interchange and adjacent signalized intersections during the ETDM Screening and PD&E  
34 phase, the existing and future AM and PM peak hour traffic conditions for the six study  
35 intersections along Northlake Boulevard are shown in **Table 1-2**.

36 Although all the intersections along Northlake Boulevard (except Sunrise Drive/Sandtree  
37 Drive) operate at LOS E or better under existing conditions, it should be noted that several  
38 of the individual through and turning movements at the intersections (which include the I-

95 on/off-ramp approaches) operate at LOS F during both the AM and PM peak periods. Without the proposed improvements, the intersections (except Roan Lane) are projected to experience excessive delays and operate at LOS F, which is below acceptable LOS standards, by the 2040 Design Year.

**Table 1-2 ETDM Existing and Future Intersection LOS**

Intersection	Existing Year 2012/2013				Future Year 2040 No-Build			
	AM		PM		AM		PM	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Keating Drive	C	23.4	D	47.9	E	59.1	F	102.2
SB Ramp Terminal	C	28.3	C	29.3	E	80.0	D	53.0
NB Ramp Terminal	D	53.2	D	36.0	E	60.4	E	78.5
Roan Lane	A	2.4	A	2.2	A	2.8	A	1.0
Sunrise-Sandtree Drive	D	35.6	F	80.7	F	83.2	F	103.8

### 1.3.1.2 Growth Management: Accommodate Future Growth and Development

Commercial retail/office and residential land uses are located adjacent to the interchange. Commercial retail/office uses are located along Northlake Boulevard west of the I-95 southbound ramps. Predominantly residential uses are located to the west of Congress Avenue, while residential and commercial retail uses are located to the east of I-95. According to the Future Land Use Maps for Palm Beach County and the City of Palm Beach Gardens, the project area is to remain relatively unchanged.

The population within the vicinity of the interchange is anticipated to increase by 3% from 2005 to 2035, while the employment is expected to increase by approximately 96% from 2005 to 2035 northeast of the interchange. These projections are based on data derived from the Southeast Regional Planning Model (SERPM) Version 6.5 Managed Lanes Model (upgraded to include specific subarea improvements for the I-95 Interchange Master Plan).

As such, the proposed improvements will be critical in supporting growth within the vicinity of the interchange and the overall vision of the City of Palm Beach Gardens and Palm Beach County.

### 1.3.2 Secondary Criteria

#### 1.3.2.1 Safety: Improve Safety Conditions

The I-95 (SR-9) Interchange at Northlake Boulevard in Palm Beach County Interchange Concept Development Report included a safety analysis of the project area. The following provides a summary of the crash data and analysis results for the three-year period from 2010 through 2012 for the ramp terminal intersections and approaches at the interchange.

There were 51 crashes in 2010, 54 crashes in 2011, and 48 crashes in 2012, to total 153 crashes. The predominant crash type is rear-end crashes accounting for 82 crashes (54%) of the total crashes.

FDOT's high crash location reports (for the period 2010 through 2012) provide those locations that have a higher crash rate as compared to crash rates for similar statewide roadways. The high crash locations along I-95 within the area of influence include:

- I-95 Northbound Off-Ramp (2011)
- I-95 mainline between mileposts 34.6 and 34.8 (2010)

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

#### 1.3.2.2 Emergency Evacuation: Enhance Emergency Evacuation and Response Times

I-95 and Northlake Boulevard (from I-95 to SR A1A) serve as part of the emergency evacuation route network designated by the Florida Division of Emergency Management. Also designated by Palm Beach County as evacuation facilities, I-95 and Northlake Boulevard (from I-95 to SR A1A) are critical in facilitating traffic flows during emergency evacuation periods as they connect other major arterials and highways of the state evacuation route network. The project is anticipated to:

- Improve emergency evacuation capabilities by enhancing connectivity and accessibility to I-95 and other major arterials designated on the state evacuation route network from the west and east, and
- Increase the operational capacity of traffic that can be evacuated during an emergency event.

### 1.3.3 Update to the ETDM Purpose and Need: Capacity/Transportation Demand

The traffic analysis conducted during the PD&E study further identified the long term deficiencies in the year 2040 and the need for operational improvements to meet the level of services standards. Delay extends up to two to three minutes at some intersections. In both the AM and PM peak hour, the southbound and northbound ramp terminals operate at level of service F. **Table 1-3** shows the existing and future LOS for No-Build conditions based on the analysis conducted during the PD&E IMR traffic analysis process. **Table 1-4** shows the I-95

exit ramp queuing up to 66% beyond the available ramp storage causing queue spillback onto I-95. The IMR is contained in the project file.

**Table 1-3 Existing and Future No Build Intersection LOS**

Intersection	Existing (2015)				Future (2040 No-Build)			
	AM		PM		AM		PM	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Military Trail	E	55.3	E	64.6	E	63.2	F	90.4
Keating Drive	B	17.5	D	44.3	E	73.6	F	142.0
I-95 SB Ramp Terminal	C	27.9	C	31.5	F	80.5	F	90.4
I-95 NB Ramp Terminal	E	59.5	D	47.5	F	103.9	F	123.4
Roan Lane	A	1.1	A	2.3	A	0.9	A	2.6
Sunrise Drive	E	62.9	E	68.8	E	70.7	F	98.6

**Table 1-4 Existing and Future No Build Queue Length**

Intersection	Existing (2015)		Future (2040 No-Build)	
	Maximum Queue Length	% Queue Greater than Existing Storage	Maximum Queue Length	% Queue Greater than Existing Storage
	ft	%	ft	%
I-95 Southbound Off Ramp	1608	53%	1746	66%
I-95 Northbound Off Ramp	1433	27%	1250	11%

#### 1.3.4 Update to the ETDM Consistency with Transportation Plan Goals and Objectives

Project coordination occurred with the Palm Beach Metropolitan Planning Organization (MPO) technical committees and governing board, and several local municipalities. The result of this project coordination culminated with the MPO adopting and funding design, right of way and construction on June 15, 2017 through the approval of LRTP Amendment 5. Below are the three plans and programmed funds. See Appendix A for the relevant LRTP, TIP and STIP pages.

1 2040 Long Range Transportation Plan (LRTP) as amended 6/15/2017: Amendment #5: FDOT  
2 has identified specific SIS cost feasible projects and corresponding project costs in its "SIS FY  
3 2019/2020 through FY 2023/2024 Second Five Year Plan" and its "SIS FY 2024 through FY  
4 2040 Long Range Cost Feasible Plan." The LRTP has \$84,200,000 project funds programmed  
5 for Design (2015-2019), Right of Way (2020), and Right of Way and Construction (2021-  
6 2025).

7 Palm Beach MPO Transportation Improvement Program (TIP) FY 2018-2022, Adopted  
8 6/15/2017: Identifies project funds with \$5,100,000 for Preliminary Engineering in FY 2018,  
9 \$58,566,406 for Right-of-Way in FY 2020-2022, and \$15,050,388 (\$14,959 + \$91,200) for  
10 Construction in FY 2022 for total of \$84,248,427.

11 The FDOT Current State TIP (STIP) FY 2018 through >2021 (6/27/2017): Identifies project  
12 funds with \$5,100,000 for Preliminary Engineering in FY 2018, \$61,463,486 for Right of  
13 Way in FY 2020 through >2021, \$15,050.388 for Construction FY >2021.

#### 14 **1.4 Proposed Improvements**

15 The I-95 at Northlake Boulevard interchange is located on I-95 between the PGA Boulevard  
16 interchange (1.73 miles to the north) and the Blue Heron Boulevard (SR 708) interchange (1.76  
17 miles to the south) within the City of Palm Beach Gardens in eastern Palm Beach County. This  
18 interchange project proposes to improve interchange operations to address traffic spillback onto the  
19 I-95, reduce congestion, and increase safety. Based upon the traffic operations documented in the  
20 *I-95 (SR-9) Interchange at Northlake Boulevard in Palm Beach County Interchange Concept*  
21 *Development Report*, the following preliminary short-term and long-term improvements have been  
22 identified for this interchange and carried into this PD&E Study:

##### 23 **1.4.1 2020 Opening Year (Short-Term) Improvements**

- 24 • Add an additional left-turn lane (triple) on the I-95 northbound off-ramp.
- 25 • Add an additional lane (dual) on the I-95 northbound on-ramp and an auxiliary lane on  
26 northbound I-95 to accommodate a free-flow westbound-to-northbound right-turn lane.
- 27 • Add an additional left-turn lane (triple) on the I-95 southbound off-ramp.
- 28 • Add an additional westbound left-turn lane (dual) on Northlake Boulevard at Keating  
29 Drive.
- 30 • Restripe northbound approach of Gardens Towne Square (Keating Drive) to provide an  
31 additional left-turn lane (dual) and one shared through/right-turn lane.

##### 32 **1.4.2 2040 Design Year (Long-Term) Improvements**

- 33 • Add an additional left-turn lane (quadruple) on the I-95 southbound off-ramp.
- 34 • Add one eastbound and westbound through lane to Northlake Boulevard from Military  
35 Trail to MacArthur Boulevard.
- 36 • Restripe northbound approach of Gardens Towne Square (Keating Drive) to provide an  
37 exclusive left-turn lane, one through lane and an exclusive right-turn lane.

- Add an additional eastbound left-turn lane (dual) on Northlake Boulevard at Sandtree Drive/Sunrise Drive.
- Add an exclusive southbound right-turn lane on Sunrise Drive at Northlake Boulevard.

### 1.5 Recommended Modified Concept Alternative

This concept will modify each off-ramp of the existing I-95 tight diamond interchange at Northlake Boulevard. The modifications will widen the existing dual left and right turn lane configuration to include a triple turn lane alignment for both left and right turning maneuvers. The terminal gore point locations on I-95 will remain unchanged. The existing I-95 bridge over Northlake Boulevard will remain unchanged.

Based on the comprehensive evaluation of this PD&E Study, Alternative 1 has emerged to become the recommended alternative. Below are additional details of Alternative 1 proposed improvements:

- I-95 Off-Ramps will be widened to provide triple left turn lanes and triple right turn lanes; and the storage lengths will be extended.
  - For the I-95 northbound off-ramp, provide a second auxiliary lane for 1300 ft.
  - For the I-95 southbound off-ramp, provide a second auxiliary lane for 1300 ft.
- I-95 On-Ramps will have three lanes to receive one dedicated right turn lane and dual left turn lanes from Northlake Boulevard.
  - The I-95 northbound on-ramp has three lanes that will merge to two lanes, joining I-95 as two auxiliary lanes for 1200 ft, then merge to one lane after an additional 1200 ft lane, then merge into I-95 approximately 3500 ft south of the auxiliary lane taper for the northbound exit to PGA Boulevard.
  - The southbound I-95 three lane on-ramp will not change.
- The I-95 mainline bridge over Northlake Boulevard does not require modification.
- At the interchange, Northlake Boulevard will have four (4) through lanes in the eastbound and westbound directions, two (2) left turn lanes and a single lane free-flow right-turn lane to the on-ramps.
- Pedestrians have full mobility along Northlake Boulevard with signalized pedestrian crossings. Bicycle lanes are provided within the Build Alternative project limits on Northlake Boulevard.
- Northlake Boulevard will have one additional lane for eastbound traffic from west of Keating Drive to Sandtree Drive to maintain traffic flow through the I-95 terminals.
- Northlake Boulevard will have one additional lane for westbound traffic from west of Keating Drive to east of Sandtree Drive to maintain traffic flow through the I-95 terminals.
- At Sunset Drive, closure of the northbound right turn should be considered to reduce vehicle conflicts. Access from Sunset Drive to Keating Drive through the shopping center and right-of-way and joint-use agreements should be considered during the design and right-of-way phases.
- At Roan Lane the eastbound left turn, median opening and traffic signal is removed.

## 1.6 No Build Alternative

The No-Build Alternative assumes that no improvements will be made in the study area and that existing conditions will remain. This alternative is often used to compare the costs and benefits of implementing proposed improvements versus the alternative of continuing to use the existing facility. For this study, the No-Build Alternative would mean that the I-95 and Northlake Boulevard interchange would remain a typical diamond configuration interstate facility and no improvements would occur along Northlake Boulevard. The No-Build Alternative will be considered a viable option throughout the PD&E Study.

## 1.7 Purpose of the Noise Study Report

The objectives of this Noise Study Report are to identify noise sensitive sites adjacent to the project corridor, to evaluate existing and future traffic noise levels at the sites with and without the proposed improvements, and to evaluate the need for and effectiveness of noise abatement measures. Additional objectives include the evaluation of construction noise impacts and the identification of noise impact “contours” adjacent to the corridor. The noise evaluation and report were conducted and prepared in accordance to procedures established in 23 Code of Federal Regulations (CFR) 772 and Part 2, Chapter 17 of the FDOT PD&E Manual (7/27/2016) to determine if future noise levels approach or exceed the FHWA NAC at nearby noise sensitive sites.

## Section 2

### Methodology

#### 2.1 Noise Model and Metrics

The FHWA Traffic Noise Model (TNM) version 2.5 computer software was utilized to determine those noise sensitive sites that may approach or exceed the NAC for existing and future scenarios. The model was run for each scenario to compare predicted noise levels to the applicable NAC. This program uses traffic data, roadway configuration and noise mitigation information, receiver location and height, type of propagation (hard site versus soft site), and variations in terrain between the noise source and the receiver to generate average one-hour noise levels.

The noise levels in this analysis are indicated in decibels (dB) using an “A-weighted” scale dBA. For traffic noise purposes the A-weighted scale, which closely approximates the range of frequencies a human ear can hear, is used. The A-weighted equivalent steady-state sound level “Leq” is the noise level that in a stated period contains the same acoustic energy as the time-varying sound level during the same time period, with Leq(h) being the hourly value of Leq. All noise levels presented in this study are hourly equivalent noise levels Leq(h) reported to the nearest 0.1 dBA. Use of the dB(A) and Leq(h) metrics to evaluate traffic noise is consistent with 23 CFR 772 and with FDOT procedures. For reference purposes, **Table 2-1** shows the typical decibel levels associated with common outdoor and indoor activities.

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**Table 2-1 Typical Noise Levels**

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

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

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## 3 2.2 Traffic and Speed Data

4 The TNM traffic input was obtained using data from the FDOT 2013 Quality / Level of Service  
5 Handbook and 2012 Q/LOS Tables, the Methodology Letter of Understanding (MLOU) for SR 9/I-  
6 95 at Northlake Boulevard Interchange and the Interchange Modification Report (IMR) for SR 9/I-  
7 95 at Northlake Boulevard Interchange. The TNM traffic input data included peak hour Truck  
8 Factor (T), peak hour volumes, split per lane as appropriate. For the existing and future condition,  
9 the SR 9/I-95 posted speed is 65 mph and the Northlake Boulevard posted speed is 45 mph. I-95  
10 ramp speeds were 35 mph between the auxiliary lane and traffic signal stop bar. **Table 2-2** provides  
11 a summary of the traffic data for the existing year 2015 and design year 2040 utilized for the traffic  
12 noise analysis. Classification data for medium trucks, heavy trucks, buses and motorcycles was  
13 obtained from nearby FDOT count sites.

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**Table 2-2 TNM Traffic Data**

Roadway/ Highway Segment	Existing 2015 Hourly Volume	LOS C Hourly Volume (No Build)	LOS C Hourly Volume (Build)	Posted MPH	Peak Hour Truck %
<b>I-95 South of Northlake Boulevard</b>	8,680	8,680	8,680	65	4.08 %
<b>I-95 Between ramps at Northlake Boulevard</b>	7,087	7,680	7,680	65	4.08%
<b>I-95 North of Northlake Boulevard</b>	8,007	8,680	8,680	65	4.08%
<b>I-95 NB On Ramps</b>	1,078	2,361*	2,361*	35	3.52 %
<b>I-95 NB Off Ramps</b>	1,617	1,818*	1,818*	35	3.60 %
<b>I-95 SB On Ramps</b>	1,625	1,781*	1,781*	35	3.20 %
<b>I-95 SB Off Ramps</b>	936	1,965*	1,965*	35	2.21 %
<b>Northlake Boulevard (Military to Keating)</b>	2,057	2,793	2,793	45	3.83 %
<b>Northlake Boulevard (Keating to I-95)</b>	2,345	2793	3,772	45	3.83 %
<b>Northlake Boulevard (Between I-95 Ramp Terminals)</b>	2,873	2,793	3,772	45	2.71 %
<b>Northlake Boulevard (I-95 to Sunrise Drive)</b>	2,818	2,793	3,772	45	2.71 %

\*indicates I-95 Ramp Demand Volume

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### 2.3 Noise Abatement Criteria

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The FHWA has NAC for seven land use activity categories. These criteria determine when an impact occurs and when consideration of noise abatement analysis is required. Maximum noise level thresholds have been established for five of these activity categories. These thresholds represent the traffic noise impact level at which abatement measures must be considered. The NAC are listed in **Table 2-3**.

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**Table 2-3 FHWA and FDOT Noise Abatement Criteria**

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

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Source: Florida Department of Transportation (FDOT) PD&amp;E Manual Part 2, Chapter 17, Noise, version May 24, 2011.

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A noise sensitive site is defined as any property (owner occupied, rented, or leased) where frequent exterior human use occurs and where a lowered noise level would be of benefit. Some examples of noise sensitive receivers include residences, picnic areas, parks, churches and hospitals. The

FHWA has established noise levels at which noise abatement must be considered. The NAC vary according to a property's land use category.

Land use in the project area includes primarily commercial and residential developments. These types of land uses are considered Activity Category B, C & E receptors as established by FHWA. The FDOT uses the approach criteria which means within 1 decibel (dB) of the appropriate FHWA NAC. Therefore, the NAC for Activity Category B and C receivers is 66 dBA hourly average. For Activity Category E receivers, the NAC is a 71 dBA hourly average.

Receptor sites in the study area were initially identified using aerial imagery to locate areas that would potentially be noise sensitive. Site visits and field reviews were also conducted to confirm receptor site locations. Currently, the noise sensitive sites in the immediate project area are primarily single and multi-family dwellings. In total, 47 receptor sites were evaluated by this study. Of these, 43 are residential and four (4) are special use locations. Aerial images with receptor locations are provided in **Figures C-1 through C-4** in **Appendix C** of this report.

## **2.4 Noise Abatement Measures**

### **2.4.1 Traffic Management**

Traffic management measures include traffic control devices and signing for prohibition of certain vehicle types, time-use restriction for certain vehicle types, modified speed limits, and exclusive lane designations. Prohibiting vehicle types along Interstate I-95 and Northlake Boulevard is not a viable option since both roadways function as the main route for cars and trucks accessing commercial businesses and residential neighborhoods.

### **2.4.2 Alignment Modifications**

Horizontal and vertical alignment shifts have been considered throughout the PD&E Study. The existing land use and right-of-way constraints throughout the study area limit how far the road can be shifted in any direction. The I-95 bridge over Northlake Boulevard also creates constraints for vertical and horizontal alignment shifts along Northlake Boulevard.

### **2.4.3 Buffer Zones**

Acquisition of real property or interests (predominately undeveloped property) can be used to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise. While land use planning to avoid impacts would be beneficial for future development, it is not applicable to the existing residential developments and homes represented by the three areas evaluated in this report.

### **2.4.4 Noise Barriers**

The construction of noise barriers is the most common type of traffic noise abatement. When considering noise barriers for abatement, the feasibility and reasonableness factors are evaluated relative to each alternative. The feasibility of providing noise abatement is focused on the ability of the noise barrier to provide a noticeable insertion loss. This is the lowering of the noise level as a result of incorporating a noise barrier wall. Barrier analysis was facilitated through the use of TNM 2.5. The feasibility of providing noise abatement is focused on the ability of the noise barrier to provide a reduction of at least 5 dB(A) to impacted receptors. The noise reduction design goal of 7 dB(A) must be obtained by one or more impacted receptors.

1 Failure to achieve the noise reduction design goal will result in the noise abatement measure  
2 being deemed not reasonable.

3 The reasonableness of constructing a noise barrier or barrier extension is focused on the cost  
4 of providing the proposed noise barrier. Where a noise barrier was proposed, TNM was used  
5 to determine the barrier's dimensions and location. Barrier costs were calculated in TNM by  
6 multiplying the length of the barrier by the height to determine the surface area of the barrier  
7 and multiplying this by the \$30 current cost per square foot factor for cost estimating purposes.  
8 The relationship between unit costs and the upper limit for cost reasonableness was based on  
9 maintaining a constant upper limit of 1,400 sq. ft of noise barrier per benefited receiver (PD&E  
10 Manual Part 2, Chapter 17 Noise, 7/27/2016).

11 The feasibility and reasonableness of providing noise barriers at impacted nonresidential land  
12 uses (Activity Category C, D and E land uses) are determined by following the guidance found  
13 in the FDOT publication "A Method to Determine Reasonableness and Feasibility of Noise  
14 Abatement at Special Use Locations" (2009).

#### 15 **2.4.5 Existing Noise Barriers**

16 There are existing noise barriers along the Southwest, Northwest, and Northeast quadrants of  
17 the I-95 and Northlake Boulevard interchange since there are noise sensitive receptors in all of  
18 these areas. The Southeast quadrant is primarily commercial development. The existing noise  
19 barriers are identified on the exhibits provided in **Appendix C**. Based on the construction plans,  
20 they are estimated to be approximately 22 ft high, which is the maximum height that can be  
21 provided for abatement. These noise barriers were also modeled as an existing condition in  
22 TNM analysis.

## Section 3

# Traffic Noise Analysis

### 3.1 Model Validation

To verify the accuracy of the computer noise model for the I-95 and Northlake Boulevard interchange, field monitoring and ambient sound measurements were conducted following procedures in FHWA's guidance document, "Measurement of Highway-Related Noise." Noise monitoring was performed on October 25<sup>th</sup> and 26<sup>th</sup>, 2016 utilizing a Quest SoundPro DL-2-1/3 integrating sound level meter. The meter was calibrated before and after daily monitoring sessions using a Quest QC-10 acoustic calibrator. Both the sound level meter and calibrator meet or exceed American National Standards Institute (ANSI) standards. All monitoring events were ten minutes in duration, with a minimum of three repetitions at each location, and were conducted according to FDOT procedures. Field measurements were taken primarily to verify that traffic noise is the primary source of noise in the area. This allowed validation of the Traffic Noise Model (TNM) under existing highway conditions. See **Appendix B** for the field monitoring locations and measured ambient site conditions.

Traffic data for TNM validation was collected by Traffic Survey Specialists, Inc. on October 25<sup>th</sup> and 26<sup>th</sup>, 2016 using video count stations located along I-95 and Northlake Boulevard. Vehicle speeds were measured using a Stalker Basic Stationary radar gun kit and posted speeds were also noted.

The verification sites were located at a distance from I-95 and Northlake Boulevard that is consistent with noise sensitive sites in proximity to the road. The results of field monitoring for TNM validation are included in **Table 3-1**. The variance between field measured and TNM predicted noise levels were within +/- 3 dBA as specified in Part 2, Chapter 17 of the FDOT PD&E Manual (7/27/2016).

**Table 3-1 TNM Validation Results**

Receiver ID	Location	Date	Time	Average Field Measured Level (dBA)	Computer Predicted Level (dBA)	Variation (dBA)
ML-4	9519 Birmingham Dr.	10/26/16	7:04AM-7:34AM	63.3	60.7	-2.6
ML-5	9141 Birmingham Dr.	10/26/16	7:45AM-8:15AM	65.6	63.6	-2.0
ML-6	8679 40 <sup>th</sup> Terrace N	10/26/16	8:26AM-8:56AM	65.7	63.6	-2.1

### 3.2 Existing Noise and Predicted Noise Levels for Noise Sensitive Sites

Residential receptors are located adjacent to the I-95 and Northlake Boulevard on three of the four quadrants of the existing interchange. Since the residences do not belong to specifically named communities, they are described by the local street names where impacts were identified in the vicinity. **Table 3-2** and **Table 3-3** below include the results of all the evaluated 47 receptors. There were a total of 29 impacted Category B, C & E NAC receptors. Four of these receptors are impacted in all of the scenarios evaluated, the Existing condition, the No Build and the proposed Alternative 1 – Modified Concept.

First, second and third row receptors were initially evaluated for noise impacts. Where impacts were identified, additional receptors were analyzed to determine the number of impacted receptors in an affected area and how those receptors could potentially benefit from additional abatement measures. Where the existing noise barriers are located, maximum abatement has already been provided by the 22 ft noise barriers.

The receptors RL-4 and RL-41 through RL-52 are identified the Vancott area since these residences are centered around this street located in the northeast quadrant of the interchange study area. Impacted residences in this area ranged from 64.6 to 69.8 dBA. One special use location associated with outdoor patio use at the Gardens School of Technology Arts is represented by ML-2 and is impacted both in its existing condition and by the proposed alternative. See **Table 3-2** and **Table 3-3** for a summary of the results.

Another area where impacts were observed is located in the southeast quadrant of the interchange study area near the Sandtree community, south of the commercial development. This is a duplex (two units per building) townhome community with a small community playground. For the proposed build alternative, impacted residences included RL-6 and RL-61 through RL-71. Impacts ranged from 65.7 to 70.6 dBA and the Sandtree playground special use location, RL-60, was also impacted at 73.6 dBA. See **Table 3-2** and **Table 3-3** for a summary of the results.

The Rochester area includes a few impacted residences and the special use swimming pool located at the Inn of the Americas. This area is located on the northwest quadrant of the interchange study area. RL-11 is the swimming pool and its predicted noise level for the proposed alternative is 71.2 dBA. See **Table 3-3** for these results. The residences behind the Inn of the America's, RL-111 through RL-115, are predicted to experience impacts ranging from 66.3 to 67.3 dBA.

Overall, there were three (3) impacted receptors for the Existing condition, three (3) impacted receptors for the No-Build option and 29 impacted receptors for the proposed improvements associated with the Alternative 1 - Modified Concept. The predicted range of increase over existing sound levels for Category B residential receptors for both the No-Build and the Alternative 1 Modified Concept is 0.7 to 7.8 dBA, respectively. The range of increase over existing sound levels for Category C and E special use receptors for both the No-Build and the Alternative 1 Modified Concept are 0.9 to 5.2 dBA, respectively. TNM did not predict a substantial increase of noise levels (15 dBA) above existing conditions would occur at any location as a result of the proposed interchange improvements. Where there are impacts determined for noise sensitive receptors, abatement measures must be evaluated.

**Table 3-2 Results of TNM Analysis at Category B Residential Receptors (66 dBA NAC)**

Receiver ID*	Activity Description (Category B)	Number Of Units	LAeq1h(dBA)		
			Existing (2015)	'No Build' (2040)	Alternative 1 – Modified Concept (2040)
ML-4	Residential	1	60.7	60.7	62.8
ML-5	Residential	1	63.6	63.7	65.4
ML-6	Residential	Vacant Lot	63.6	63.6	65.1
RL-1	Residential	2	62.4	62.5	64.2
RL-2	Residential	2	60.7	60.8	63.7
RL-3	Residential	2	61.9	62.2	63.7
RL-4	Residential	1	64.8	65.3	<b>69.8</b>
RL-6	Residential	2	62.2	62.2	<b>68.7</b>
RL-7	Residential	1	62.0	62.2	63.5
RL-8	Residential	1	61.7	61.9	63.6
RL-9	Residential	1	62.0	62.1	64.0
RL-10	Residential	1	63.4	63.5	64.8
RL-12	Residential	1	63.8	63.8	65.1
RL-13	Residential	1	62.9	62.9	64.6
RL-20	Residential	1	60.1	60.2	62.6
RL-41	Residential	1	63.1	63.4	<b>68.0</b>
RL-42	Residential	1	63.0	63.7	<b>68.7</b>
RL-43	Residential	1	59.6	59.9	65.7
RL-44	Residential	1	57.9	58.3	64.6
RL-45	Residential	1	60.0	60.6	<b>66.3</b>
RL-46	Residential	1	63.2	63.5	<b>68.3</b>
RL-47	Residential	1	61.3	61.5	<b>66.8</b>
RL-48	Residential	1	61.1	61.6	<b>67.1</b>
RL-49	Residential	1	60.1	60.5	<b>66.2</b>
RL-50	Residential	1	62.1	62.8	<b>68.0</b>
RL-51	Residential	1	58.3	58.6	64.8
RL-52	Residential	1	58.6	59.1	65.2
RL-61	Residential	2	61.5	61.5	<b>68.3</b>
RL-62	Residential	2	61.5	61.5	<b>68.2</b>
RL-63	Residential	2	59.2	59.2	<b>66.6</b>

Receiver ID*	Activity Description (Category B)	Number Of Units	LAeq1h(dBA)		
			Existing (2015)	'No Build' (2040)	Alternative 1 – Modified Concept (2040)
RL-64	Residential	2	57.9	57.9	65.7
RL-65	Residential	2	64.8	64.8	<b>70.6</b>
RL-66	Residential	2	62.0	62.0	<b>68.5</b>
RL-67	Residential	2	61.6	61.6	<b>68.4</b>
RL-68	Residential	2	60.4	60.4	<b>67.6</b>
RL-69	Residential	2	59.7	59.7	<b>66.9</b>
RL-70	Residential	2	59.2	59.2	<b>66.6</b>
RL-71	Residential	2	58.8	58.9	<b>66.3</b>
RL-111	Residential	1	<b>66.8</b>	<b>66.9</b>	<b>66.8</b>
RL-112	Residential	1	64.9	65.1	<b>67.3</b>
RL-113	Residential	1	62.5	62.7	<b>66.9</b>
RL-114	Residential	1	63.7	63.9	<b>67.3</b>
RL-115	Residential	1	64.6	64.9	<b>66.3</b>
<b>Range of Noise Increase Over Existing</b>			<b>N/A</b>	<b>0.0 - 0.7</b>	<b>0.0 - 7.8</b>

**Table 3-3 Results of TNM Analysis at Special Use Locations**

Receiver ID	Activity Description	Land Use Activity Category	NAC (dBA)	LAeq1h(dBA)		
				Existing (2015)	'No Build' (2040)	Alternative 1- Modified Concept (2040)
ML-2	School Outdoor Use	C	66	<b>70.7</b>	<b>71.0</b>	<b>72.3</b>
RL-5	Starbucks Outdoor Seating	E	71	68.2	69.1	<b>72.3</b>
RL-11	Hotel Swimming Pool	E	71	70.3	70.7	<b>71.2</b>
RL-60	Sandtree Playground	C	66	<b>68.4</b>	<b>68.4</b>	<b>73.6</b>
<b>Range of Noise Increase Over Existing</b>				<b>N/A</b>	<b>0.0 - 0.9</b>	<b>0.5 – 5.2</b>

### 3.3 Noise Abatement Analysis

Noise barriers reduce noise levels by blocking the sound path between the noise source and the receptor. In order to effectively reduce traffic noise, a noise barrier must be relatively long, continuous (without intermittent openings), and sufficiently tall to provide a reduction in noise levels. Following procedures developed by the FDOT, the minimum requirements for a noise barrier to be considered both feasible and economically reasonable include:

- A noise barrier must provide at least a five (5) dBA reduction in traffic noise for at least two impacted noise sensitive receptors, and also provide at least a seven (7) dBA reduction (i.e., the FDOT's noise reduction design goal) for at least one impacted receptor.

- The feasibility and reasonableness of providing noise barriers at impacted non-residential land uses (Activity Category C and E land uses) was determined following guidance found in the FDOT publication "A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations" (2009).

Three separate noise barriers were evaluated for the effectiveness in providing sound reduction at impacted noise sensitive receptors in the Vancott, Sandtree and Rochester areas. The Vancott and Rochester barriers are proposed extensions of existing noise barriers located along I-95. See **Appendix C, Figures C-1 and C-2**. The Sandtree barrier is a new proposed structure along I-95 on the east side in the southeast quadrant of the interchange study area. Coordinate locations and barrier dimensions are in **Table 3-4**. All three barriers were modeled in TNM at the 22 ft maximum height to determine if it would meet the noise reduction goals of 5 dBA and 7 dBA.

**Table 3-4 Locations of Evaluated 22 ft Noise Barrier or Extension\* of Existing Noise Barrier**

Location/Coordinates	X	Y	Z	Length (ft)
*Vancott Area (Begin)	950,500.4	901,620.6	12.00	905
*Vancott Area (End)	950,571.5	900,991.9	12.00	
Sandtree Area (Begin)	950,393.1	898,621.7	12.00	272
Sandtree Area (End)	950,374.7	898,350.3	12.00	
*Rochester Area (Begin)	950,074.2	901,236.8	12.00	299
*Rochester Area (End)	950,014.3	900,939.6	12.00	

### 3.3.1 Vancott Area Barrier Analysis

A 905 ft long and 22 ft high barrier extension was modeled in TNM to determine noise reduction of impacted receptors in the Vancott area. See **Table 3-5** below. The ML-2 receptor is adjacent to I-95 and is the Gardens School of Technology Arts. This is a special use location with an exterior patio use and is a Category C receptor with a 66 dBA NAC. No other receptor was able to achieve the 5 dBA minimum noise reduction design goal requirement. Therefore, the barrier is not considered feasible.

**Table 3-5 Calculated Noise Reduction Noise Barrier Extension Evaluated for the Vancott Area**

Receiver ID	Calculated Noise Reduction for 22 ft Barrier (dBA) Extension
ML-2	7.2
RL-4	0.5
RL-5	0.1
RL-41	1.0
RL-42	0.3
RL-43	0.4
RL-44	0.3
RL-45	0.3

Receiver ID	Calculated Noise Reduction for 22 ft Barrier (dBA) Extension
RL-46	0.6
RL-47	0.6
RL-48	0.4
RL-49	0.5
RL-51	0.4
RL-52	0.3

1

2 Since the ML-2 special use location did achieve the 7 dBA design goal the Method to  
 3 Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations was  
 4 done and the results are presented in **Table 3-6** below. Since the evaluation of this barrier  
 5 exceeded the "abatement cost factor" of \$995,935/person-hour/ft<sup>2</sup>, the Vancott area noise  
 6 barrier is not considered a reasonable abatement measure.

7

**Table 3-6 Evaluation of the Proposed Vancott Noise Barrier at a Special Use Location**

Item	Criteria	Result
1	Length of proposed noise barrier	905 ft
2	Height of proposed noise barrier	22 ft
3	Multiply item 1 by item 2	19910 sq. ft
4	Average amount of time that a person stays at the site per visit	1 hour
5	Enter the average number of people that use this site per day that will receive at least a five dB(A) benefit from abatement at the site	100 people
6	Multiply item 4 by item 5	100 person hours
7	Divide item 3 by item 6	199
8	Multiply item 7 by \$42,000	\$8,358,000
9	Does item 8 exceed the "abatement cost factor" of \$995,935/person-hour/ft <sup>2</sup>	Yes
10	If item 9 is no, abatement is reasonable	N/A
11	If item 9 is yes, abatement is not reasonable	Not reasonable

8

### 9 3.3.2 Sandtree Area Barrier Analysis

10 A 272 ft long and 22 ft high barrier extension was modeled in TNM to determine noise  
 11 reduction of impacted receptors in the Sandtree area. See **Table 3-7** below. The RL-60 receptor  
 12 which is the Sandtree community playground is a Category C special use location with a 66

- 1 dBA NAC. No receptor was able to achieve the 7 dBA and 5 dBA minimum noise reduction  
 2 design goal requirements. Therefore, the barrier is not considered feasible.

3 **Table 3-7 Calculated Noise Reduction Noise Barrier Evaluated for the Sandtree Area**

Receiver ID	Calculated Noise Reduction for 22 ft New Barrier (dBA)
RL-6	2
RL-60	4.6
RL-61	1.5
RL-62	1
RL-63	1.3
RL-64	1
RL-65	2.9
RL-66	2.0
RL-67	1.3
RL-68	1.5
RL-69	0.9
RL-70	1.4
RL-71	1.3

4

- 5 Since the RL-60 special use location approached the 5 dBA minimum noise reduction for the  
 6 proposed 22 ft barrier segment, the Method to Determine Reasonableness and Feasibility of  
 7 Noise Abatement at Special Use Locations was done and the results are in **Table 3-8** below.  
 8 Since the evaluation of this barrier exceeded the "abatement cost factor" of \$995,935/person-  
 9 hour/ft<sup>2</sup>, the Sandtree area noise barrier is also not considered a reasonable abatement measure.

10 **Table 3-8 Evaluation of the Proposed Sandtree Noise Barrier at a Special Use Location**

Item	Criteria	Result
1	Length of proposed noise barrier	272 ft
2	Height of proposed noise barrier	22 ft
3	Multiply item 1 by item 2	5984 sq. ft
4	Average amount of time that a person stays at the site per visit	1 hour
5	Enter the average number of people that use this site per day that will receive at least a five dB(A) benefit from abatement at the site	20 people
6	Multiply item 4 by item 5	20 person hours

Item	Criteria	Result
7	Divide item 3 by item 6	299
8	Multiply item 7 by \$42,000	\$12,566,400
9	Does item 8 exceed the "abatement cost factor" of \$995,935/person-hour/ft <sup>2</sup>	Yes
10	If item 9 is no, abatement is reasonable	N/A
11	If item 9 is yes, abatement is not reasonable	Not reasonable

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### 3.3.3 Rochester Area Barrier Analysis

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A 299 ft long and 22 ft high barrier extension was modeled in TNM to determine noise reduction of impacted receptors in the Rochester area. See **Table 3-9** below. The RL-11 receptor which is adjacent to I-95 and is the Inn of the Americas swimming pool. This is a special use location with exterior use for a hotel and is a Category E receptor with a 71 dBA NAC. No other receptor was able to achieve the 7 dBA and 5 dBA minimum noise reduction design goal requirements. Therefore, the barrier is not considered feasible.

9

**Table 3-9 Calculated Noise Reduction Noise Barrier Extension Evaluated for the Rochester Area**

Receiver ID	Calculated Noise Reduction for 22 ft Barrier (dBA) Extension
ML-5	1.3
RL-11	4.3
RL-111	2.4
RL-112	0.6
RL-113	0.1
RL-114	0.3
RL-115	3.3

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Since the RL-11 special use location approached the 5 dBA minimum noise reduction for the proposed 22 ft barrier segment, the Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations was done and the results are in **Table 3-10** below. Since, the evaluation of this barrier exceeded the "abatement cost factor" of \$995,935/person-hour/ft<sup>2</sup>, the Rochester area noise barrier is not considered a reasonable abatement measure.

1 **Table 3-10 Evaluation of the Proposed Rochester Noise Barrier at a Special Use Location**

Item	Criteria	Result
1	Length of proposed noise barrier	303 ft
2	Height of proposed noise barrier	22 ft
3	Multiply item 1 by item 2	6666 sq. ft
4	Average amount of time that a person stays at the site per visit	2 hours
5	Enter the average number of people that use this site per day that will receive at least a five dB(A) benefit from abatement at the site	100 people
6	Multiply item 4 by item 5	200 person hours
7	Divide item 3 by item 6	33.33
8	Multiply item 7 by \$42,000	\$1,399,860
9	Does item 8 exceed the "abatement cost factor" of \$995,935/person-hour/ft <sup>2</sup>	Yes
10	If item 9 is no, abatement is reasonable	N/A
11	If item 9 is yes, abatement is not reasonable	Not reasonable

2

## Section 4

### Conclusions

The FHWA TNM version 2.5 computer model and FDOT guidelines were incorporated into the noise analysis for the project area. Future noise levels will increase whether or not the proposed improvements are constructed due to the expected increase in future traffic levels. Results of the model indicate that predicted noise levels will approach, and in some cases exceed, the Activity Category B, C and E NAC at receptors in the project vicinity. The predicted noise level varies according to the location of the residence or special use receptor. TNM did not predict a substantial increase of noise levels (15 dBA) above existing conditions would occur at any location as a result of the proposed interchange improvements.

The FHWA requires that when the noise levels of a proposed federally aided roadway project approach or exceed NAC, noise abatement measures must be evaluated. Overall, there were three (3) impacted receptors for the Existing condition, three (3) impacted receptors for the No-Build option and 29 impacted receptors for the proposed improvements associated with the Alternative 1 - Modified Concept option. The range of increase in existing sound levels for Category B residential receptors for both the No-Build and the Alternative 1 Modified Concept are 0.7 to 7.8 dBA, respectively. The range of increase in existing sound levels for Category C and E special use receptors for both the No-Build and the Alternative 1 Modified Concept are 0.9 to 5.2 dBA, respectively. Since traffic noise impacts are predicted at the Vancott area, Sandtree area and Rochester area for the recommended alternative, Alternative 1 – Modified Concept, abatement measures were considered at the Activity Category B, C and E receptors.

Traffic management and prohibiting vehicle types along Interstate I-95 and Northlake Boulevard is not a viable option since both roadways function as the main route for cars and trucks accessing commercial businesses and residential neighborhoods. Horizontal and vertical alignment shifts have been considered throughout the PD&E Study. The existing land use and right-of-way constraints throughout the study area limit how far the road can be shifted in any direction. The I-95 bridge over Northlake Boulevard also creates additional constraints for vertical and horizontal

alignments shifts. Acquisition of real property or interests (predominately undeveloped property) can be used to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise. While land use planning to avoid impacts would be beneficial for future development, it is not applicable to the existing residential developments, school, business, playground and hotel represented by the three areas evaluated in this report.

There are existing noise barriers along the southwest, northwest, and northeast quadrants of the I-95 and Northlake Boulevard interchange and there are noise sensitive receptors in all of these areas. The southeast quadrant is primarily commercial development and businesses. The existing noise barriers are identified on the exhibits provided in **Appendix C**. Based on the construction plans, they were estimated to be approximately 22 ft high, which is the maximum height that can be provided for abatement. These noise barriers were also modeled as an existing condition in TNM analysis.

When evaluating noise abatement options, the Vancott area and Rochester area included extensions of the existing noise barriers. The Sandtree area evaluation included a new 22 ft high noise barrier along I-95. All three barriers evaluated were not found to be feasible since they did not fulfill the required noise reduction factors (5-7 dBA). Further analysis for the impacted special use locations where evaluated by the Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations. All three evaluated barriers were also found to be not be reasonable since they did not meet the required cost/benefit criteria. Therefore, no new noise barriers or barrier extensions are recommended for the proposed recommended Alternative 1 – Modified Concept.

## Section 5

### Construction Noise and Vibration

Land uses adjacent to I-95 and Northlake Boulevard are identified on the FDOT listing of noise and vibration-sensitive sites (i.e., residences). Construction of the proposed roadway improvements is not expected to have any significant noise or vibration impact. If sensitive land uses develop adjacent to the roadway prior to construction, increased potential for noise or vibration impacts could result. It is anticipated that the application of the *FDOT Standard Specifications for Road and Bridge Construction* will minimize or eliminate potential construction noise and vibration impacts. However, should unanticipated noise or vibration issues arise during the construction process, the Project Engineer, in coordination with the District Noise Specialist and the Contractor, will investigate additional methods of controlling these impacts.

## Section 6

### Community Coordination

In accordance with 23 CFR Part 772, measures will be taken that are prudent and feasible to assure that the location and design of highways are compatible with existing and planned land uses. Local agencies and officials play an important role by ensuring that future residential development does not occur in projected noise impact areas. Coordination with local agencies and officials has been conducted during the development of this study and a copy of the Final Noise Study Report will be provided to appropriate local planning authorities in order to assist in the development of compatible future land uses.

A detailed public involvement program has been carried out for this project since the beginning of the PD&E Study.

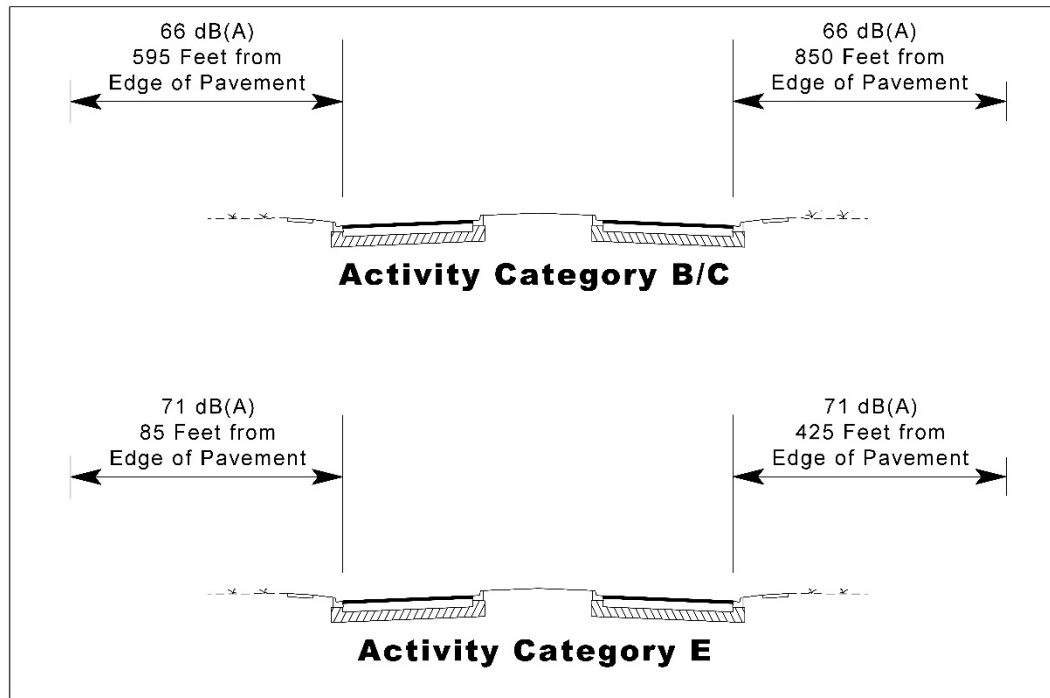
- On November 11, 2015, the Public, Agencies and Elected Officials Kickoff meetings were held. A brief presentation provided the project overview, purpose and need and allowed interested attendees to interact with the project team. A public kickoff meeting summary package contains the notifications and public comments.
- On December 8, 2016, the Alternatives Public Workshop was held and attended by 130 participants. Approximately 1250 notifications were distributed to both owners and occupants within 500 ft of the project limits. Twenty-five people provided written comments. Public comment identified right of way acquisition and noise concerns while also supporting a general need to improve traffic flow. A public workshop summary package contains the meeting notifications, comments and responses.
- On DATE TBD, a public hearing was held for the project. Noise displays were available for public review and project noise specialists attended to discuss noise concerns and answer questions. The formal presentation included discussion of the impacts and abatement measures. A copy of the transcript is in the project file.

## Section 7

### Noise Contours

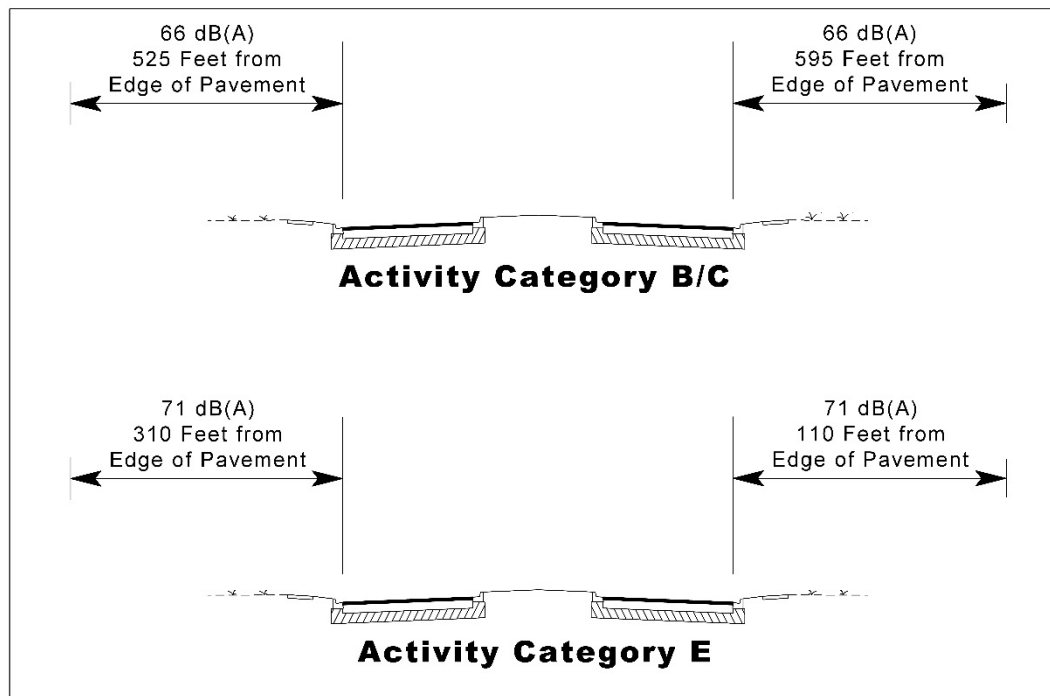
In order to reduce the possibility of additional noise related impacts, noise level contours were developed for the future improved roadway facility. These noise contours delineate the distance from the improved roadway's edge-of-pavement (EOP) where the NAC for each Activity Category B/C and E is expected to be approached in the design year (2040) with the proposed improvements to I-95 and the Northlake Boulevard interchange.

Providing a buffer between a roadway and future noise sensitive land uses is an abatement measure that can minimize/eliminate noise impacts in areas of future development. To encourage the use of this abatement measure through local land use planning and zoning, copies of this report, once finalized, will be shared with local Palm Beach County officials consistent with state requirements found in Part 2, Chapter 17 of the PD&E Manual (7/27/2016), and federal requirements found in 23 CFR Part 772.



1 **Figure 7-1 Noise Contours for Activity Categories B/C and E for the I-95 Mainline**

2



3 **Figure 7-2 Noise Contours for Activity Categories B/C and E for Northlake Boulevard**

## Section 8

## References

23 CFR Part 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise", January 2011. Available from: <http://www.fhwa.dot.gov/environment/noise/>

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. Available from: <http://fhwa.dot.gov/environment/measure/index.htm>

Federal Highway Administration Report Number FHWA-PD-96-009, "FHWA Traffic Noise Model, Version 1.0 User's Guide." January 1998; 192 pages + supplements. Available from McTrans Center, University of Florida, Gainesville, Florida. Also found at the official TNM website: <http://www.trafficnoisemodel.org>

Florida Department of Transportation Policy Number 000-360-005-e, Noise Abatement", September 15, 2005; 1 page. Available at: <http://www2.dot.state.fl.us/proceduraldocuments/procedures/bin/000360005.pdf>

Florida Department of Transportation, "Project Development & Environmental (PD&E) Manual, Part 2, Chapter 17, Noise." July 27, 2016; 30 pages. Available at <http://www.fdot.gov/environment/pubs/pdeman/pdeman-Archive-2016.shtm>

Florida Department of Transportation "Standard Specifications for Road and Bridge Construction." 2004; 974 pages. Available from: <http://www.dot.state.fl.us/specificationsoffice/2004BK/toc.htm>

Florida Statute 335.17, "State highway construction; means of noise abatement." 1989; 1 page. Available from: <http://www.leg.state.fl.us/Statutes/index.cfm?mode=View%20Statutes&SubMenu=1&Appmode=DisplayStatute&SearchString=URL=CH0335/Sec17.htm>

## Appendix A

### Traffic Data

WESTBOUND NORTHLAKE BLVD WEST OF I-95  
PALM BEACH GARDENS, FLORIDA  
COUNTED BY: KEVIN MCNALLY  
COUNTED IN 10 MINUTE INTERVALS

Traffic Survey Specialists, Inc.  
85 SE 4th Avenue, Unit 109  
Delray Beach, Florida 33483  
(561)272-3255

Study Name: WBNLW  
Site Code : 00160230  
Start Date: 11/13/16  
Page : 1

Vehicle group 1

WB NL WEST SIDE 26					A	WB NL WEST SIDE 26					A						Intvl.
From North						From South						From West					
Start	GROUP	GROUP	GROUP	GROUP		GROUP											
Time	4	3	2	1	Left	Thru	Right	5	Left	Thru	Right	Other	Left	Thru	Right	Other	Total
11/13/16																	
18:05	0	1	2	152	7:04	0	0	0	0	0	0	0	0	0	0	0	155
18:20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:35	1	2	0	148	7:14	0	0	0	0	0	0	0	0	0	0	0	151
18:50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:05	0	5	3	201	7:24	0	0	0	0	0	0	0	0	0	0	0	209
19:20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:50	0	5	4	243	7:45	0	0	0	0	0	0	0	0	0	0	0	252
20:05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:20	1	7	4	252	7:55	0	0	0	0	0	0	0	0	0	0	0	264
20:35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:50	0	7	6	241	8:05	0	0	0	0	0	0	0	0	0	0	0	254
21:05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:35	2	8	3	215	8:26	0	0	0	0	0	0	0	0	0	0	0	228
21:50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:05	1	2	12	224	8:36	0	0	0	0	0	0	0	0	0	0	0	239
22:20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:35	1	6	4	254	8:46	0	0	0	0	0	0	0	0	0	0	0	265
Total	6	43	38	1930	0	0	0	0	0	0	0	0	0	0	0	0	2017
% Apr.	0.2	2.1	1.8	95.6	-	-	-	-	-	-	-	-	-	-	-	-	-
% Int.	0.2	2.1	1.8	95.6	-	-	-	-	-	-	-	-	-	-	-	-	-



IGNORE

OCTOBER 26TH, 2016

EASTBOUND NORTHLAKE BLVD WEST OF I-95  
PALM BEACH GARDENS, FLORIDA  
COUNTED BY: KEVIN MCNALLY  
COUNTED IN 10 MINUTE INTERVALS

Traffic Survey Specialists, Inc.  
85 SE 4th Avenue, Unit 109  
Delray Beach, Florida 33483  
(561)272-3255

Study Name: EBNLW  
Site Code : 00160230  
Start Date: 11/13/16  
Page : 1

Vehicle group 1

EB NL WEST SIDE					EB NL WEST SIDE				
From North					From South				
Start	GROUP	GROUP	GROUP	GROUP	GROUP	Left	Thru	Right	Other
Time	4	3	2	1	5	Left	Thru	Right	Other
11/13/16									
18:55	1	1	3	223	7:04	0	0	0	0
19:10	0	0	0	0	7:14	0	0	0	0
19:25	1	6	4	325	7:24	0	0	0	0
19:40	0	0	0	0	7:34	0	0	0	0
19:55	6	6	4	350	7:45	0	1	0	0
20:10	0	0	0	0	7:55	0	2	0	0
20:25	0	0	0	0	8:05	0	0	0	0
20:40	3	6	6	365	8:16	0	0	0	0
20:55	0	0	0	0	8:26	0	0	0	0
21:10	2	5	10	306	8:36	0	0	0	0
21:25	0	0	0	0	8:46	0	0	0	0
21:40	0	2	6	403					
21:55	0	0	0	0					
22:10	0	0	0	0					
22:25	1	3	6	311					
22:40	0	0	0	0					
22:55	0	2	4	373					
23:10	0	0	0	0					
23:25	1	6	4	318					
Total	15	37	47	2974					
% Apr.	0.4	1.2	1.5	96.7					
% Int.	0.4	1.2	1.5	96.6					

↑  
IGNORE

OCTOBER 26TH, 2016

NORTHBOUND I-95 SOUTH OF NORTHLAKE BLVD  
PALM BEACH GARDENS, FLORIDA  
COUNTED BY: KEVIN MCNALLY  
COUNTED IN 10 MINUTE INTERVALS

Traffic Survey Specialists, Inc.  
85 SE 4th Avenue, Unit 109  
Delray Beach, Florida 33483  
(561)272-3255

Study Name: NB95S  
Site Code : 00160230  
Start Date: 11/12/16  
Page : 1

Vehicle group 1

NB 95 SOUTH END					A					NB 95 SOUTH END					A					Intvl.
From North					From East					From South					From West					
Start	GROUP	GROUP	GROUP	GROUP	GROUP					GROUP					GROUP					
Time	4	3	2	1	Left	Thru	Right	5	Left	Thru	Right	Other	Left	Thru	Right	Other	Total			
11/12/16																				
19:50	1	14	26	548	8:37			1	0	0	0	0	0	0	0	0	590			
19:55	2	19	42	493	0			1	0	0	0	0	0	0	0	0	557			
Hour	3	33	68	1041	0			2	0	0	0	0	0	0	0	0	1147			
20:00	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0			
20:05	4	18	47	506	8:47			2	0	0	0	0	0	0	0	0	577			
20:10	4	28	24	471	0			2	0	0	0	0	10/25/16				529			
20:15	0	0	0	0	0			0	0	0	0	0					0			
20:20	5	22	27	500	8:57			1	0	0	0	0					0	555		
20:25	1	19	14	380	0			0	0	0	0	0	0	0	0	0	414			
20:30	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0			
20:35	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0			
20:40	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0			
20:45	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0			
20:50	1	21	11	569	8:26			1	0	0	0	0	0	0	0	0	603			
20:55	0	24	24	513	0			1	0	0	0	0	0	0	0	0	562			
Hour	15	132	147	2939	0			7	0	0	0	0	0	0	0	0	3240			
21:00	0	0	0	0	0			0	0	0	0	0	10/26/16				0			
21:05	4	30	22	567	8:36			2	0	0	0	0					625			
21:10	1	24	18	495	0			3	0	0	0	0					541			
21:15	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0			
21:20	1	26	15	598	8:46			2	0	0	0	0	0	0	0	0	642			
21:25	1	18	11	507	0			0	0	0	0	0	0	0	0	0	537			
Total	25	263	281	6147	0			16	0	0	0	0	0	0	0	0	6732			
% Apr.	0.3	3.9	4.1	91.5	-			100.0	-	-	-	-	-	-	-	-	-			
% Int.	0.3	3.9	4.1	91.3	-			0.2	-	-	-	-	-	-	-	-	-			

✕  
IGNORE

NORTHBOUND I-95 NORTH OF NORTHLAKE BLVD  
PALM BEACH GARDENS, FLORIDA  
COUNTED BY: KEVIN MCNALLY  
COUNTED IN 10 MINUTE INTERVALS

Traffic Survey Specialists, Inc.  
85 SE 4th Avenue, Unit 109  
Delray Beach, Florida 33483  
(561)272-3255

Study Name: NB95N  
Site Code : 00160230  
Start Date: 11/12/16  
Page : 1

Vehicle group 1

NB 95 NORTH END					A	NB 95 NORTH END					A													
From North						From East						From South						From West						
Start	GROUP	GROUP	GROUP	GROUP		GROUP						GROUP						GROUP						Intvl.
Time	4	3	2	1		Left	Thru	Right		5	Left	Thru	Right	Other		Left	Thru	Right	Other		Total			
11/12/16																								
15:20	1	18	6	363	{ 7:11	0		0		0	0	0	0	0		0	0	0	0	0	388			
15:25	1	12	12	436		0		0		2	0	0	0	0	0		0	0	0	0	0	463		
15:30	0	0	0	0		0		0		0	0	0	0	0	0		0	0	0	0	0	0		
15:35	1	11	16	473	{ 7:22	0		0		0	0	0	0	0		0	0	0	0	0	501			
15:40	1	20	15	471		0		0		0	0	0	0	0	0		0	0	0	0	0	507		
15:45	0	0	0	0		0		0		0	0	0	0	0	0		0	0	0	0	0	0		
15:50	1	13	20	557	{ 7:33	0		0		1	0	0	0	0		0	0	0	0	0	592			
15:55	3	21	16	581		0		0		0	0	0	0	0	0		0	0	0	0	0	621		
Hour	8	95	85	2881		0		0		3	0	0	0	0	0		0	0	0	0	0	3072		
16:00	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0	0			
16:05	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0	0			
16:10	1	18	18	494	{ 7:55	0		0		0	0	0	0	0		0	0	0	0	0	531			
16:15	0	17	17	520		0		0		0	0	0	0	0	0		0	0	0	0	0	554		
16:20	0	0	0	0		0		0		0	0	0	0	0	0		0	0	0	0	0	0		
16:25	3	20	21	464	{ 8:05	0		0		1	0	0	0	0		0	0	0	0	0	509			
16:30	0	17	19	559		0		0		1	0	0	0	0	0		0	0	0	0	0	596		
16:35	0	0	0	0		0		0		0	0	0	0	0	0		0	0	0	0	0	0		
16:40	2	16	18	543	{ 8:15	0		0		1	0	0	0	0		0	0	0	0	0	580			
16:45	1	13	21	512		0		0		0	0	0	0	0	0		0	0	0	0	0	547		
16:50	0	0	0	0		0		0		0	0	0	0	0	0		0	0	0	0	0	0		
16:55	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0	0			
Hour	7	101	114	3092		0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3317			
17:00	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0	0			
17:05	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0	0			
17:10	2	13	15	345	{ 7:04	0		0		0	0	0	0	0		0	0	0	0	0	375			
17:15	0	14	15	359		0		0		0	0	0	0	0	0		0	0	0	0	0	388		
17:20	0	0	0	0		0		0		0	0	0	0	0	0		0	0	0	0	0	0		
17:25	1	12	16	384	{ 7:14	0		0		0	0	0	0	0		0	0	0	0	0	413			
17:30	1	12	14	462		0		0		1	0	0	0	0	0		0	0	0	0	0	490		
17:35	0	0	0	0		0		0		0	0	0	0	0	0		0	0	0	0	0	0		
17:40	3	17	21	460	{ 7:24	0		0		0	0	0	0	0		0	0	0	0	0	501			
17:45	1	21	13	504		0		0		0	0	0	0	0	0		0	0	0	0	0	539		
17:50	0	0	0	0		0		0		0	0	0	0	0	0		0	0	0	0	0	0		
17:55	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0	0			
Hour	8	89	94	2514		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2706			
18:00	0	20	18	611	{ 7:45	0		0		1	0	0	0	0		0	0	0	0	0	650			
18:05	1	14	15	552		0		0		0	0	0	0	0	0		0	0	0	0	0	582		
18:10	0	0	0	0		0		0		0	0	0	0	0	0		0	0	0	0	0	0		
18:15	0	24	12	484	{ 7:55	0		0		1	0	0	0	0		0	0	0	0	0	521			
18:20	4	23	16	526		0		0		2	0	0	0	0	0		0	0	0	0	0	571		
18:25	0	0	0	0		0		0		0	0	0	0	0	0		0	0	0	0	0	0		
18:30	1	17	4	485	{ 8:05	0		0		0	0	0	0	0		0	0	0	0	0	507			
18:35	1	13	12	565		0		0		1	0	0	0	0	0		0	0	0	0	0	592		
Total	30	396	370	11710			0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	12518		

↑  
IGNORE

Traffic Survey Specialists, Inc.

NORTHBOUND I-95 NORTH OF NORTHLAKE BLVD  
PALM BEACH GARDENS, FLORIDA  
COUNTED BY: KEVIN MCNALLY  
COUNTED IN 10 MINUTE INTERVALS

85 SE 4th Avenue, Unit 109  
Delray Beach, Florida 33483  
(561)272-3255

Study Name: NB95N  
Site Code : 00160230  
Start Date: 11/12/16  
Page : 2

Vehicle group 1

NB 95 NORTH END					NB 95 NORTH END				
From North					From South				
Start	GROUP	GROUP	GROUP	GROUP	GROUP	Left	Thru	Right	Intvl.
Time	4	3	2	1	5	Left	Thru	Right	Total
% Apr.	0.2	3.1	2.9	93.6	100.0	-	-	-	-
% Int.	0.2	3.1	2.9	93.5	-	-	-	-	-

Study Name: SB95S  
Site Code : 00160230  
Start Date: 11/12/16  
Page : 1

	SB 95 SOUTH END				A	SB 95 SOUTH END				A	SB 95 SOUTH END				A	SB 95 SOUTH END				
	From North					From East					From South					From West				
Start	GROUP	GROUP	GROUP	GROUP		GROUP														Intvl.
Time	4	3	2	1		Left	Thru	Right	5		Left	Thru	Right	Other		Left	Thru	Right	Other	Total
11/12/16																				
18:05	0	17	8	592	{	8:37	0	1	0	0	0	0	0	0		0	0	0	0	618
18:10	4	31	12	564	}	0	0	2	0	0	0	0	0	0		0	0	0	0	613
18:15	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0
18:20	3	26	13	573	{	8:47	0	0	0	0	0	0	0	0		0	0	0	0	615
18:25	1	20	8	494	}	0	0	1	0	0	0	0	0	0		0	0	0	0	524
18:30	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0
18:35	1	28	6	464	{	8:57	0	0	0	0	0	0	0	0		0	0	0	0	499
18:40	3	19	10	458	}	0	0	0	0	0	0	0	0	0		0	0	0	0	490
18:45	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0
18:50	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0
18:55	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0
Hour	12	141	57	3145		0	0	0	4		0	0	0	0		0	0	0	0	3359
19:00	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	0
19:05	2	23	9	620	{	8:26	0	1	0	0	0	0	0	0		0	0	0	0	655
19:10	3	25	8	615	}	0	0	1	0	0	0	0	0	0		0	0	0	0	652
19:15	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0
19:20	0	26	5	537	{	8:36	0	3	0	0	0	0	0	0		0	0	0	0	571
19:25	1	22	7	575	}	0	0	1	0	0	0	0	0	0		0	0	0	0	606
19:30	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0
19:35	1	30	13	620	{	8:46	0	0	0	0	0	0	0	0		0	0	0	0	664
19:40	3	21	16	516	}	0	0	1	0	0	0	0	0	0		0	0	0	0	557
Total	22	288	115	6628		0	0	0	11		0	0	0	0		0	0	0	0	7064
% Apr.	0.3	4.0	1.6	93.9		-	-	-	100.0		-	-	-	-		-	-	-	-	-
% Int.	0.3	4.0	1.6	93.8		-	-	-	0.1		-	-	-	-		-	-	-	-	-

SOUTHBOUND I-95 NORTH OF NORTHLAKE BLVD  
PALM BEACH GARDENS, FLORIDA  
COUNTED BY: KEVIN MCNALLY  
COUNTED IN 10 MINUTE INTERVALS

Traffic Survey Specialists, Inc.  
85 SE 4th Avenue, Unit 109  
Delray Beach, Florida 33483  
(561)272-3255

Study Name: SB95N  
Site Code : 00160230  
Start Date: 11/12/16  
Page : 1

Vehicle group 1

SB 95 NORTH END					A	SB 95 NORTH END					A								
From North					From East					From South					From West				
Start	GROUP	GROUP	GROUP	GROUP	GROUP										Intvl.				
Time	4	3	2	1	Left	Thru	Right	5	Left	Thru	Right	Other	Left	Thru	Right	Other	Total		
11/12/16																			
12:20	3	21	89	548	}	7:11	0	0	0	0	0	0	0	0	0	0	661		
12:25	4	15	52	479		0	0	0	1	0	0	0	0	0	0	0	551		
12:30	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
12:35	0	21	14	621	}	7:22	0	0	0	0	0	0	0	0	0	0	656		
12:40	4	23	8	635		0	0	0	0	0	0	0	0	0	0	0	670		
12:45	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
12:50	4	27	2	692	}	7:33	0	0	0	0	0	0	0	0	0	0	725		
12:55	2	19	2	766		0	0	0	0	0	0	0	0	0	0	0	789		
Hour	17	126	167	3741		0	0	0	1	0	0	0	0	0	0	0	4052		
10/25/16																			
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
13:05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
13:10	0	17	10	710	}	7:55	0	1	0	0	0	0	0	0	0	0	738		
13:15	1	31	1	684		0	0	0	1	0	0	0	0	0	0	0	718		
13:20	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
13:25	1	26	3	585	}	8:05	0	0	0	0	0	0	0	0	0	0	615		
13:30	3	24	0	748		0	0	0	0	0	0	0	0	0	0	0	775		
13:35	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
13:40	0	22	0	693	}	8:15	0	0	0	0	0	0	0	0	0	0	715		
13:45	2	23	0	666		0	0	0	0	0	0	0	0	0	0	0	691		
13:50	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
13:55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Hour	7	143	14	4086	0	0	0	2	0	0	0	0	0	0	0	0	4252		
10/26/16																			
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
14:05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
14:10	1	18	0	502	}	7:04	0	0	0	0	0	0	0	0	0	0	521		
14:15	2	24	1	492		0	0	0	0	0	0	0	0	0	0	0	519		
14:20	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
14:25	2	19	0	662	}	7:14	0	0	0	0	0	0	0	0	0	0	683		
14:30	3	16	0	630		0	0	0	0	0	0	0	0	0	0	0	649		
14:35	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
14:40	1	16	2	611	}	7:24	0	0	0	0	0	0	0	0	0	0	630		
14:45	0	27	1	587		0	0	0	0	0	0	0	0	0	0	0	615		
14:50	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
14:55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Hour	9	120	4	3484	0	0	0	0	0	0	0	0	0	0	0	0	3617		
10/27/16																			
15:00	3	21	1	775	}	7:45	0	0	0	0	0	0	0	0	0	0	800		
15:05	0	31	1	694		0	0	0	0	0	0	0	0	0	0	0	726		
15:10	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
15:15	1	19	1	727	}	7:55	0	0	0	0	0	0	0	0	0	0	748		
15:20	1	26	1	649		0	0	0	0	0	0	0	0	0	0	0	677		
15:25	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		
15:30	1	14	0	687	}	8:05	0	0	0	0	0	0	0	0	0	0	702		
15:35	2	14	6	644		0	0	0	0	0	0	0	0	0	0	0	666		
Total	41	514	195	15487		0	0	0	3	0	0	0	0	0	0	0	0	16240	

↑  
IGNORE

SOUTHBOUND I-95 NORTH OF NORTHLAKE BLVD  
PALM BEACH GARDENS, FLORIDA  
COUNTED BY: KEVIN MCNALLY  
COUNTED IN 10 MINUTE INTERVALS

Study Name: SB95N  
Site Code : 00160230  
Start Date: 11/12/16  
Page : 2

[illegible]

WESTBOUND NORTHLAKE BLVD EAST OF I-95  
PALM BEACH GARDENS, FLORIDA  
COUNTED BY: KEVIN MCNALLY  
COUNTED IN 10 MINUTE INTERVALS

Traffic Survey Specialists, Inc.  
85 SE 4th Avenue, Unit 109  
Delray Beach, Florida 33483  
(561)272-3255

Study Name: WBNLE  
Site Code : 00160230  
Start Date: 11/13/16  
Page : 1

Vehicle group 1

Start Time	WB NL EAST 10 25 From North				A From East	WB NL EAST 10 25 From South				A From West					Intvl.
	GROUP 4	GROUP 3	GROUP 2	GROUP 1		GROUP 5	Left	Thru	Right		Left	Thru	Right	Other	
11/13/16															
16:35	0	3	2	195	7:11	0	0	0	0	0	0	0	0	0	200
16:50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:05	5	6	4	224	7:22	0	0	0	0	0	0	0	0	0	239
17:20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:35	1	5	5	332	7:33	0	2	0	0	0	0	0	0	0	345
17:50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:20	1	6	2	296	7:55	0	0	0	0	0	0	0	0	0	305
18:35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:50	3	8	9	270	8:05	0	0	0	0	0	0	0	0	0	290
19:05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:20	1	5	10	277	8:15	0	0	0	0	0	0	0	0	0	293
19:35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:05	5	11	4	278	8:37	0	0	0	0	0	0	0	0	0	298
20:20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:35	2	6	9	289	8:47	0	0	0	0	0	0	0	0	0	306
20:50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:05	2	5	7	230	8:57	0	1	0	0	0	0	0	0	0	245
Total	20	55	52	2391	0	3	0	0	0	0	0	0	0	0	2521
% Apr.	0.7	2.1	2.0	94.9	-	-	-	-	-	-	-	-	-	-	-
% Int.	0.7	2.1	2.0	94.8	-	-	-	-	-	-	-	-	-	-	-

↑

ignore

OCTOBER 25<sup>TH</sup>, 2016

EASTBOUND NORTHLAKE BLVD EAST OF I-95  
 PALM BEACH GARDENS, FLORIDA  
 COUNTED BY: KEVIN MCNALLY  
 COUNTED IN 10 MINUTE INTERVALS

Traffic Survey Specialists, Inc.  
 85 SE 4th Avenue, Unit 109  
 Delray Beach, Florida 33483  
 (561)272-3255

Study Name: EBNLE  
 Site Code : 00160230  
 Start Date: 11/13/16  
 Page : 1

Vehicle group 1

Start Time	EB NL EAST 11 25 From North				A From East	EB NL EAST 11 25 From South				A From West					Intvl. Total
	GROUP 4	GROUP 3	GROUP 2	GROUP 1		GROUP 5	Left	Thru	Right		Left	Thru	Right	Other	
11/13/16															
15:30	3	6	2	292	7:11	2	0	0	0	0	0	0	0	0	305
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour	3	6	2	292	0	2	0	0	0	0	0	0	0	0	305
16:00	3	7	9	391	7:22	0	0	0	0	0	0	0	0	0	410
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	2	7	5	306	7:33	0	0	0	0	0	0	0	0	0	320
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour	5	14	14	697	0	0	0	0	0	0	0	0	0	0	730
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	2	3	6	402	7:55	2	0	0	0	0	0	0	0	0	415
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	5	9	344	8:05	0	0	0	0	0	0	0	0	0	358
Hour	2	8	15	746	0	2	0	0	0	0	0	0	0	0	773
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	1	7	1	378	8:15	1	0	0	0	0	0	0	0	0	388
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour	1	7	1	378	0	1	0	0	0	0	0	0	0	0	388
19:00	1	5	4	394	8:37	1	0	0	0	0	0	0	0	0	405
19:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:30	3	3	4	327	8:47	1	0	0	0	0	0	0	0	0	338
19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hour	4	8	8	721	0	2	0	0	0	0	0	0	0	0	743
20:00	4	10	7	342	8:57	2	0	0	0	0	0	0	0	0	365
Total	19	53	47	3176	0	9	0	0	0	0	0	0	0	0	3304
% Apr.	0.5	1.6	1.4	96.3	-	-	-	-	-	-	-	-	-	-	-
% Int.	0.5	1.6	1.4	96.1	-	0.2	-	-	-	-	-	-	-	-	-

↑  
 IGNORE

OCTOBER 25<sup>TH</sup>, 2016

# TRAFFIC DATA FOR NOISE STUDIES:

Federal Aid Number(s):	TBD
FPID Number(s):	435803-1-22-02
State/Federal/ County Route No.:	SR 9
Road Name:	I-95
Project Description:	SR 9/I-95 at Northlake Boulevard Interchange PD&E Study
Segment Description:	I-95 from N of Blue Heron Blvd to S of Northlake Blvd
Section Number:	93220000
Mile Post:	From 33.488 To 34.404

Existing Facility:	10LD+1 AUX NB & SB	D=	56.9 %
		T24=	7.40 % of 24 Hour Volume
Year	2015	Tpeak=	3.70 % of Design Hour Volume
Annual Average Daily Traffic (AADT)	166,000	MT=	1.26 % of Design Hour Volume
LOS C Peak Hour Directional Volume	8,680	HT=	2.82 % of Design Hour Volume
Demand Peak Hour Directional Volume:	8,659	B=	0.16 % of Design Hour Volume
Posted Speed:	65 mph	MC=	0.10 % of Design Hour Volume

No-Build Alternative (Design Year):	10LD+1 AUX NB & SB	D=	56.9 %
		T24=	7.40 % of 24 Hour Volume
Year:	2040	Tpeak=	3.70 % of Design Hour Volume
Annual Average Daily Traffic (AADT)	196,000	MT=	1.26 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	8,680	HT=	2.82 % of Design Hour Volume
Demand Peak Hour Directional Volume:	8,990	B=	0.16 % of Design Hour Volume
Posted Speed:	65 mph	MC=	0.10 % of Design Hour Volume

Build Alternative (Design Year):	10LD+1 AUX NB & SB	D=	56.9 %
		T24=	7.40 % of 24 Hour Volume
Year:	2040	Tpeak=	3.70 % of Design Hour Volume
Annual Average Daily Traffic (AADT)	196,000	MT=	1.26 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	8,680	HT=	2.82 % of Design Hour Volume
Demand Peak Hour Directional Volume:	8,990	B=	0.16 % of Design Hour Volume
Posted Speed:	65 mph	MC=	0.10 % of Design Hour Volume

## Notes

1. Design hour percentages typically assumed to be half of daily percentages
2. Classification data for T<sub>24</sub> and T<sub>peak</sub> obtained from MLOU
3. Classification data for Medium Trucks (MT), Heavy Trucks (HT), Buses (B) and Motorcycles (MC) obtained from FDOT Count site 932214

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By:	Godfrey Lamprey, P.E., PTOE	Date:	8/18/2017
	Name		Signature

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis

FDOT Reviewer:	Cesar Martinez, P.E.	Date:	8/23/17
	Name		Signature

# TRAFFIC DATA FOR NOISE STUDIES:

Federal Aid Number(s): TBD  
 FPID Number(s): 435803-1-22-02  
 State/Federal/ County Route No.: SR 9  
 Road Name: I-95  
 Project Description: SR 9/I-95 at Northlake Boulevard Interchange PD&E Study  
 Segment Description: I-95 from S of Northlake Blvd to N of Northlake Blvd.  
 Section Number: 93220000  
 Mile Post: From 34.404 To 34.730

Existing Facility:	10LD	D=	56.9 %
		T24=	7.40 % of 24 Hour Volume
Year	2015	Tpeak=	3.70 % of Design Hour Volume
Annual Average Daily Traffic (AADT)	138,000	MT=	1.26 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	7,680	HT=	2.82 % of Design Hour Volume
Demand Peak Hour Directional Volume:	7,087	B=	0.16 % of Design Hour Volume
Posted Speed:	65 mph	MC=	0.10 % of Design Hour Volume

No-Build Alternative (Design Year):	10LD	D=	56.9 %
		T24=	7.40 % of 24 Hour Volume
Year:	2040	Tpeak=	3.70 % of Design Hour Volume
Annual Average Daily Traffic (AADT)	164,000	MT=	1.26 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	7,680	HT=	2.82 % of Design Hour Volume
Demand Peak Hour Directional Volume:	7,321	B=	0.16 % of Design Hour Volume
Posted Speed:	65 mph	MC=	0.10 % of Design Hour Volume

Build Alternative (Design Year):	10LD	D=	56.9 %
		T24=	7.40 % of 24 Hour Volume
Year:	2040	Tpeak=	3.70 % of Design Hour Volume
Annual Average Daily Traffic (AADT)	164,000	MT=	1.26 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	7,680	HT=	2.82 % of Design Hour Volume
Demand Peak Hour Directional Volume:	7,321	B=	0.16 % of Design Hour Volume
Posted Speed:	65 mph	MC=	0.10 % of Design Hour Volume

## Notes

- Design hour percentages typically assumed to be half of daily percentages
- Classification data for T<sub>24</sub> and T<sub>peak</sub> obtained from MLOU
- Classification data for Medium Trucks (MT), Heavy Trucks (HT), Buses (B) and Motorcycles (MC) obtained from FDOT Count site 932214

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By: Godfrey Lamptey, P.E., PTOE  
 Name Signature Date: 8/18/2017

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis

FDOT Reviewer: Cesar Martinez, P.E.  
 Name Signature Date: 8/23/17

# TRAFFIC DATA FOR NOISE STUDIES:

Federal Aid Number(s):	TBD
FPID Number(s):	435803-1-22-02
State/Federal/ County Route No.:	SR 9
Road Name:	I-95
Project Description:	SR 9/I-95 at Northlake Boulevard Interchange PD&E Study
Segment Description:	I-95 from N of Northlake Boulevard to PGA
Section Number:	93220000
Mile Post:	From 34.730 To 36.520

Existing Facility:	10LD+1 AUX SB ONLY	D=	56.9 %
		T24=	7.40 % of 24 Hour Volume
Year	2015	Tpeak=	3.70 % of Design Hour Volume
Annual Average Daily Traffic (AADT)	166,000	MT=	1.26 % of Design Hour Volume
LOS C Peak Hour Directional Volume	8,680	HT=	2.82 % of Design Hour Volume
Demand Peak Hour Directional Volume:	8,007	B=	0.16 % of Design Hour Volume
Posted Speed:	65 mph	MC=	0.10 % of Design Hour Volume

No-Build Alternative (Design Year):	10LD+1 AUX SB ONLY	D=	56.9 %
		T24=	7.40 % of 24 Hour Volume
Year:	2040	Tpeak=	3.70 % of Design Hour Volume
Annual Average Daily Traffic (AADT)	204,000	MT=	1.26 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	8,680	HT=	2.82 % of Design Hour Volume
Demand Peak Hour Directional Volume:	9,533	B=	0.16 % of Design Hour Volume
Posted Speed:	65 mph	MC=	0.10 % of Design Hour Volume

Build Alternative (Design Year):	10LD+1 AUX SB ONLY	D=	56.9 %
		T24=	7.40 % of 24 Hour Volume
Year:	2040	Tpeak=	3.70 % of Design Hour Volume
Annual Average Daily Traffic (AADT)	204,000	MT=	1.26 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	8,680	HT=	2.82 % of Design Hour Volume
Demand Peak Hour Directional Volume:	9,533	B=	0.16 % of Design Hour Volume
Posted Speed:	65 mph	MC=	0.10 % of Design Hour Volume

## Notes

1. Design hour percentages typically assumed to be half of daily percentages
2. Classification data for T<sub>24</sub> and T<sub>peak</sub> obtained from MLOU
3. Classification data for Medium Trucks (MT), Heavy Trucks (HT), Buses (B) and Motorcycles (MC) obtained from FDOT Count site 932214

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By:	Godfrey Lamprey, P.E., PTOE	Date:	8/18/2017
	Name		Signature

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis

FDOT Reviewer:	Cesar Martinez, P.E.	Date	8/23/17
	Name		Signature

# TRAFFIC DATA FOR NOISE STUDIES:

Federal Aid Number(s):	TBD
FPID Number(s):	435803-1-22-02
State/Federal/ County Route No.:	CR 809A
Road Name:	Northlake Boulevard
Project Description:	SR 9/I-95 at Northlake Boulevard Interchange
Segment Description:	Northlake Boulevard from Military Trail to Keating Drive
Section Number:	93680000
Mile Post:	From Military Trail To Keating Drive

Existing Facility:	6LD	D=	56.6	%
		T24=	8.00	% of 24 Hour Volume
Year	2015	Tpeak=	4.00	% of Design Hour Volume
Annual Average Daily Traffic (AADT)	40,000	MT=	2.31	% of Design Hour Volume
LOS C Peak Hour Directional Volume	2,793	HT=	1.52	% of Design Hour Volume
Demand Peak Hour Directional Volume:	2,057	B=	0.55	% of Design Hour Volume
Posted Speed:	45 mph	MC=	0.16	% of Design Hour Volume

No-Build Alternative (Design Year):	6LD	D=	56.9	%
		T24=	8.00	% of 24 Hour Volume
Year:	2040	Tpeak=	4.00	% of Design Hour Volume
Annual Average Daily Traffic (AADT)	51,000	MT=	2.31	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	2,793	HT=	1.52	% of Design Hour Volume
Demand Peak Hour Directional Volume:	2,763	B=	0.55	% of Design Hour Volume
Posted Speed:	45 mph	MC=	0.16	% of Design Hour Volume

Build Alternative (Design Year):	6LD	D=	56.9	%
		T24=	8.00	% of 24 Hour Volume
Year:	2040	Tpeak=	4.00	% of Design Hour Volume
Annual Average Daily Traffic (AADT)	51,000	MT=	2.31	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	2,793	HT=	1.52	% of Design Hour Volume
Demand Peak Hour Directional Volume:	2,763	B=	0.55	% of Design Hour Volume
Posted Speed:	45 mph	MC=	0.16	% of Design Hour Volume

## Notes

- Design hour percentages typically assumed to be half of daily percentages
- Classification data for  $T_{24}$  and  $T_{peak}$  obtained from MLOU
- Classification data for Medium Trucks (MT), Heavy Trucks (HT), Buses (B) and Motorcycles (MC) obtained from FDOT Count site 935406

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By:	Godfrey Lamprey, P.E., PTOE	Date:	8/18/2017
	Name		Signature

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis

FDOT Reviewer:	Cesar Martinez, P.E.	Date:	8/23/17
	Name		Signature

# TRAFFIC DATA FOR NOISE STUDIES:

Federal Aid Number(s):	TBD
FPID Number(s):	435803-1-22-02
State/Federal/ County Route No.:	CR 809A
Road Name:	Northlake Boulevard
Project Description:	SR 9/I-95 at Northlake Boulevard Interchange
Segment Description:	Northlake Boulevard from Keating Drive to I-95
Section Number:	93680000
Mile Post:	From Keating Drive To I-95

Existing Facility:	6LD	D=	56.6 %
		T24=	8.00 % of 24 Hour Volume
Year	2015	Tpeak=	4.00 % of Design Hour Volume
Annual Average Daily Traffic (AADT)	54,000	MT=	2.31 % of Design Hour Volume
LOS C Peak Hour Directional Volume	2,793	HT=	1.52 % of Design Hour Volume
Demand Peak Hour Directional Volume:	2,345	B=	0.55 % of Design Hour Volume
Posted Speed:	45 mph	MC=	0.16 % of Design Hour Volume

No-Build Alternative (Design Year):	6LD	D=	56.9 %
		T24=	8.00 % of 24 Hour Volume
Year:	2040	Tpeak=	4.00 % of Design Hour Volume
Annual Average Daily Traffic (AADT)	68,000	MT=	2.31 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	2,793	HT=	1.52 % of Design Hour Volume
Demand Peak Hour Directional Volume:	3,467	B=	0.55 % of Design Hour Volume
Posted Speed:	45 mph	MC=	0.16 % of Design Hour Volume

Build Alternative (Design Year):	8LD	D=	56.9 %
		T24=	8.00 % of 24 Hour Volume
Year:	2040	Tpeak=	4.00 % of Design Hour Volume
Annual Average Daily Traffic (AADT)	68,000	MT=	2.31 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	3,772	HT=	1.52 % of Design Hour Volume
Demand Peak Hour Directional Volume:	3,467	B=	0.55 % of Design Hour Volume
Posted Speed:	45 mph	MC=	0.16 % of Design Hour Volume

## Notes

1. Design hour percentages typically assumed to be half of daily percentages
2. Classification data for T<sub>24</sub> and T<sub>peak</sub> obtained from MLOU
3. Classification data for Medium Trucks (MT), Heavy Trucks (HT), Buses (B) and Motorcycles (MC) obtained from FDOT Count site 935406

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By:	Godfrey Lamprey, P.E., PTOE	Date:	8/18/2017
	Name		Signature

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis

FDOT Reviewer:	Cesar Martinez, P.E.	Date:	8/23/17
	Name		Signature

# TRAFFIC DATA FOR NOISE STUDIES:

Federal Aid Number(s):	TBD
FPID Number(s):	435803-1-22-02
State/Federal/ County Route No.:	CR 809A
Road Name:	Northlake Boulevard
Project Description:	SR 9/I-95 at Northlake Boulevard Interchange
Segment Description:	Northlake Boulevard Between I-95 NB & SB Ramp Terminals
Section Number:	93680000
Mile Post:	From I-95 SB To I-95 NB

Existing Facility:	6LD	D=	56.6%
Year	2015	T24=	8.00% of 24 Hour Volume
Annual Average Daily Traffic (AADT)	54,000	Tpeak=	4.00% of Design Hour Volume
LOS C Peak Hour Directional Volume	2,793	MT=	1.78% of Design Hour Volume
Demand Peak Hour Directional Volume:	2,873	HT=	0.93% of Design Hour Volume
Posted Speed:	45 mph	B=	0.45% of Design Hour Volume
		MC=	0.20% of Design Hour Volume

No-Build Alternative (Design Year):	6LD	D=	56.9%
Year:	2040	T24=	8.00% of 24 Hour Volume
Annual Average Daily Traffic (AADT)	64,000	Tpeak=	4.00% of Design Hour Volume
LOS C Peak Hour Directional Volume:	2,793	MT=	1.78% of Design Hour Volume
Demand Peak Hour Directional Volume:	3,555	HT=	0.93% of Design Hour Volume
Posted Speed:	45 mph	B=	0.45% of Design Hour Volume
		MC=	0.20% of Design Hour Volume

Build Alternative (Design Year):	8LD	D=	56.9%
Year:	2040	T24=	8.00% of 24 Hour Volume
Annual Average Daily Traffic (AADT)	64,000	Tpeak=	4.00% of Design Hour Volume
LOS C Peak Hour Directional Volume:	3,772	MT=	1.78% of Design Hour Volume
Demand Peak Hour Directional Volume:	3,555	HT=	0.93% of Design Hour Volume
Posted Speed:	45 mph	B=	0.45% of Design Hour Volume
		MC=	0.20% of Design Hour Volume

## Notes

1. Design hour percentages typically assumed to be half of daily percentages
2. Classification data for  $T_{24}$  and  $T_{peak}$  obtained from MLOU
3. Classification data for Medium Trucks (MT), Heavy Trucks (HT), Buses (B) and Motorcycles (MC) obtained from FDOT Count site 935406

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By:	Godfrey Lamprey, P.E., PTOE	Date:	8/18/2017
	Name		Signature

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis

FDOT Reviewer:	Cesar Martinez, P.E.	Date:	8/23/17
	Name		Signature

# TRAFFIC DATA FOR NOISE STUDIES:

Federal Aid Number(s):	TBD
FPID Number(s):	435803-1-22-02
State/Federal/ County Route No.:	CR 809A
Road Name:	Northlake Boulevard
Project Description:	SR 9/I-95 at Northlake Boulevard Interchange
Segment Description:	Northlake Boulevard from I-95 to Sunrise Drive
Section Number:	93680000
Mile Post:	From I-95 To Sunrise Drive

Existing Facility:	6LD	D=	56.6 %
Year	2015	T24=	8.00 % of 24 Hour Volume
Annual Average Daily Traffic (AADT)	55,000	Tpeak=	4.00 % of Design Hour Volume
LOS C Peak Hour Directional Volume	2,793	MT=	1.78 % of Design Hour Volume
Demand Peak Hour Directional Volume:	2,818	HT=	0.93 % of Design Hour Volume
Posted Speed:	45 mph	B=	0.45 % of Design Hour Volume
		MC=	0.20 % of Design Hour Volume

No-Build Alternative (Design Year):	6LD	D=	56.9 %
Year:	2040	T24=	8.00 % of 24 Hour Volume
Annual Average Daily Traffic (AADT)	66,000	Tpeak=	4.00 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	2,793	MT=	1.78 % of Design Hour Volume
Demand Peak Hour Directional Volume:	3,940	HT=	0.93 % of Design Hour Volume
Posted Speed:	45 mph	B=	0.45 % of Design Hour Volume
		MC=	0.20 % of Design Hour Volume

Build Alternative (Design Year):	8LD	D=	56.9 %
Year:	2040	T24=	8.00 % of 24 Hour Volume
Annual Average Daily Traffic (AADT)	66,000	Tpeak=	4.00 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	3,772	MT=	1.78 % of Design Hour Volume
Demand Peak Hour Directional Volume:	3,940	HT=	0.93 % of Design Hour Volume
Posted Speed:	45 mph	B=	0.45 % of Design Hour Volume
		MC=	0.20 % of Design Hour Volume

## Notes

1. Design hour percentages typically assumed to be half of daily percentages
2. Classification data for  $T_{24}$  and  $T_{peak}$  obtained from MLOU
3. Classification data for Medium Trucks (MT), Heavy Trucks (HT), Buses (B) and Motorcycles (MC) obtained from FDOT Count site 935406

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By:	Godfrey Lamprey, P.E., PTOE	Date:	8/18/2017
	Name		Signature

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis

FDOT Reviewer:	Cesar Martinez, P.E.	Date	8/23/17
	Name		Signature

# TRAFFIC DATA FOR NOISE STUDIES:

Federal Aid Number(s):	TBD
FPID Number(s):	435803-1-22-02
State/Federal/ County Route No.:	SR 9
Road Name:	I-95 Ramps to / from Northlake Boulevard
Project Description:	SR 9/I-95 at Northlake Boulevard Interchange
Segment Description:	I-95 Northbound On-Ramp from Northlake Boulevard
Section Number:	93220083
Mile Post:	From Northlake B To I-95

Existing Facility:	1L	D=	100%
Year	2015	T24=	7.10 % of 24 Hour Volume
Annual Average Daily Traffic (AADT)	16,000	Tpeak=	3.55 % of Design Hour Volume
LOS C Peak Hour Directional Volume	840	MT=	0.91 % of Design Hour Volume
Demand Peak Hour Directional Volume:	1,078	HT=	2.61 % of Design Hour Volume
Advisory Speed:	35 mph	B=	0.11 % of Design Hour Volume
		MC=	0.44 % of Design Hour Volume

No-Build Alternative (Design Year):	1L	D=	100%
Year:	2040	T24=	7.10 % of 24 Hour Volume
Annual Average Daily Traffic (AADT)	21,000	Tpeak=	3.55 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	840	MT=	0.91 % of Design Hour Volume
Demand Peak Hour Directional Volume:	2,361	HT=	2.61 % of Design Hour Volume
Advisory Speed:	35 mph	B=	0.11 % of Design Hour Volume
		MC=	0.44 % of Design Hour Volume

Build Alternative (Design Year):	2L	D=	100%
Year:	2040	T24=	7.10 % of 24 Hour Volume
Annual Average Daily Traffic (AADT)	21,000	Tpeak=	3.55 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	2,560	MT=	0.91 % of Design Hour Volume
Demand Peak Hour Directional Volume:	2,361	HT=	2.61 % of Design Hour Volume
Advisory Speed:	35 mph	B=	0.11 % of Design Hour Volume
		MC=	0.44 % of Design Hour Volume

## Notes

1. LOS C Volumes for Ramps based on Uninterrupted Flow Highways Criteria
2. Design hour percentages typically assumed to be half of daily percentages
3. Classification data for  $T_{24}$  and  $T_{peak}$  obtained from MLOU
4. Classification data for Medium Trucks (MT), Heavy Trucks (HT), Buses (B) and Motorcycles (MC) obtained from existing traffic data

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By:

Godfrey Lamprey, P.E., PTOE  
Name

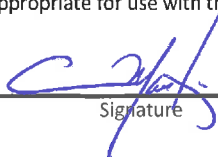
  
Signature

Date: 8/18/2017

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis

FDOT Reviewer:

Cesar Martinez, P.E.  
Name

  
Signature

Date 8/23/17

# TRAFFIC DATA FOR NOISE STUDIES:

Federal Aid Number(s):	TBD
FPID Number(s):	435803-1-22-02
State/Federal/ County Route No.:	SR 9
Road Name:	I-95 Ramps to / from Northlake Boulevard
Project Description:	SR 9/I-95 at Northlake Boulevard Interchange
Segment Description:	I-95 Northbound Off-Ramp to Northlake Boulevard
Section Number:	93220082
Mile Post:	From I-95 To Northlake Boulevard

Existing Facility:	2L	D=	100 %
Year	2015	T24=	7.10 % of 24 Hour Volume
Annual Average Daily Traffic (AADT)	12,000	Tpeak=	3.55 % of Design Hour Volume
LOS C Peak Hour Directional Volume	2,560	MT=	2.85 % of Design Hour Volume
Demand Peak Hour Directional Volume:	1,617	HT=	0.75 % of Design Hour Volume
Advisory Speed:	35 mph	B=	0.21 % of Design Hour Volume
		MC=	0.07 % of Design Hour Volume

No-Build Alternative (Design Year):	2L	D=	100 %
Year:	2040	T24=	7.10 % of 24 Hour Volume
Annual Average Daily Traffic (AADT)	14,000	Tpeak=	3.55 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	2,560	MT=	2.85 % of Design Hour Volume
Demand Peak Hour Directional Volume:	1,818	HT=	0.75 % of Design Hour Volume
Advisory Speed:	35 mph	B=	0.21 % of Design Hour Volume
		MC=	0.07 % of Design Hour Volume

Build Alternative (Design Year):	2L	D=	100 %
Year:	2040	T24=	7.10 % of 24 Hour Volume
Annual Average Daily Traffic (AADT)	14,000	Tpeak=	3.55 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	2,560	MT=	2.85 % of Design Hour Volume
Demand Peak Hour Directional Volume:	1,818	HT=	0.75 % of Design Hour Volume
Advisory Speed:	35 mph	B=	0.21 % of Design Hour Volume
		MC=	0.07 % of Design Hour Volume

## Notes

1. LOS C Volumes for Ramps based on Uninterrupted Flow Highways Criteria
2. Design hour percentages typically assumed to be half of daily percentages
3. Classification data for T<sub>24</sub> and T<sub>peak</sub> obtained from MLOU
4. Classification data for Medium Trucks (MT), Heavy Trucks (HT), Buses (B) and Motorcycles (MC) obtained from existing traffic data

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By: Godfrey Lamprey, P.E., PTOE   
Name Signature

Date: 8/18/2017

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis

FDOT Reviewer: Cesar Martinez P.E.   
Name Signature

Date: 8/23/17

# TRAFFIC DATA FOR NOISE STUDIES:

Federal Aid Number(s):	TBD
FPID Number(s):	435803-1-22-02
State/Federal/ County Route No.:	SR 9
Road Name:	I-95 Ramps to / from Northlake Boulevard
Project Description:	SR 9/I-95 at Northlake Boulevard Interchange
Segment Description:	I-95 Southbound On-Ramp from Northlake Boulevard
Section Number:	93220080
Mile Post:	From Northlake B To I-95

Existing Facility:	2L	D=	100	%
Year	2015	T24=	5.40	% of 24 Hour Volume
Annual Average Daily Traffic (AADT)	16,000	Tpeak=	2.70	% of Design Hour Volume
LOS C Peak Hour Directional Volume	2,560	MT=	1.23	% of Design Hour Volume
Demand Peak Hour Directional Volume:	1,625	HT=	1.97	% of Design Hour Volume
Advisory Speed:	35 mph	B=	0.15	% of Design Hour Volume
		MC=	0.19	% of Design Hour Volume


No-Build Alternative (Design Year):	2L	D=	100	%
Year:	2040	T24=	5.40	% of 24 Hour Volume
Annual Average Daily Traffic (AADT)	18,000	Tpeak=	2.70	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	2,560	MT=	1.23	% of Design Hour Volume
Demand Peak Hour Directional Volume:	1,781	HT=	1.97	% of Design Hour Volume
Advisory Speed:	35 mph	B=	0.15	% of Design Hour Volume
		MC=	0.19	% of Design Hour Volume

Build Alternative (Design Year):	2L	D=	100	%
Year:	2040	T24=	5.40	% of 24 Hour Volume
Annual Average Daily Traffic (AADT)	18,000	Tpeak=	2.70	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	2,560	MT=	1.23	% of Design Hour Volume
Demand Peak Hour Directional Volume:	1,781	HT=	1.97	% of Design Hour Volume
Advisory Speed:	35 mph	B=	0.15	% of Design Hour Volume
		MC=	0.19	% of Design Hour Volume

## Notes

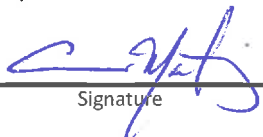
1. LOS C Volumes for Ramps based on Uninterrupted Flow Highways Criteria
2. Design hour percentages typically assumed to be half of daily percentages
3. Classification data for T<sub>24</sub> and T<sub>peak</sub> obtained from MLOU
4. Classification data for Medium Trucks (MT), Heavy Trucks (HT), Buses (B) and Motorcycles (MC) obtained from existing traffic data

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By: Godfrey Lamprey, P.E., PTOE  Date: 8/18/2017

Name Signature

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis

FDOT Reviewer: Cesar Martinez, P.E.  Date: 8/23/17

Name Signature

# TRAFFIC DATA FOR NOISE STUDIES:

Federal Aid Number(s):	TBD
FPID Number(s):	435803-1-22-02
State/Federal/ County Route No.:	SR 9
Road Name:	I-95 Ramps to / from Northlake Boulevard
Project Description:	SR 9/I-95 at Northlake Boulevard Interchange
Segment Description:	I-95 Southbound Off-Ramp to Northlake Boulevard
Section Number:	93220081
Mile Post:	From I-95 To Northlake Boulevard

Existing Facility:	2L	D=	100 %
Year	2015	T24=	5.40 % of 24 Hour Volume
Annual Average Daily Traffic (AADT)	12,000	Tpeak=	2.70 % of Design Hour Volume
LOS C Peak Hour Directional Volume	2,560	MT=	1.04 % of Design Hour Volume
Demand Peak Hour Directional Volume:	936	HT=	1.17 % of Design Hour Volume
Advisory Speed:	35 mph	B=	0.16 % of Design Hour Volume
		MC=	0.20 % of Design Hour Volume

No-Build Alternative (Design Year):	2L	D=	100 %
Year:	2040	T24=	5.40 % of 24 Hour Volume
Annual Average Daily Traffic (AADT)	19,000	Tpeak=	2.70 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	2,560	MT=	1.04 % of Design Hour Volume
Demand Peak Hour Directional Volume:	1,965	HT=	1.17 % of Design Hour Volume
Advisory Speed:	35 mph	B=	0.16 % of Design Hour Volume
		MC=	0.20 % of Design Hour Volume

Build Alternative (Design Year):	2L	D=	100 %
Year:	2040	T24=	5.40 % of 24 Hour Volume
Annual Average Daily Traffic (AADT)	19,000	Tpeak=	2.70 % of Design Hour Volume
LOS C Peak Hour Directional Volume:	2,560	MT=	1.04 % of Design Hour Volume
Demand Peak Hour Directional Volume:	1,965	HT=	1.17 % of Design Hour Volume
Advisory Speed:	35 mph	B=	0.16 % of Design Hour Volume
		MC=	0.20 % of Design Hour Volume

## Notes

1. LOS C Volumes for Ramps based on Uninterrupted Flow Highways Criteria
2. Design hour percentages typically assumed to be half of daily percentages
3. Classification data for T<sub>24</sub> and T<sub>peak</sub> obtained from MLOU
4. Classification data for Medium Trucks (MT), Heavy Trucks (HT), Buses (B) and Motorcycles (MC) obtained from existing traffic data

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By: Godfrey Lamprey, P.E., PTOE  Date: 8/18/2017

Name Signature

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis

FDOT Reviewer: Cesar Hernandez, P.E.  Date: 8/23/17

Name Signature

# ATTACHMENTS

## PROJECT TRAFFIC FORECAST

### Future Annual Average Daily Traffic (AADT) Forecasts

The AADT forecast volumes for this IMR Study was developed by FDOT District 4. The traffic forecasting methodology used for each intersection approach was based on the 2015 AADT (from field), and 2010 and 2040 SERPM 7.0 model volumes. The 2015 model volume was interpolated using 2010 and 2040 model volumes. Then the differences of 2015 AADT and interpolated 2015 forecasted AADT from model was calculated. The recommended 2040 AADT were calculated by applying this difference to the 2040 SERPM 7.0 model volumes. Then the 2020 and 2030 volumes were interpolated using 2015 AADT and recommended 2040 volumes. For the roadway segments where the SERPM 7 2040 model volumes are lower than the SERPM 7 2010 model volumes, or are not included in the SERPM 7 network, the future 2020, 2030, and 2040 AADTs were calculated using 2015 AADT and a compound growth factor of 0.5%. For all the roadway links, the 2015 and 2040 AADT has been compared, and a minimum compound growth rate of 0.5% has been adopted. The recommended future AADTs are provided in **Attachment B**.

### Traffic Factors

Directional Distribution (D) and Daily Truck ( $T_{24}$ ) factors were estimated from the average of the historical data from the FDOT stations and the existing machine counts obtained from the I-95 Interchange PD&E Studies Traffic Data Collection & Traffic Projections Report. The recommended K, D and  $T_{24}$  factors for the I-95 mainline, ramps and arterial segments are provided in the **Table 1** below.

Table 1 Traffic Factors					
Roadway	K <sup>(1)</sup>	D <sup>(2)</sup>	$T_{24}$ <sup>(3)</sup>	PHF <sup>(1)</sup>	MOCF
I-95 Mainline	8.0%	56.9%	7.4%	0.95	N/A
I-95 NB Ramps	9.0%	100%	7.1%	0.95	N/A
I-95 SB Ramps	9.0%	100%	5.4%	0.95	N/A
Northlake Blvd.	9.0%	56.6%	8.0%	0.95	N/A
Military Trail	9.0%	56.3%	4.4%	0.95	N/A
Sunrise Drive	9.0%	65.0%	4.3%	0.95	N/A
Keating Drive	9.0%	55.4%	4.3%	0.95	N/A

Sources:

1. Project Traffic Forecasting Handbook
2. Based on average from Traffic Counts Data Collected for PD&E Study and FDOT Traffic online 2014
3. Traffic Counts Data Collected for PD&E Study

Note that the D factors shown in Table 1 are different from the values from the MLOU for this study. This is due to the fact that the D Factors used in the MLOU was based on the existing traffic counts information. However, during the development and balancing the volumes along I-95 with the interchange ramp volumes it was necessary to adjust the D factors to be able to balance the volumes. The new

**Generalized Peak Hour Directional Volumes for Florida's Urbanized Areas<sup>1</sup>**

**TABLE 7**

12/18/12

INTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS					
Class I (40 mph or higher posted speed limit)					
Lanes	Median	B	C	D	E
1	Undivided	*	830	880	**
2	Divided	*	1,910	2,000	**
3	Divided	*	2,940	3,020	**
4	Divided	*	3,970	4,040	**
Class II (35 mph or slower posted speed limit)					
Lanes	Median	B	C	D	E
1	Undivided	*	370	750	800
2	Divided	*	730	1,630	1,700
3	Divided	*	1,170	2,520	2,560
4	Divided	*	1,610	3,390	3,420
Non-State Signalized Roadway Adjustments					
(Alter corresponding state volumes by the indicated percent.)					
Non-State Signalized Roadways - 10%					
Median & Turn Lane Adjustments					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors	
1	Divided	Yes	No	+5%	
1	Undivided	No	No	-20%	
Multi	Undivided	Yes	No	-5%	
Multi	Undivided	No	No	-25%	
			Yes	+ 5%	
One-Way Facility Adjustment					
Multiply the corresponding directional volumes in this table by 1.2					

UNINTERRUPTED FLOW FACILITIES					
FREEWAYS					
Lanes	B	C	D	E	
2	2,260	3,020	3,660	3,940	
3	3,360	4,580	5,500	6,080	
4	4,500	6,080	7,320	8,220	
5	5,660	7,680	9,220	10,360	
6	7,900	10,320	12,060	12,500	
Freeway Adjustments					
Auxiliary Lane			Ramp Metering		
+ 1,000			+ 5%		

UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	B	C	D	E
1	Undivided	420	840	1,190	1,640
2	Divided	1,810	2,560	3,240	3,590
3	Divided	2,720	3,840	4,860	5,380
Uninterrupted Flow Highway Adjustments					
Lanes	Median	Exclusive left lanes	Adjustment factors		
1	Divided	Yes	+5%		
Multi	Undivided	Yes	-5%		
Multi	Undivided	No	-25%		

**BICYCLE MODE<sup>2</sup>**  
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	150	390	1,000
50-84%	110	340	1,000	>1,000
85-100%	470	1,000	>1,000	**

**PEDESTRIAN MODE<sup>2</sup>**  
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	140	480
50-84%	*	80	440	800
85-100%	200	540	880	>1,000

**BUS MODE (Scheduled Fixed Route)<sup>3</sup>**  
(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

<sup>1</sup>Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

<sup>2</sup> Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

<sup>3</sup> Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

\* Cannot be achieved using table input value defaults.

\*\* Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:  
Florida Department of Transportation  
Systems Planning Office  
[www.dot.state.fl.us/planning/systems/sm/los/default.shtm](http://www.dot.state.fl.us/planning/systems/sm/los/default.shtm)

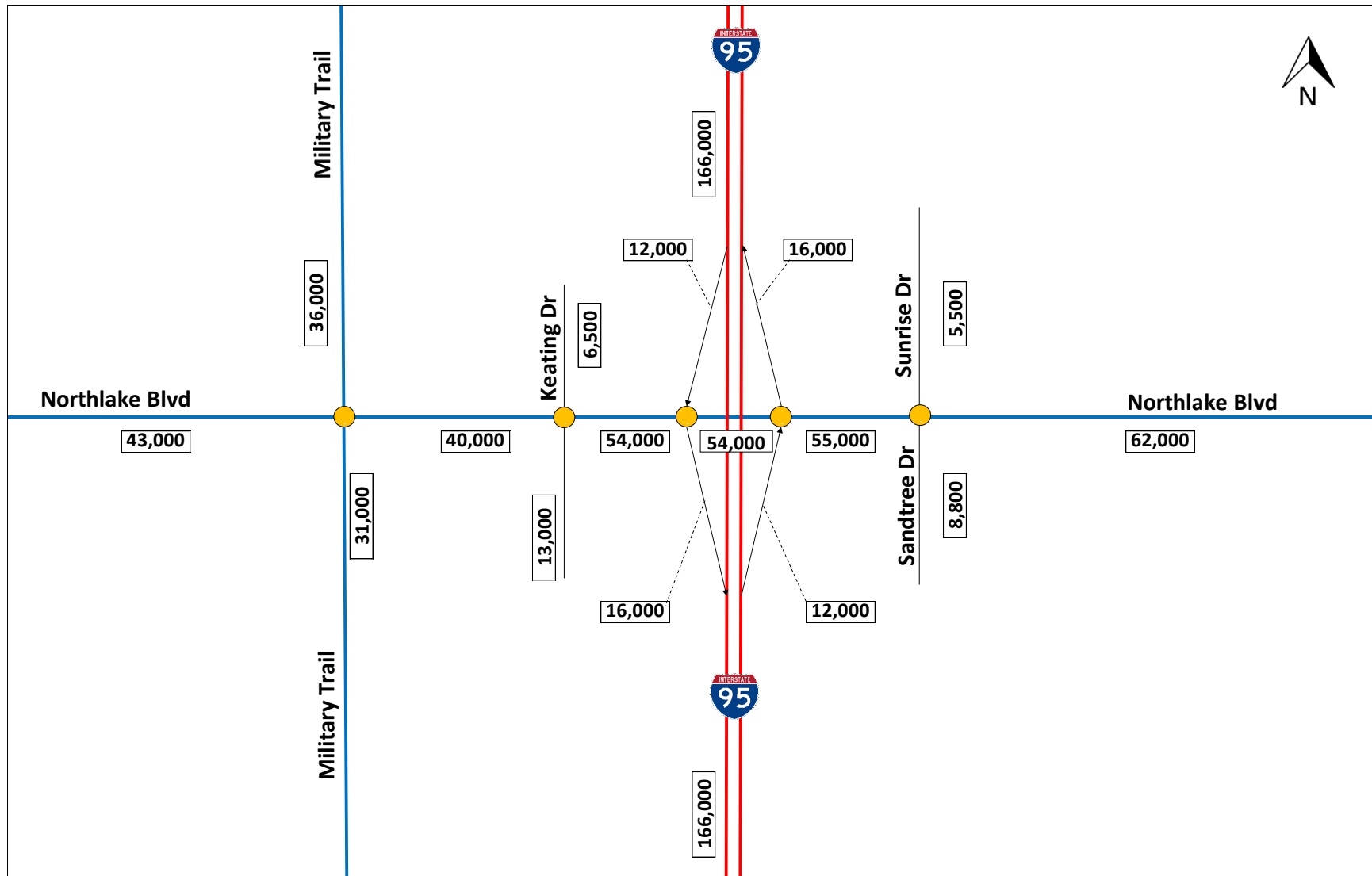
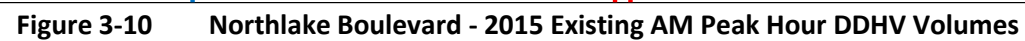


Figure 3-7 Northlake Boulevard - 2015 Existing AADT Volumes



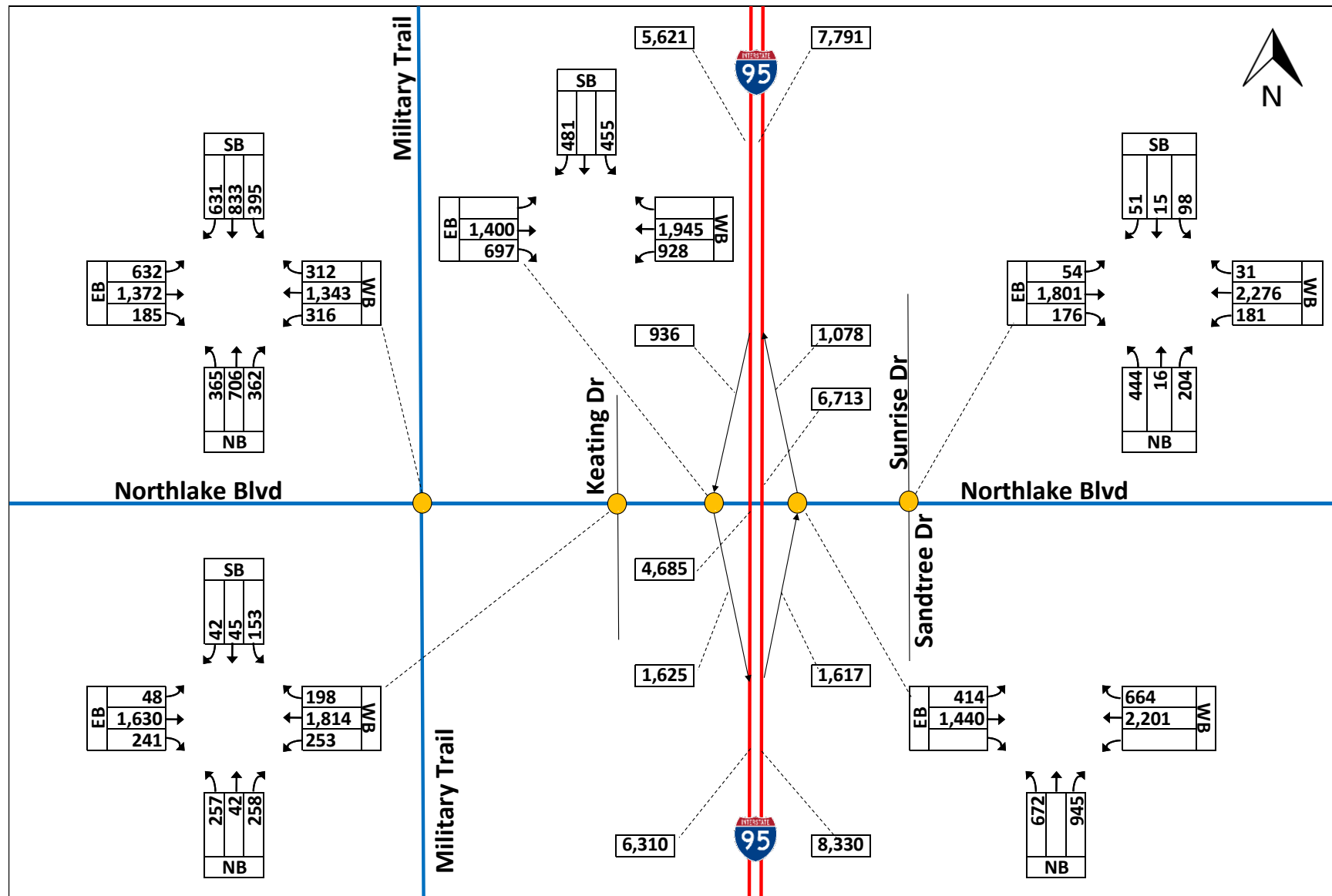


Figure 3-13 Northlake Boulevard - 2015 Existing PM Peak Hour DDHV Volumes

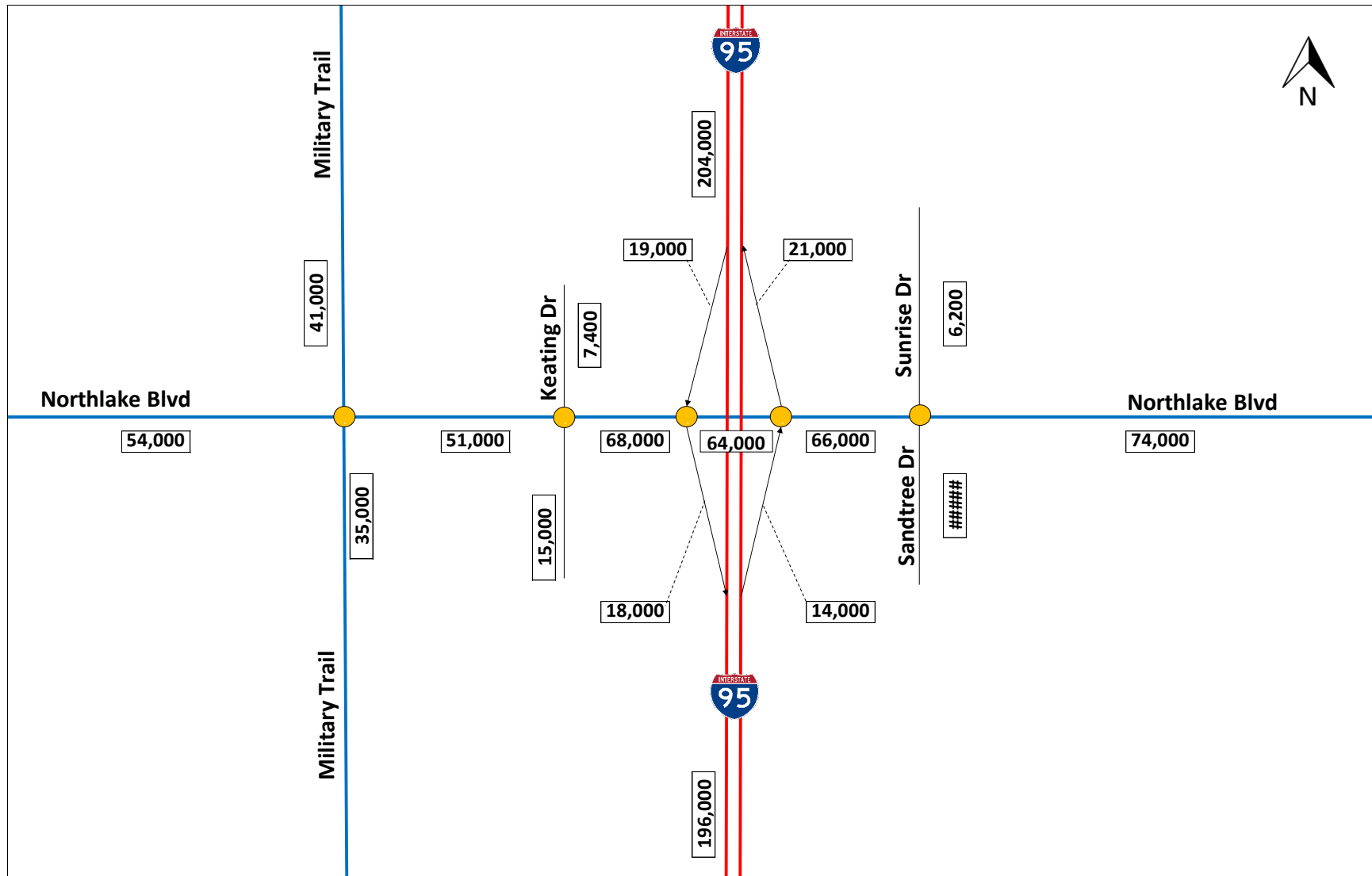
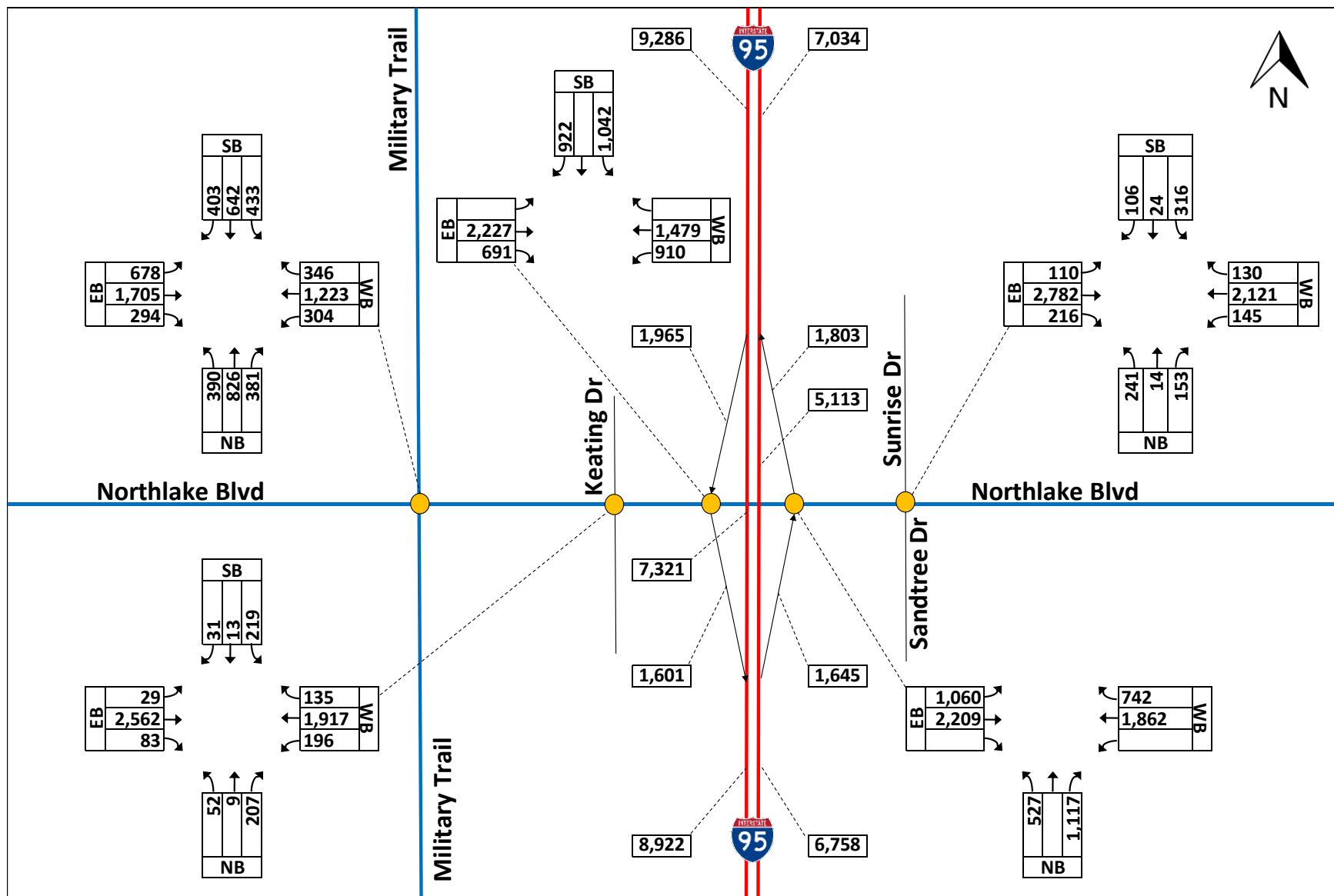


Figure 4-5 Northlake Boulevard - 2040 Future AADT Volumes



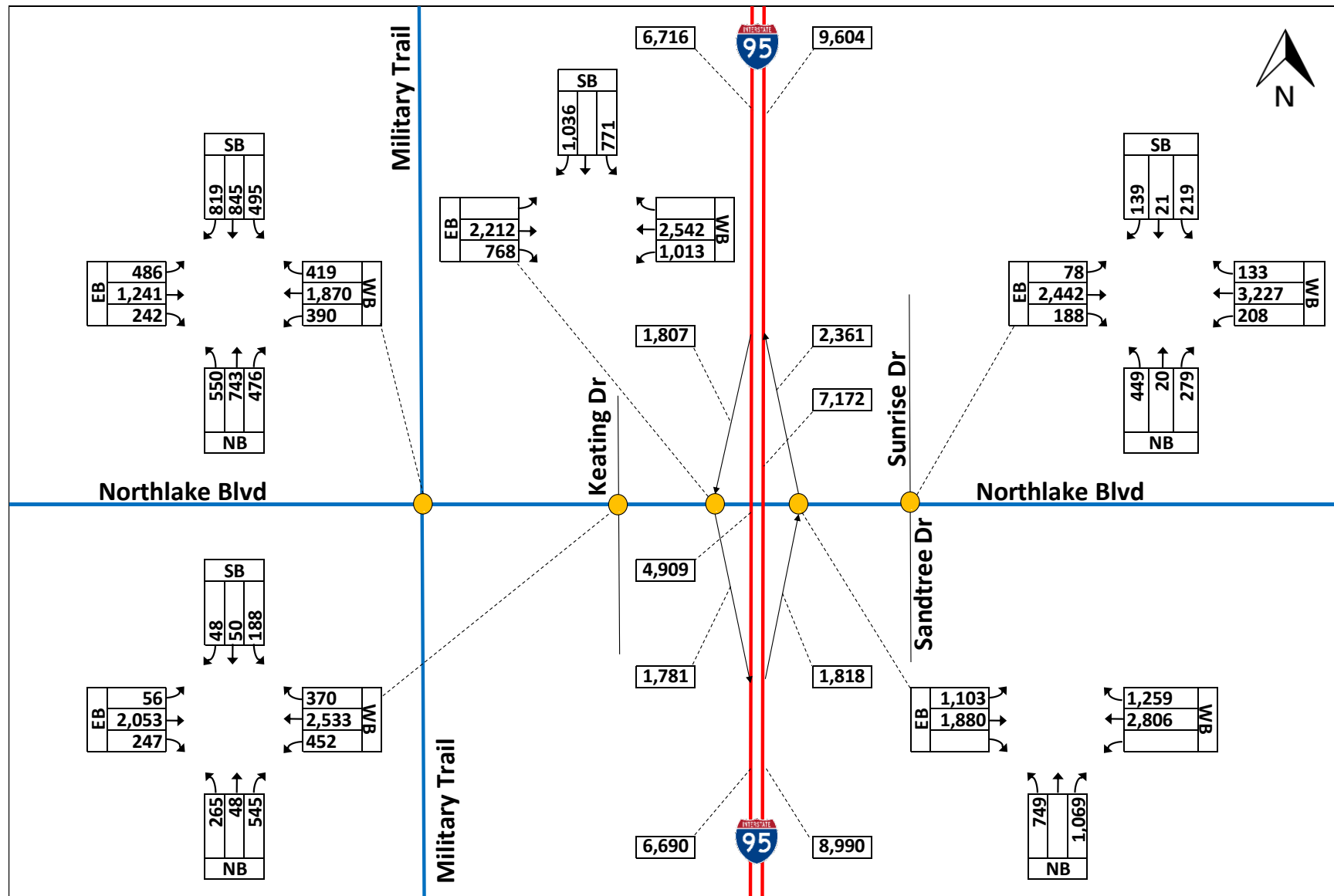


Figure 4-17 Northlake Boulevard - 2040 PM Peak Hour Future DDHV Volumes

Florida Department of Transportation  
Annual Vehicle Classification Report - Report Type: ALL  
Count Year 2014

County: 93 - PALM BEACH

Site Co Sec Sub MilePost Description  
2203 93220000 26.764 SR 9/I-95 - N OF BELVEDERE RD (COUNTY LINK: 3210)  
Func. Class: 11 - Urban Principal Arterial -- Interstate  
Survey Type: Portable Duration: 1 Days

Class	Description	Annual Average Daily		Summary Daily Statistics	
		Volume	%	Daily	Design Hour
01	MOTORCYCLES	461	0.22	24T&B = 5.99%	DHT = 3.00%
02	CARS	168800	82.14	24T = 5.64%	
03	PICK-UPS AND VANS	23731	11.55	24H = 3.88%	DH3 = 1.94%
04	BUSES	715	0.35	24M = 2.11%	DH2 = 1.06%
05	2-AXLE, SINGLE UNIT TRUCKS	3622	1.76		
06	3-AXLE, SINGLE UNIT TRUCKS	1051	0.51		
07	4-AXLE, SINGLE UNIT TRUCKS	113	0.06		
08	2-AXL TRCTR W/ 1 OR 2-AXL TRLR, 3-AXL TRCTR W/ 1-A	2644	1.29		
09	3-AXLE TRACTOR W/ 2-AXLE TRLR	3312	1.61		
10	3-AXLE TRACTOR W/ 3-AXLE TRLR	575	0.28		
11	5-AXLE MULTI-TRLR	47	0.02		
12	6-AXLE MULTI-TRLR	18	0.01		
13	ANY 7 OR MORE AXLE	215	0.10		
14	NOT USED	0	0.00		
15	OTHER	196	0.10		
		-----	-----		
		#####	100.00		

Site Co Sec Sub MilePost Description  
2214 93220000 38.120 SR 9/I-95 - N OF MILITARY TRL & PGA BLVD (COUNTY L  
Func. Class: 11 - Urban Principal Arterial -- Interstate  
Survey Type: Portable Duration: 1 Days

Class	Description	Annual Average Daily		Summary Daily Statistics	
		Volume	%	Daily	Design Hour
01	MOTORCYCLES	212	0.19	24T&B = 8.15%	DHT = 4.08%
02	CARS	86343	76.07	24T = 7.84%	
03	PICK-UPS AND VANS	16795	14.80	24H = 5.63%	DH3 = 2.82%
04	BUSES	349	0.31	24M = 2.52%	DH2 = 1.26%
05	2-AXLE, SINGLE UNIT TRUCKS	2507	2.21		
06	3-AXLE, SINGLE UNIT TRUCKS	420	0.37		
07	4-AXLE, SINGLE UNIT TRUCKS	148	0.13		
08	2-AXL TRCTR W/ 1 OR 2-AXL TRLR, 3-AXL TRCTR W/ 1-A	1971	1.74		
09	3-AXLE TRACTOR W/ 2-AXLE TRLR	3633	3.20		
10	3-AXLE TRACTOR W/ 3-AXLE TRLR	46	0.04		
11	5-AXLE MULTI-TRLR	106	0.09		
12	6-AXLE MULTI-TRLR	68	0.06		
13	ANY 7 OR MORE AXLE	3	0.00		
14	NOT USED	0	0.00		
15	OTHER	900	0.79		
		-----	-----		
		#####	100.00		

Classes: Passenger Vehicles 01-03, Truck & Buses 04-13, Trucks 05-13, Medium Trucks 04-05, Heavy Trucks 06-13

Florida Department of Transportation  
Annual Vehicle Classification Report - Report Type: ALL  
Count Year 2014

County: 93 - PALM BEACH

Site Co Sec Sub MilePost Description  
5405 93012000 0.510 SR 708/BLUE HERON BLVD - W OF SR 9/I-95 (COUNTY LI  
Func. Class: 14 - Urban Other Principal Arterial  
Survey Type: Portable Duration: 1 Days

	Annual Average Daily		Summary Daily Statistics	
	Volume	%	Daily	Design Hour
Class 01 MOTORCYCLES	108	0.31	24T&B = 7.66%	DHT = 3.83%
Class 02 CARS	25920	75.13	24T = 6.57%	
Class 03 PICK-UPS AND VANS	5829	16.90	24H = 3.04%	DH3 = 1.52%
Class 04 BUSES	376	1.09	24M = 4.62%	DH2 = 2.31%
Class 05 2-AXLE, SINGLE UNIT TRUCKS	1218	3.53		
Class 06 3-AXLE, SINGLE UNIT TRUCKS	165	0.48		
Class 07 4-AXLE, SINGLE UNIT TRUCKS	11	0.03		
Class 08 2-AXL TRCTR W/ 1 OR 2-AXL TRLR, 3-AXL TRCTR W/ 1-A	237	0.69		
Class 09 3-AXLE TRACTOR W/ 2-AXLE TRLR	615	1.78		
Class 10 3-AXLE TRACTOR W/ 3-AXLE TRLR	2	0.01		
Class 11 5-AXLE MULTI-TRLR	10	0.03		
Class 12 6-AXLE MULTI-TRLR	7	0.02		
Class 13 ANY 7 OR MORE AXLE	2	0.01		
Class 14 NOT USED	0	0.00		
Class 15 OTHER	0	0.00		
	-----	-----		
	34500	100.01		

Site Co Sec Sub MilePost Description  
5406 93012000 1.132 SR 708/BLUE HERON BLVD - E OF SR 9/I-95 (COUNTY LI  
Func. Class: 14 - Urban Other Principal Arterial  
Survey Type: Portable Duration: 2 Days

	Annual Average Daily		Summary Daily Statistics	
	Volume	%	Daily	Design Hour
Class 01 MOTORCYCLES	183	0.39	24T&B = 5.42%	DHT = 2.71%
Class 02 CARS	38768	83.37	24T = 4.45%	
Class 03 PICK-UPS AND VANS	4953	10.65	24H = 1.87%	DH3 = 0.93%
Class 04 BUSES	453	0.97	24M = 3.56%	DH2 = 1.78%
Class 05 2-AXLE, SINGLE UNIT TRUCKS	1202	2.59		
Class 06 3-AXLE, SINGLE UNIT TRUCKS	124	0.27		
Class 07 4-AXLE, SINGLE UNIT TRUCKS	18	0.04		
Class 08 2-AXL TRCTR W/ 1 OR 2-AXL TRLR, 3-AXL TRCTR W/ 1-A	250	0.54		
Class 09 3-AXLE TRACTOR W/ 2-AXLE TRLR	405	0.87		
Class 10 3-AXLE TRACTOR W/ 3-AXLE TRLR	8	0.02		
Class 11 5-AXLE MULTI-TRLR	36	0.08		
Class 12 6-AXLE MULTI-TRLR	17	0.04		
Class 13 ANY 7 OR MORE AXLE	10	0.02		
Class 14 NOT USED	0	0.00		
Class 15 OTHER	74	0.16		
	-----	-----		
	46501	100.01		

Classes: Passenger Vehicles 01-03, Truck & Buses 04-13, Trucks 05-13, Medium Trucks 04-05, Heavy Trucks 06-13

County: 93  
 Station: 3231  
 Description: I-95 SB OFF RAMP TO NORTHLAKE BLVD  
 Start Date: 03/24/2015  
 Start Time: 0000

Direction: S					
Time	1st	2nd	3rd	4th	Total
0000	41	38	37	11	127
0100	15	19	10	11	55
0200	9	10	15	22	56
0300	9	10	12	9	40
0400	9	12	13	20	54
0500	19	24	35	56	134
0600	49	86	108	141	384
0700	149	177	174	295	795
0800	226	232	195	229	882
0900	162	177	187	185	711
1000	155	186	194	200	735
1100	161	169	216	220	766
1200	194	206	211	196	807
1300	202	189	183	212	786
1400	238	215	238	219	910
1500	208	272	162	185	827
1600	216	257	232	233	938
1700	260	239	195	223	917
1800	201	197	201	213	812
1900	172	140	144	131	587
2000	130	118	104	114	466
2100	114	109	82	72	377
2200	80	63	56	51	250
2300	41	46	34	22	143

24-Hour Totals: 12559

Peak Volume Information

	Hour	Volume
A.M.	745	948
P.M.	1615	982
Daily	1615	982

Truck Percentage 4.32 NaN 4.32

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
S	41	10157	1818	42	257	79	43	74	45	1	2	0	0	0	0	543	12559

Generated by SPS 5.0.45P

County: 93  
 Station: 3231  
 Description: I-95 SB OFF RAMP TO NORTHLAKE BLVD  
 Start Date: 03/25/2015  
 Start Time: 0000

Direction: S					
Time	1st	2nd	3rd	4th	Total
0000	18	20	18	17	73
0100	16	11	9	6	42
0200	6	2	8	7	23
0300	4	8	7	12	31
0400	6	5	17	22	50
0500	15	24	33	48	120
0600	57	94	98	136	385
0700	143	187	189	234	753
0800	217	215	199	228	859
0900	210	194	191	195	790
1000	171	186	198	252	807
1100	178	187	187	231	783
1200	204	185	228	194	811
1300	206	228	192	245	871
1400	216	204	224	197	841
1500	221	212	205	243	881
1600	216	221	231	245	913
1700	225	249	213	205	892
1800	215	217	200	218	850
1900	180	179	142	131	632
2000	154	124	122	113	513
2100	109	100	85	87	381
2200	84	51	72	59	266
2300	60	49	38	32	179

24-Hour Totals: 12746

Peak Volume Information

	Hour	Volume
A.M.	745	865
P.M.	1630	950
Daily	1630	950

Truck Percentage 4.38 NaN 4.38

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
S	54	104	11	1723	38	214	130	32	76	64	4	0	0	0	0	558	12746

Generated by SPS 5.0.45P

County: 93  
 Station: 3231  
 Description: I-95 SB OFF RAMP TO NORTHLAKE BLVD  
 Start Date: 03/26/2015  
 Start Time: 0000

Direction: S					
Time	1st	2nd	3rd	4th	Total
0000	27	28	20	9	84
0100	14	12	15	8	49
0200	8	5	5	7	25
0300	7	7	9	12	35
0400	2	11	13	16	42
0500	15	29	29	43	116
0600	64	87	114	117	382
0700	143	154	189	236	722
0800	225	213	191	254	883
0900	205	175	204	188	772
1000	212	200	191	200	803
1100	193	205	198	215	811
1200	239	217	193	210	859
1300	189	214	205	212	820
1400	233	208	227	219	887
1500	237	246	198	228	909
1600	186	220	202	210	818
1700	254	255	220	237	966
1800	204	216	170	184	774
1900	160	144	154	120	578
2000	127	154	118	115	514
2100	101	133	85	79	398
2200	87	65	61	67	280
2300	58	59	50	51	218

24-Hour Totals: 12745

Peak Volume Information

	Hour	Volume
A.M.	800	883
P.M.	1700	966
Daily	1700	966

Truck Percentage 4.56 NaN 4.56

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
S	57	10429	1678	40	198	153	47	78	57	7	0	1	0	0	0	581	12745

Generated by SPS 5.0.45P

County: 93  
 Station: 3235  
 Description: I-95 SB ON RAMP FROM NORTHLAKE BLVD  
 Start Date: 03/24/2015  
 Start Time: 0000

Direction: S					
Time	1st	2nd	3rd	4th	Total
0000	37	37	27	21	122
0100	20	17	18	14	69
0200	14	11	10	15	50
0300	13	14	12	16	55
0400	12	15	22	38	87
0500	27	59	58	87	231
0600	102	143	184	245	674
0700	291	339	353	383	1366
0800	346	320	316	260	1242
0900	236	241	262	234	973
1000	203	217	260	243	923
1100	241	217	252	250	960
1200	233	283	276	266	1058
1300	310	270	255	291	1126
1400	279	261	302	277	1119
1500	284	291	322	279	1176
1600	299	332	302	336	1269
1700	377	372	380	328	1457
1800	331	260	233	228	1052
1900	232	212	214	177	835
2000	184	170	170	163	687
2100	154	125	111	99	489
2200	102	97	81	70	350
2300	54	32	42	41	169
24-Hour Totals:					17539

Peak Volume Information

	Hour	Volume
A.M.	715	1421
P.M.	1645	1465
Daily	1645	1465

Truck Percentage 6.01 NaN 6.01

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
S	47	13064	3374	54	424	250	121	109	77	17	2	0	0	0	0	1054	17539

Generated by SPS 5.0.45P

Direction: S					
Time	1st	2nd	3rd	4th	Total
0000	38	35	15	20	108
0100	15	14	14	13	56
0200	14	18	9	9	50
0300	10	13	14	9	46
0400	17	26	29	29	101
0500	30	52	56	75	213
0600	79	138	150	160	527
0700	232	270	297	312	1111
0800	316	256	295	256	1123
0900	220	208	230	242	900
1000	224	260	228	201	913
1100	231	251	235	248	965
1200	249	265	259	254	1027
1300	282	260	257	245	1044
1400	238	284	281	269	1072
1500	281	276	282	272	1111
1600	275	320	304	317	1216
1700	343	333	323	298	1297
1800	323	280	248	232	1083
1900	223	191	188	187	789
2000	168	149	162	148	627
2100	135	130	120	108	493
2200	128	98	85	72	383
2300	63	39	42	43	187
24-Hour Totals:					16442

	Hour	Volume
A.M.	715	1195
P.M.	1645	1316
Daily	1645	1316

Classification Summary Database

Generated by SPS 5.0.45P

County: 93  
 Station: 3235  
 Description: I-95 SB ON RAMP FROM NORTHLAKE BLVD  
 Start Date: 03/26/2015  
 Start Time: 0000

Direction: S					
Time	1st	2nd	3rd	4th	Total
0000	37	30	30	20	117
0100	16	21	7	15	59
0200	8	17	17	8	50
0300	5	10	14	13	42
0400	15	25	21	28	89
0500	31	54	65	68	218
0600	80	136	167	149	532
0700	234	278	332	289	1133
0800	292	237	269	227	1025
0900	246	223	215	208	892
1000	218	247	259	236	960
1100	261	254	265	254	1034
1200	227	272	248	264	1011
1300	288	258	256	253	1055
1400	253	281	324	260	1118
1500	277	313	296	259	1145
1600	275	338	307	279	1199
1700	346	366	309	320	1341
1800	318	308	234	238	1098
1900	197	216	190	208	811
2000	163	157	140	148	608
2100	144	132	121	92	489
2200	92	101	87	81	361
2300	67	66	63	53	249
24-Hour Totals:					16636

Peak Volume Information

	Hour	Volume
A.M.	715	1191
P.M.	1700	1341
Daily	1700	1341

Truck Percentage 6.55 NaN 6.55

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
S	83	12367	3096	41	299	431	83	73	111	49	0	3	0	0	0	1090	16636

Generated by SPS 5.0.45P

County: 93  
 Station: 3241  
 Description: I-95 NB ON RAMP FROM NORTHLAKE BLVD  
 Start Date: 03/24/2015  
 Start Time: 0000

Direction: N					
Time	1st	2nd	3rd	4th	Total
0000	40	42	41	26	149
0100	34	22	19	21	96
0200	24	18	16	16	74
0300	8	14	12	13	47
0400	8	14	18	16	56
0500	17	25	43	50	135
0600	47	51	82	151	331
0700	101	166	153	389	809
0800	330	390	339	345	1404
0900	266	268	259	255	1048
1000	245	238	251	276	1010
1100	260	265	260	317	1102
1200	303	287	297	321	1208
1300	295	295	297	328	1215
1400	279	328	322	371	1300
1500	325	348	346	409	1428
1600	402	430	380	436	1648
1700	427	467	364	375	1633
1800	293	366	310	278	1247
1900	242	188	194	175	799
2000	166	143	130	105	544
2100	99	115	94	105	413
2200	86	66	88	53	293
2300	61	44	38	45	188

24-Hour Totals: 18177

Peak Volume Information

	Hour	Volume
A.M.	745	1448
P.M.	1630	1710
Daily	1630	1710

Truck Percentage 6.77 NaN 6.77

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
N	106	146	16	22	24	44	295	711	57	39	51	34	0	0	0	0	1231 18177

Generated by SPS 5.0.45P

County: 93  
 Station: 3241  
 Description: I-95 NB ON RAMP FROM NORTHLAKE BLVD  
 Start Date: 03/25/2015  
 Start Time: 0000

Direction: N					
Time	1st	2nd	3rd	4th	Total
0000	40	41	21	21	123
0100	19	19	14	9	61
0200	15	19	6	11	51
0300	10	14	11	9	44
0400	11	7	13	22	53
0500	23	23	35	73	154
0600	42	71	69	114	296
0700	148	181	214	217	760
0800	224	321	266	198	1009
0900	181	161	163	232	737
1000	190	208	229	295	922
1100	268	320	306	281	1175
1200	314	299	353	319	1285
1300	280	265	287	357	1189
1400	290	321	333	333	1277
1500	284	325	391	393	1393
1600	380	360	366	373	1479
1700	404	418	450	348	1620
1800	368	290	261	195	1114
1900	190	203	162	202	757
2000	155	145	130	113	543
2100	113	118	118	93	442
2200	89	75	78	70	312
2300	68	54	48	45	215

24-Hour Totals: 17011

Peak Volume Information

	Hour	Volume
A.M.	745	1028
P.M.	1645	1645
Daily	1645	1645

Truck Percentage 7.07 NaN 7.07

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
N	136	13776	1896	33	264	726	41	36	47	50	0	6	0	0	0	1203	17011

Generated by SPS 5.0.45P

County: 93  
 Station: 3241  
 Description: I-95 NB ON RAMP FROM NORTHLAKE BLVD  
 Start Date: 03/26/2015  
 Start Time: 0000

Direction: N					
Time	1st	2nd	3rd	4th	Total
0000	32	33	20	25	110
0100	20	15	6	19	60
0200	10	12	12	7	41
0300	5	9	6	8	28
0400	11	11	15	13	50
0500	21	20	31	55	127
0600	53	67	63	111	294
0700	142	159	185	222	708
0800	226	267	245	242	980
0900	166	176	180	177	699
1000	175	207	231	208	821
1100	225	223	244	257	949
1200	245	296	327	320	1188
1300	296	269	284	312	1161
1400	305	302	316	333	1256
1500	358	308	361	351	1378
1600	337	381	387	381	1486
1700	380	381	317	317	1395
1800	292	263	206	231	992
1900	193	222	157	179	751
2000	140	139	152	128	559
2100	124	116	100	86	426
2200	93	89	101	68	351
2300	84	59	52	56	251
24-Hour Totals:					16061

Peak Volume Information

	Hour	Volume
A.M.	800	980
P.M.	1615	1529
Daily	1615	1529

Truck Percentage 7.31 NaN 7.31

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
N	207	128	14	1866	38	258	705	51	20	37	55	0	10	0	0	1174	16061

Generated by SPS 5.0.45P

County: 93  
 Station: 3245  
 Description: I-95 NB OFF RAMP TO NORTHLAKE BLVD  
 Start Date: 03/24/2015  
 Start Time: 0000

Direction: N					
Time	1st	2nd	3rd	4th	Total
0000	19	25	17	15	76
0100	11	14	15	7	47
0200	8	8	13	4	33
0300	9	8	5	8	30
0400	7	9	11	30	57
0500	17	24	38	47	126
0600	54	73	117	125	369
0700	148	208	250	226	832
0800	189	235	248	222	894
0900	183	189	186	190	748
1000	191	181	204	227	803
1100	190	208	242	232	872
1200	229	232	227	217	905
1300	235	220	231	223	909
1400	233	220	224	231	908
1500	244	231	297	298	1070
1600	279	251	257	301	1088
1700	304	280	271	286	1141
1800	266	233	205	212	916
1900	171	185	169	144	669
2000	125	118	119	107	469
2100	124	98	84	64	370
2200	60	56	45	34	195
2300	35	27	28	21	111
24-Hour Totals:					13638

Peak Volume Information

	Hour	Volume
A.M.	730	900
P.M.	1645	1156
Daily	1645	1156

Truck Percentage 7.37 NaN 7.37

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
N	19	8744	3870	70	723	35	42	72	62	1	0	0	0	0	0	1005	13638

Generated by SPS 5.0.45P

County: 93  
 Station: 3245  
 Description: I-95 NB OFF RAMP TO NORTHLAKE BLVD  
 Start Date: 03/25/2015  
 Start Time: 0000

Direction: N					
Time	1st	2nd	3rd	4th	Total
0000	23	13	15	7	58
0100	9	11	7	7	34
0200	5	10	6	11	32
0300	4	8	6	7	25
0400	9	6	16	23	54
0500	29	23	41	47	140
0600	59	71	122	146	398
0700	173	207	280	251	911
0800	234	272	231	217	954
0900	191	154	134	167	646
1000	134	183	230	186	733
1100	198	230	228	233	889
1200	230	242	246	210	928
1300	232	215	232	234	913
1400	191	232	202	253	878
1500	231	249	291	265	1036
1600	277	273	286	308	1144
1700	305	293	285	257	1140
1800	242	264	235	190	931
1900	185	189	168	163	705
2000	170	145	125	126	566
2100	148	117	85	66	416
2200	57	47	40	39	183
2300	32	26	21	27	106

24-Hour Totals: 13820

Peak Volume Information

	Hour	Volume
A.M.	730	1037
P.M.	1630	1192
Daily	1630	1192

Truck Percentage 6.58 NaN 6.58

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
N	22	8975	3914	46	706	10	16	87	43	1	0	0	0	0	0	909	13820

Generated by SPS 5.0.45P

County: 93  
 Station: 3245  
 Description: I-95 NB OFF RAMP TO NORTHLAKE BLVD  
 Start Date: 03/26/2015  
 Start Time: 0000

Direction: N					
Time	1st	2nd	3rd	4th	Total
0000	12	12	17	12	53
0100	11	6	10	11	38
0200	9	8	13	2	32
0300	8	6	8	6	28
0400	7	5	11	19	42
0500	22	11	37	43	113
0600	57	89	121	125	392
0700	157	238	258	223	876
0800	236	279	241	227	983
0900	184	162	166	199	711
1000	161	172	214	196	743
1100	207	227	197	214	845
1200	189	241	226	273	929
1300	220	209	249	218	896
1400	222	221	207	217	867
1500	230	268	275	278	1051
1600	292	271	276	300	1139
1700	308	293	306	255	1162
1800	214	207	224	159	804
1900	173	155	153	143	624
2000	128	129	106	93	456
2100	115	83	87	79	364
2200	75	62	36	39	212
2300	39	30	26	24	119
24-Hour Totals:					13479

Peak Volume Information

	Hour	Volume
A.M.	730	996
P.M.	1645	1207
Daily	1645	1207

Truck Percentage 7.62 NaN 7.62

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
N	16	8433	4003	60	725	57	26	93	66	0	0	0	0	0	0	1027	13479

Generated by SPS 5.0.45P

## Appendix B

### Field Monitoring





## NOISE MEASUREMENT DATA SHEET

Measurements Taken By: Brian Cummings Date: Oct 25, 2016

Time Study Started: 7:11 am - 7:21 am, 7:22 am - 7:32 am, 7:33 am - 7:43 am Time Study Ended: 7:43 am

Project Identification: 25971 - Northlake Blvd. PD&E Study

Site Identification: Site # 1

Garden Lodge No. 3666 F. & A. M.

9463 ROAN LANE - Palm Beach Gardens, FL 33403

**Weather Conditions:**

Sky: Clear \_\_\_\_\_ Partly Cloudy \_\_\_\_\_ Cloudy ☒ \_\_\_\_\_ Other \_\_\_\_\_

Temperature: 75° Wind Speed 2-4 mph Wind Direction W-NW Humidity 68.2

**Equipment:**

**Sound Level Meter:**

Type: Quest Sound Pro 2 Serial Number: BII090019

Did you check the battery? Yes ✓ No       

Calibration Reading: Start 114.0 End 114.0

Response Settings: Fast ☒ Slow ☐

Weighting: A ✓ Other (identify) \_\_\_\_\_

Calibrator:

Type: Quest QC-10 114db-1000Hz Serial Number: QII090102

Did you check the battery? Yes ✓ No       

Data File Numbers: \_\_\_\_\_

# RESULTS

LMAX \_\_\_\_\_ LEQ ✓ L10 \_\_\_\_\_ L50 \_\_\_\_\_ L90 \_\_\_\_\_ L95 \_\_\_\_\_ Other \_\_\_\_\_

Background Noise: 3 min into run<sup>1</sup> train whistle, 7 min into run<sup>1</sup> bird chatter

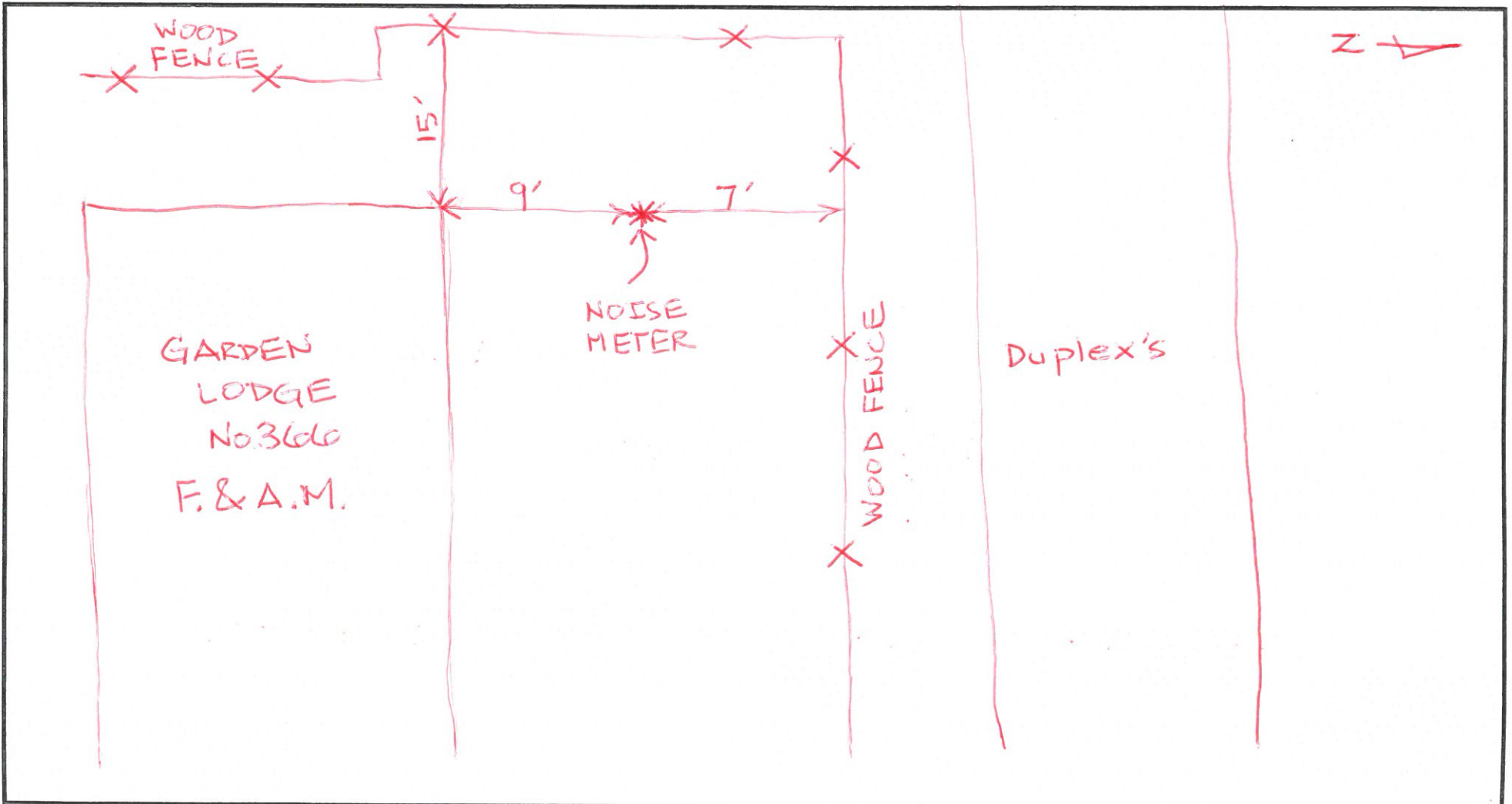
Major Sources: Train, birds, I-95

Unusual Events: \_\_\_\_\_

Other Notes: Actual speeds clocked: I-95 NB 70mph, I-95 SB 73MPH Northlake → 65 → I-95  
Posted Speed Limit 45 MPH

Picture 1 Looking N Picture 2 Looking S Picture 3 Looking E Picture 4 Looking W

## SKETCH



## NOISE MEASUREMENT DATA SHEET

Measurements Taken By: Brian Cummings Date: Oct. 25, 2016

Time Study Started: 7:55am-8:05, 8:05am-8:15am, 8:15am-8:25am Time Study Ended: 8:25 AM

Project Identification: 25971 - Northlake Blvd. PD&E Study

Site Identification: Site #2

Covenant Centre International / Gardens School of Technology Arts  
9153 Roan Lane Palm Beach Gardens, FL 33403

### Weather Conditions:

Sky: Clear \_\_\_\_\_ Partly Cloudy \_\_\_\_\_ Cloudy ☒ \_\_\_\_\_ Other \_\_\_\_\_

Temperature: 75° Wind Speed 1-3 mph Wind Direction W-NW Humidity 69.3

**Equipment:**

**Sound Level Meter:**

Type: Quest Sound Pro 2 Serial Number: BII090019

Did you check the battery? Yes ☒ No ☐

Calibration Reading: Start 114.0 End 114.0

Response Settings: Fast ☒ Slow ☐

Weighting: A ✓ Other (identify) \_\_\_\_\_

Calibrator:

Type: Quest QC-10 114db-1000Hz Serial Number: QII090102

Did you check the battery? Yes ✓ No       

**Data File Numbers:** \_\_\_\_\_

## RESULTS

LMAX \_\_\_\_\_ LEQ ✓ L10 \_\_\_\_\_ L50 \_\_\_\_\_ L90 \_\_\_\_\_ L95 \_\_\_\_\_ Other \_\_\_\_\_

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

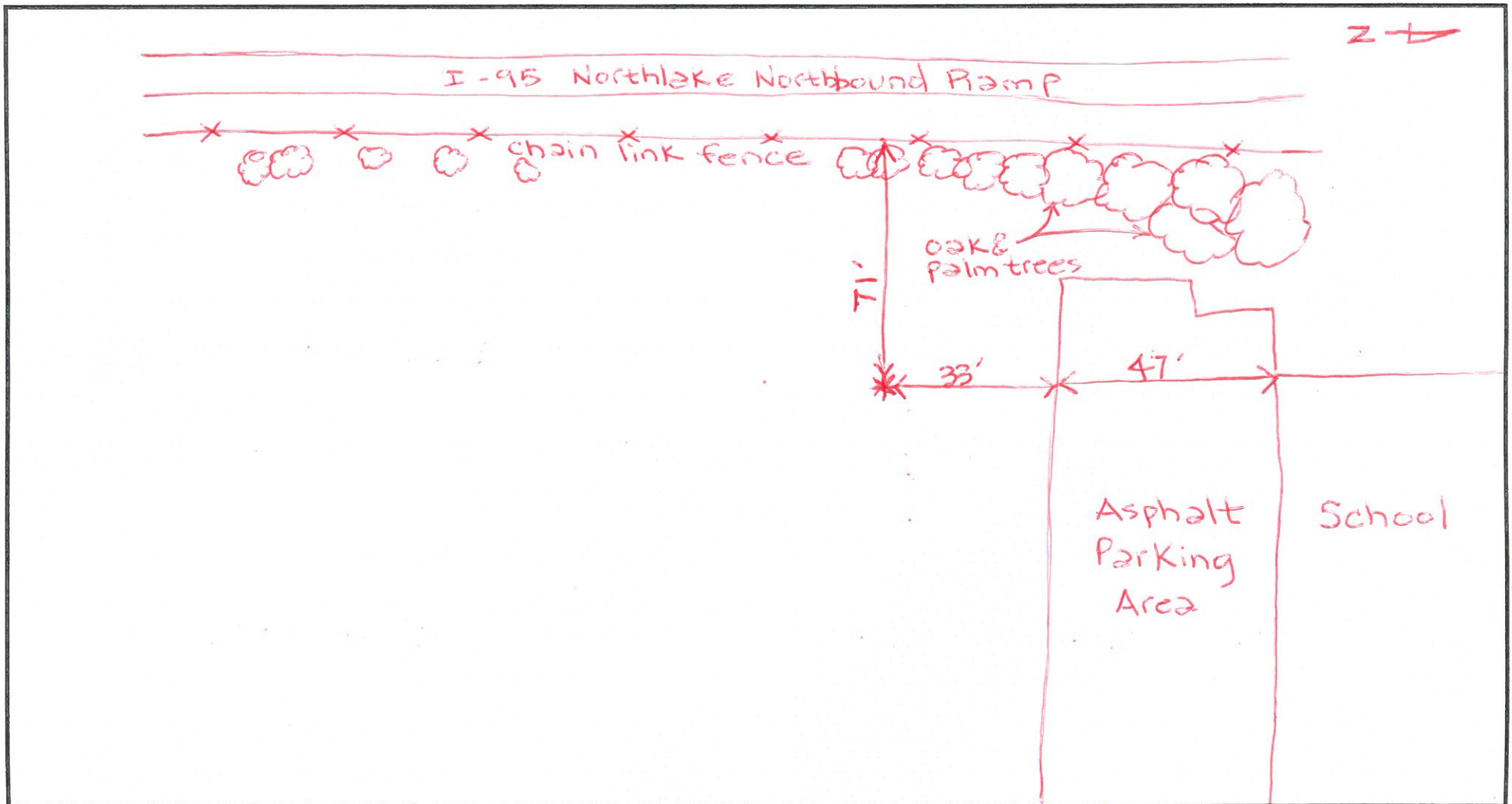
Major Sources: I-95

Unusual Events: \_\_\_\_\_

Other Notes: Actual Clocked Speeds: I-95 NB 70 MPH, I-95 SB 73 MPH  
Northlake WB 35 MPH, EB 25 MPH Northlake 65 → I-95  
Posted Speed Limit 45 MPH

Picture 5 Looking N Picture 6 Looking S Picture 7 Looking E Picture 8 Looking W

## SKETCH



## NOISE MEASUREMENT DATA SHEET

Measurements Taken By: Brian Cummings Date: Oct 25, 2016

Time Study Started: 8:31am-8:47am, 8:47am-8:57am, 8:57-9:07am Time Study Ended: 9:07AM

Project Identification: 25971- Northlake Blvd. PD&E Study

Site Identification: Site #3

## Sandtree (Playground)

Near 516 Sandtree Drive Palm Beach Gardens, FL 33403

**Weather Conditions:**

Sky: Clear \_\_\_\_\_ Partly Cloudy ✓ Cloudy \_\_\_\_\_ Other \_\_\_\_\_

Temperature: 76° Wind Speed 1-3 mph Wind Direction W-NW Humidity 69.8

**Equipment:**

**Sound Level Meter:**

Type: Quest Sound Pro 2 Serial Number: BII090019

Did you check the battery? Yes ✓ No       

Calibration Reading: Start 114.0 End 114.0

Response Settings: Fast ☒ Slow ☐

Weighting: A ✓ Other (identify) \_\_\_\_\_

Calibrator:

Type: Quest QC-10 114db-1000Hz Serial Number: QII090102

Did you check the battery? Yes ☒ No ☐

**Data File Numbers:** \_\_\_\_\_

# RESULTS

LMAX \_\_\_\_\_ LEQ ✓ L10 \_\_\_\_\_ L50 \_\_\_\_\_ L90 \_\_\_\_\_ L95 \_\_\_\_\_ Other \_\_\_\_\_

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

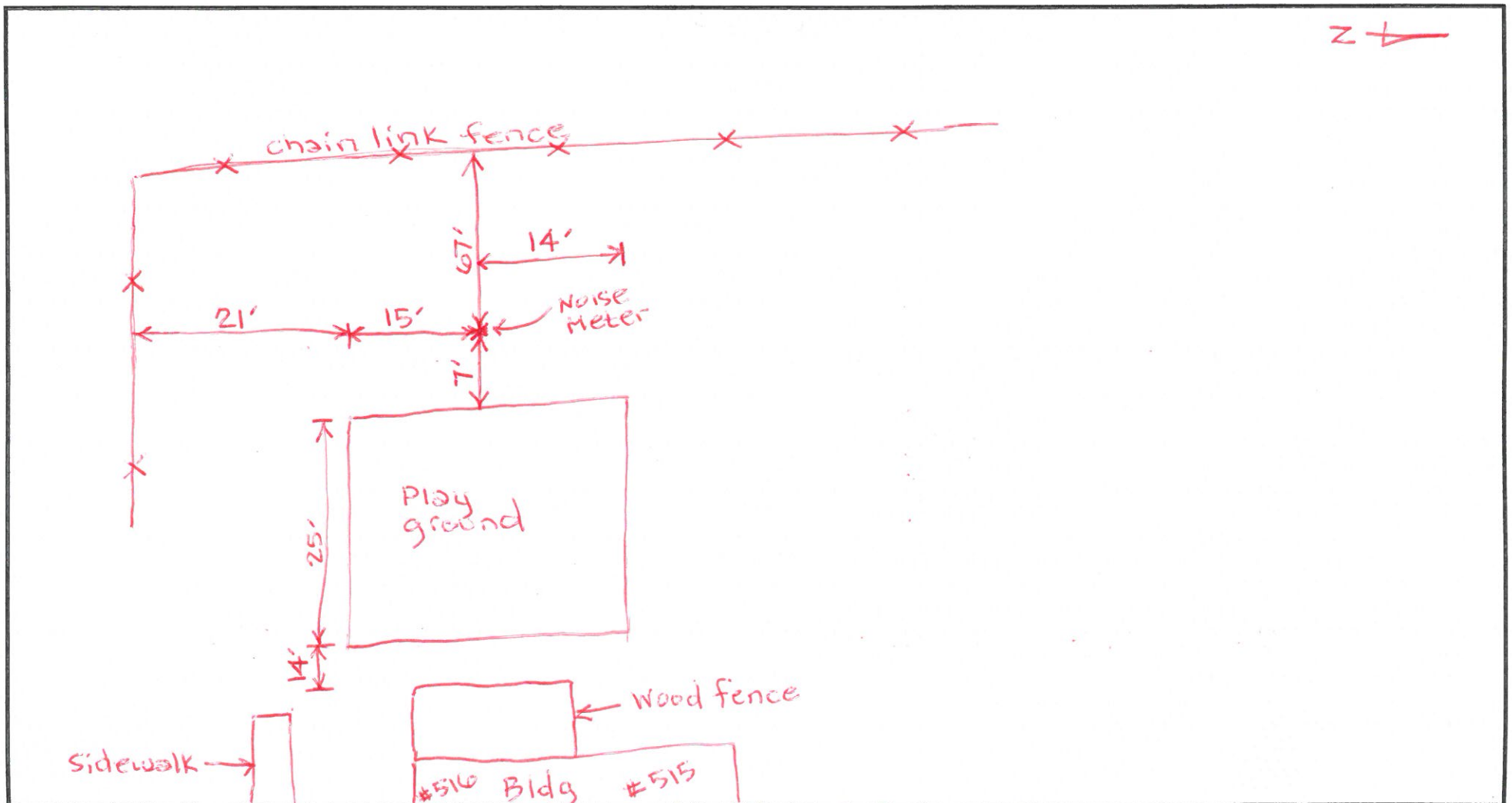
Major Sources: I-95

Unusual Events: \_\_\_\_\_

Other Notes: Actual speed clocked: Northlake WB 35 MPH, 25 EB Northlake 65 → I-95  
Posted Speed Limit 45 MPH

Picture 9 Looking N Picture 10 Looking S Picture 11 Looking E Picture 12 Looking W

## SKETCH



## NOISE MEASUREMENT DATA SHEET

Measurements Taken By: Brian Cummings Date: Oct. 26, 2016

Time Study Started: 7:04am-7:14am, 7:14am-7:24am, 7:24am-7:34am Time Study Ended: 7:34am

Project Identification: 25971 - Northlake Blvd. PD&E Study

Site Identification: Site #4

9519 Birmingham Drive

### Weather Conditions:

Sky: Clear \_\_\_\_\_ Partly Cloudy ✓ Cloudy \_\_\_\_\_ Other \_\_\_\_\_

Temperature: 77° Wind Speed 2-4 mph Wind Direction W-NW Humidity 59.6

**Equipment:**

**Sound Level Meter:**

Type: Quest Sound Pro 2 Serial Number: BII090019

Did you check the battery? Yes ✓ No       

Calibration Reading: Start 114.0 End 114.0

Response Settings: Fast ✓ Slow           

Weighting: A ✓ Other (identify) \_\_\_\_\_

**Calibrator:**

Type: Quest QC-10 114db-1000Hz Serial Number: QII090102

Did you check the battery? Yes ✓ No       

**Data File Numbers:** \_\_\_\_\_

# RESULTS

LMAX \_\_\_\_\_ LEQ ✓ L10 \_\_\_\_\_ L50 \_\_\_\_\_ L90 \_\_\_\_\_ L95 \_\_\_\_\_ Other \_\_\_\_\_

Background Noise: bird chatter (black birds)

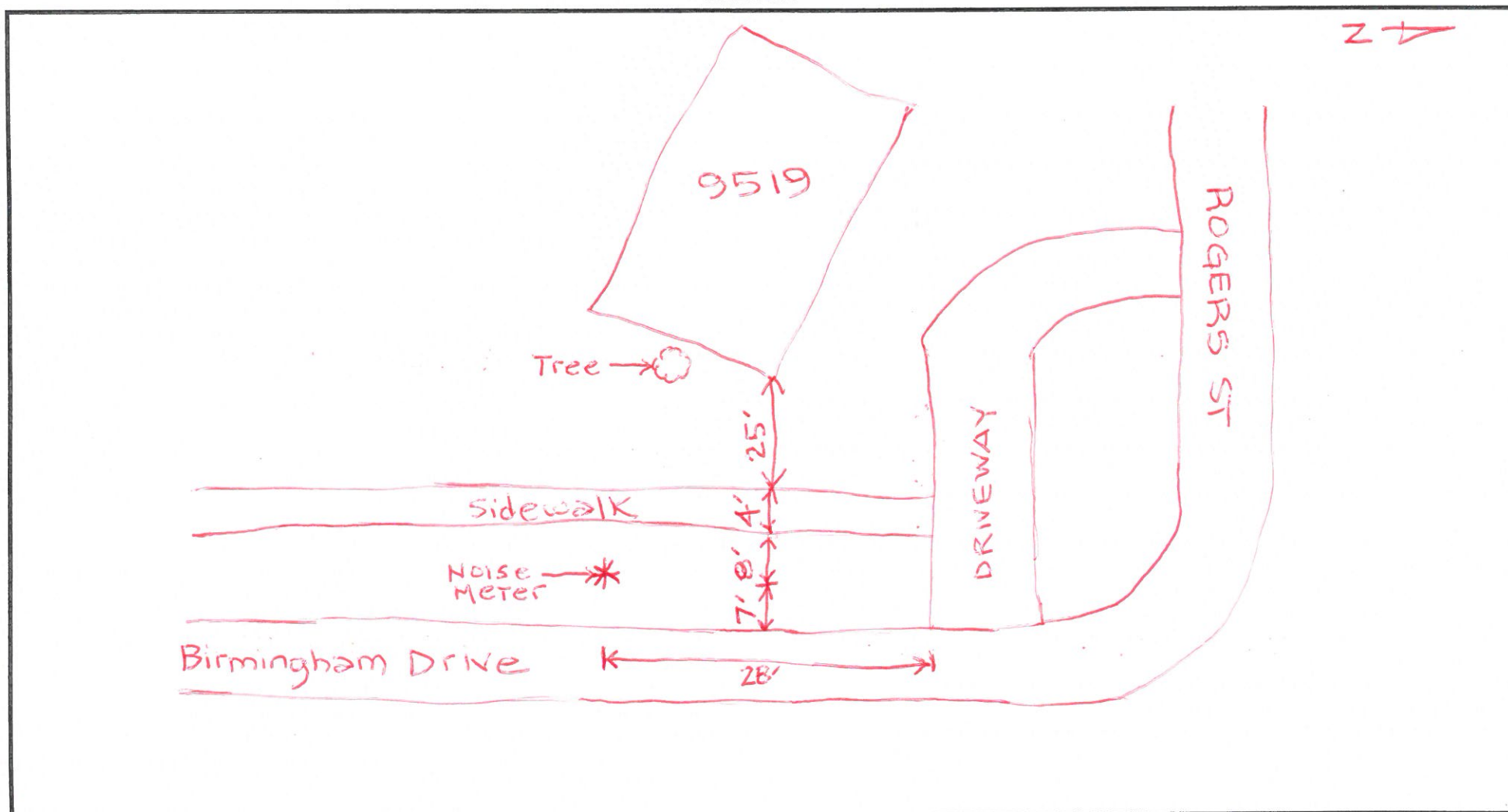
Major Sources: I-95 Southbound

Unusual Events: 8min into 1st Run car door slammed

Other Notes: Actual clocked speed: Northlake WB 35 MPH, EB 30 MPH I-95 NB 70 MPH, I-95 SB 75 MPH Northlake Posted Speed Limit 45 MPH 65 → I-95

Picture 13 Looking N Picture 14 Looking S Picture 15 Looking E Picture 16 Looking W

## SKETCH



# NOISE MEASUREMENT DATA SHEET

Measurements Taken By: Brian Cummings Date: Oct. 26, 2016

Time Study Started: 7:45-7:55am, 7:55am-8:05am, 8:05am-8:15am Time Study Ended: 8:15 am

Project Identification: 25971 - Northlake Blvd. PD&E Study

Site Identification: Site # 5  
9141 Birmingham Drive

## Weather Conditions:

Sky: Clear \_\_\_\_\_ Partly Cloudy ☒ Cloudy \_\_\_\_\_ Other \_\_\_\_\_  
Temperature: 77° Wind Speed 2-4 mph Wind Direction W-NW Humidity 61.2

## Equipment:

### Sound Level Meter:

Type: Quest Sound Pro 2 Serial Number: BII090019

Did you check the battery? Yes ☒ No \_\_\_\_\_  
Calibration Reading: Start 114.0 End 114.0  
Response Settings: Fast ☒ Slow \_\_\_\_\_  
Weighting: A ☒ Other (identify) \_\_\_\_\_

### Calibrator:

Type: Quest QC-10 114db-1000Hz Serial Number: QII090102

Did you check the battery? Yes ☒ No \_\_\_\_\_

Data File Numbers: \_\_\_\_\_

# RESULTS

LMAX \_\_\_\_\_ LEQ ✓ L10 \_\_\_\_\_ L50 \_\_\_\_\_ L90 \_\_\_\_\_ L95 \_\_\_\_\_ Other \_\_\_\_\_

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

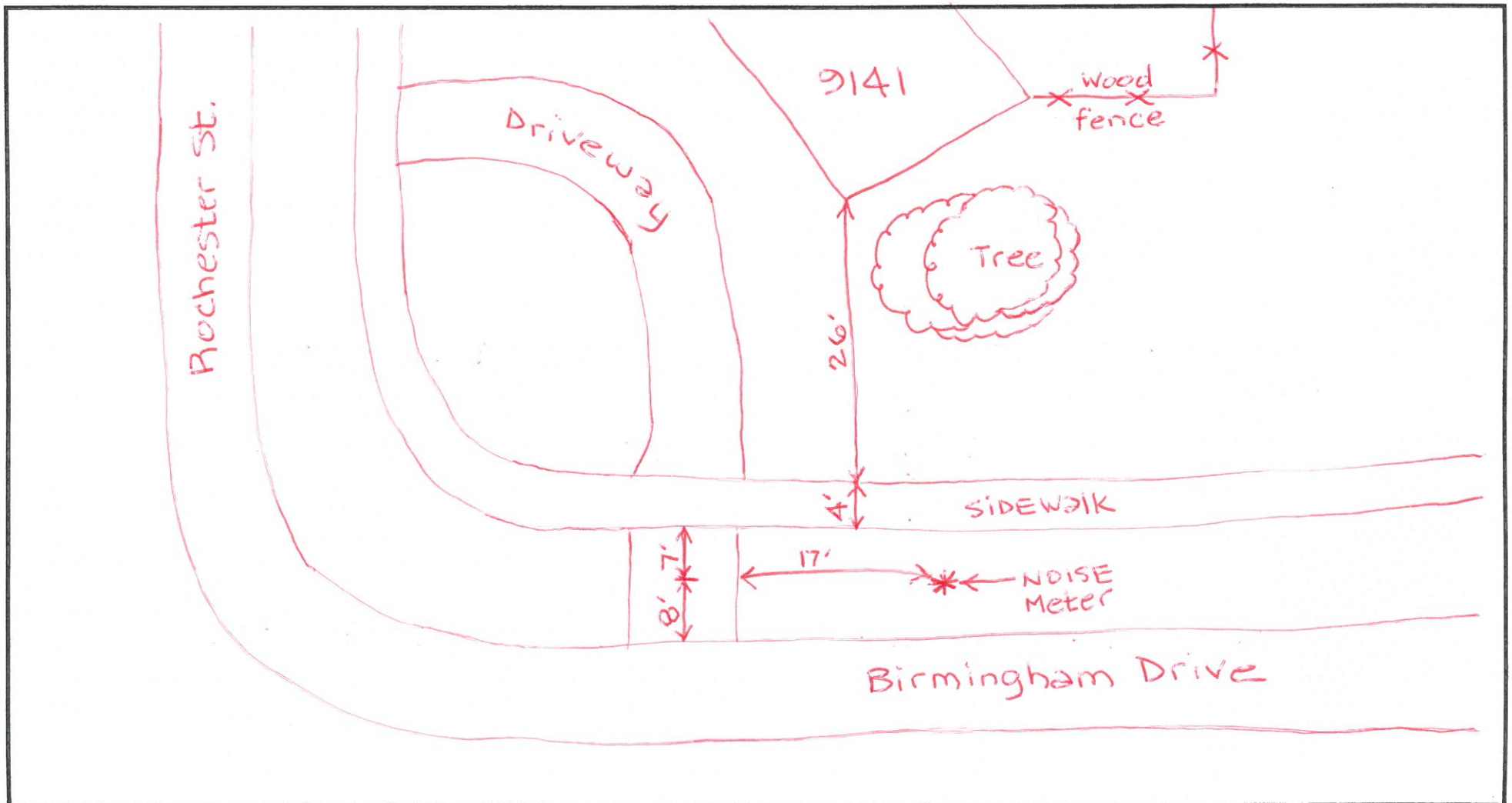
Major Sources: I-95 Southbound

Unusual Events: \_\_\_\_\_

Other Notes: Actual clocked speed: Northlake WB 35 MPH, EB 30 MPH I-95 NB 70 MPH, I-95 SB 75 MPH Northlake, 65 → I-95 Posted Speed Limit 45 MPH

Picture 17 Looking N Picture 18 Looking S Picture 19 Looking E Picture 20 Looking W

## SKETCH



## NOISE MEASUREMENT DATA SHEET

Measurements Taken By: Brian Cummings Date: Oct. 26, 2016

Time Study Started: 8:26am - 8:36am, 8:36am - 8:46am, 8:46am - 8:56am Time Study Ended: 8:56 am

Project Identification: 25971 - Northlake Blvd. PD&E Study

Site Identification: Site # 6

8679 40th Terrace N  
(Vacant Lot)

**Weather Conditions:**

Sky: Clear \_\_\_\_\_ Partly Cloudy ✓ Cloudy \_\_\_\_\_ Other \_\_\_\_\_

Temperature: 78° Wind Speed 1-3 mph Wind Direction W-NW Humidity 61.8

**Equipment:**

**Sound Level Meter:**

Type: Quest Sound Pro 2 Serial Number: BII090019

Did you check the battery? Yes ✓ No       

Calibration Reading: Start 114.0 End 114.0

Response Settings: Fast ☒ Slow ☐

Weighting: A ✓ Other (identify) \_\_\_\_\_

Calibrator:

Type: Quest QC-10 114db-1000Hz Serial Number: QII090102

Did you check the battery? Yes ☒ No ☐

**Data File Numbers:** \_\_\_\_\_

# RESULTS

LMAX \_\_\_\_\_ LEQ ✓ L10 \_\_\_\_\_ L50 \_\_\_\_\_ L90 \_\_\_\_\_ L95 \_\_\_\_\_ Other \_\_\_\_\_

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

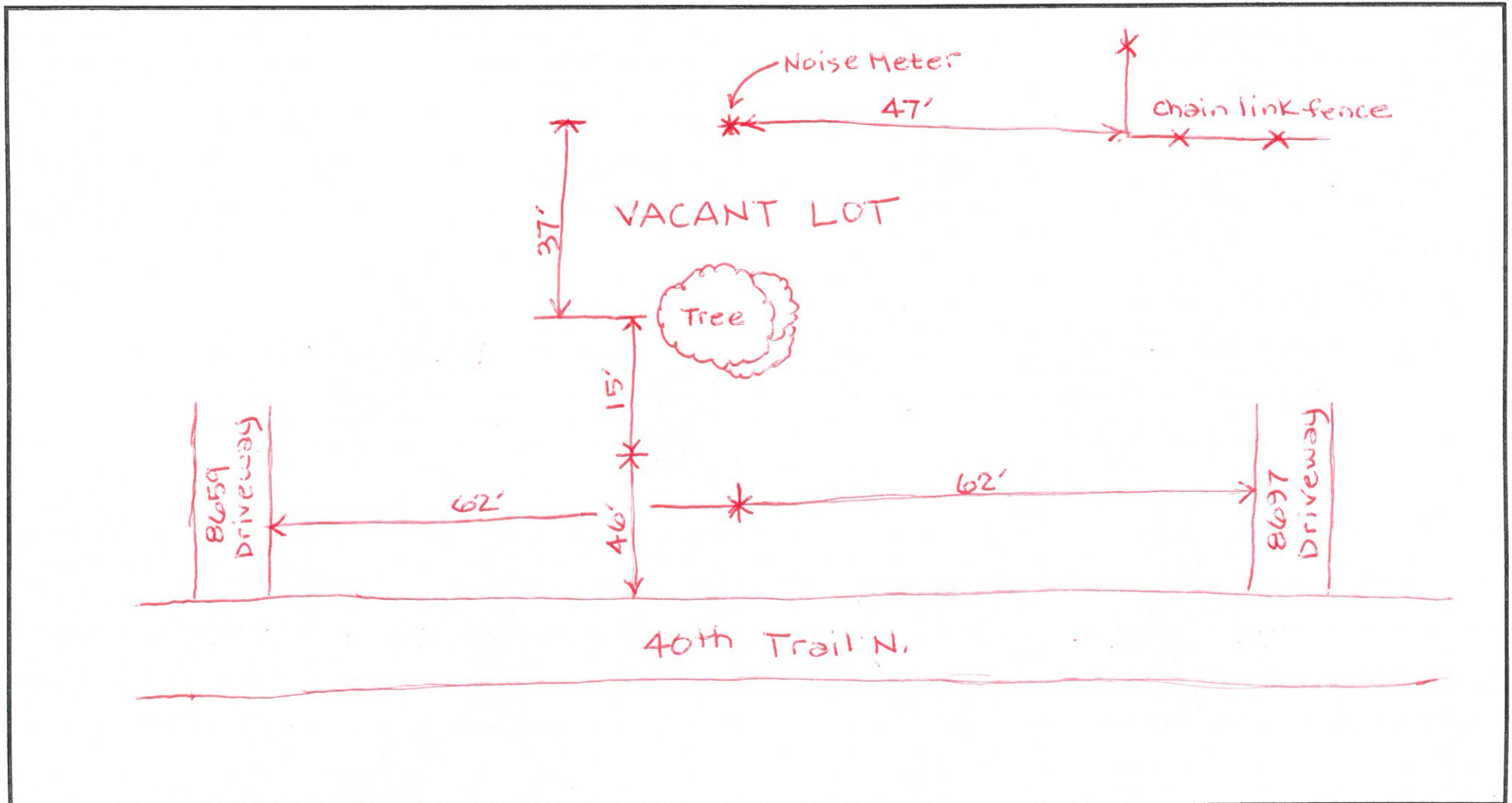
Major Sources: I-95 Southbound

Unusual Events: \_\_\_\_\_

Other Notes: Actual speed clocked: I-95 NB 70 MPH, I-95 SB 75 MPH  
Northlake WB 35 MPH, 30 MPH EB Northlake 65 → I-95  
Posted Speed Limit 45 MPH

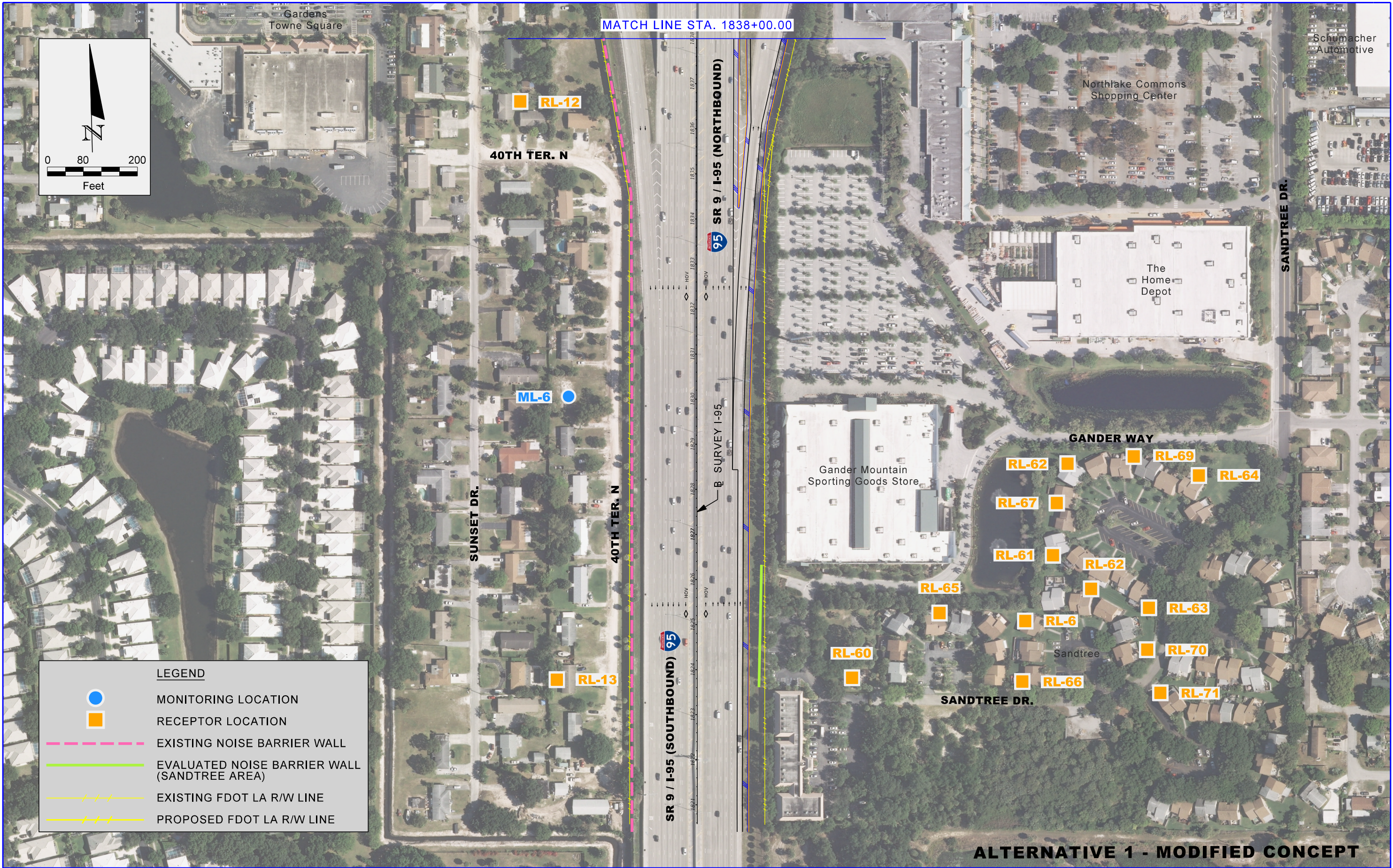
Picture 21 Looking N Picture 22 Looking S Picture 23 Looking E Picture 24 Looking W

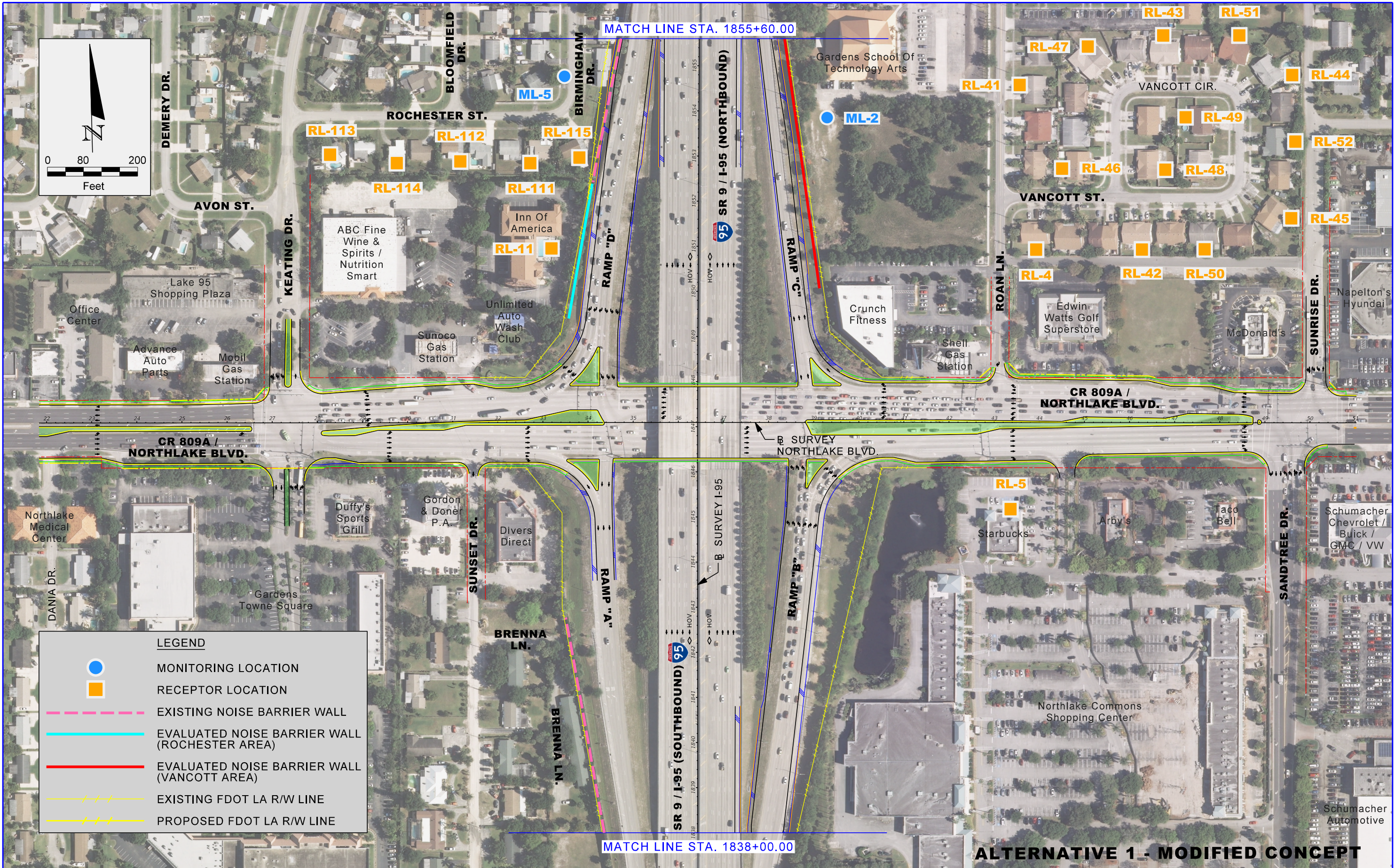
## SKETCH

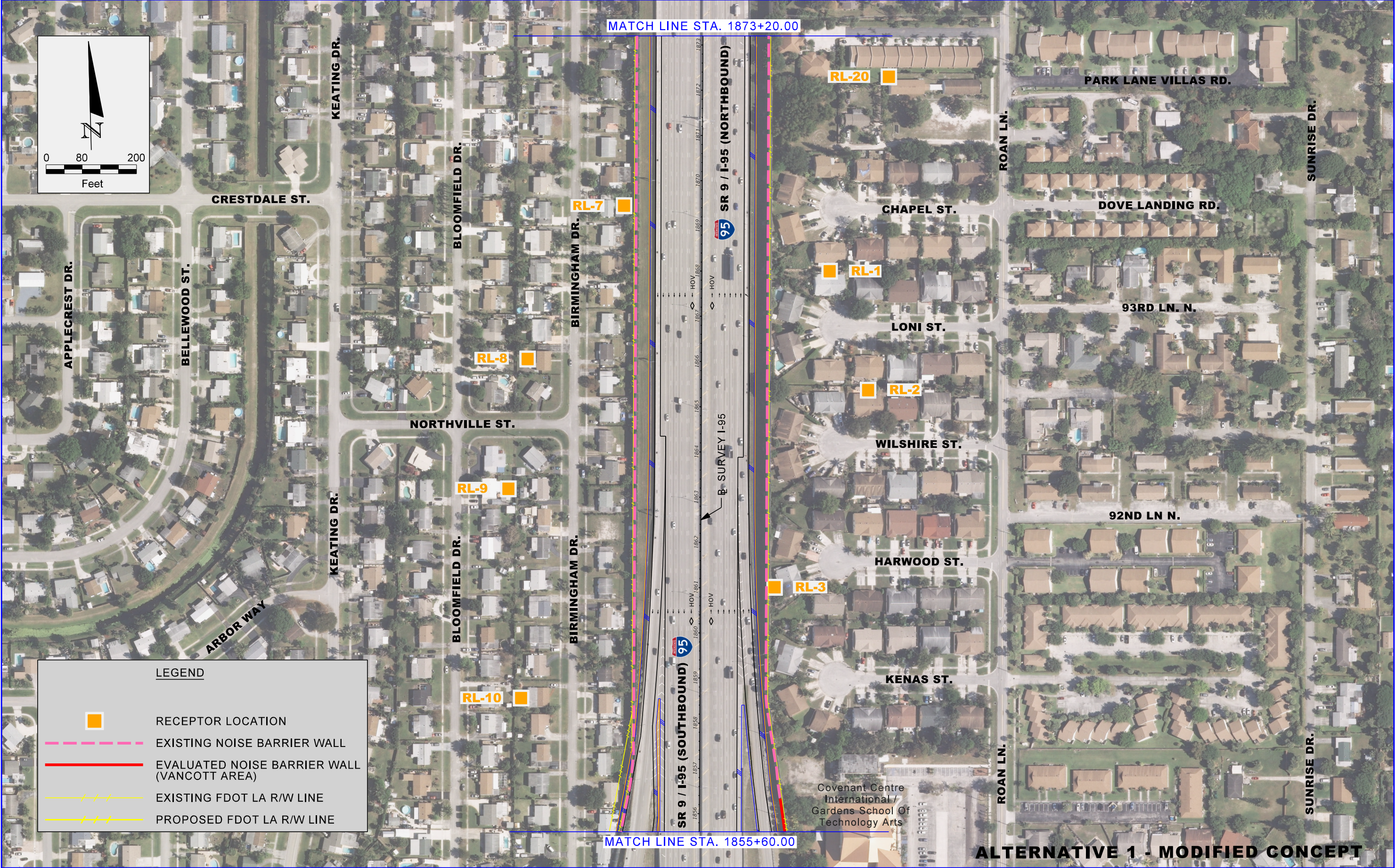


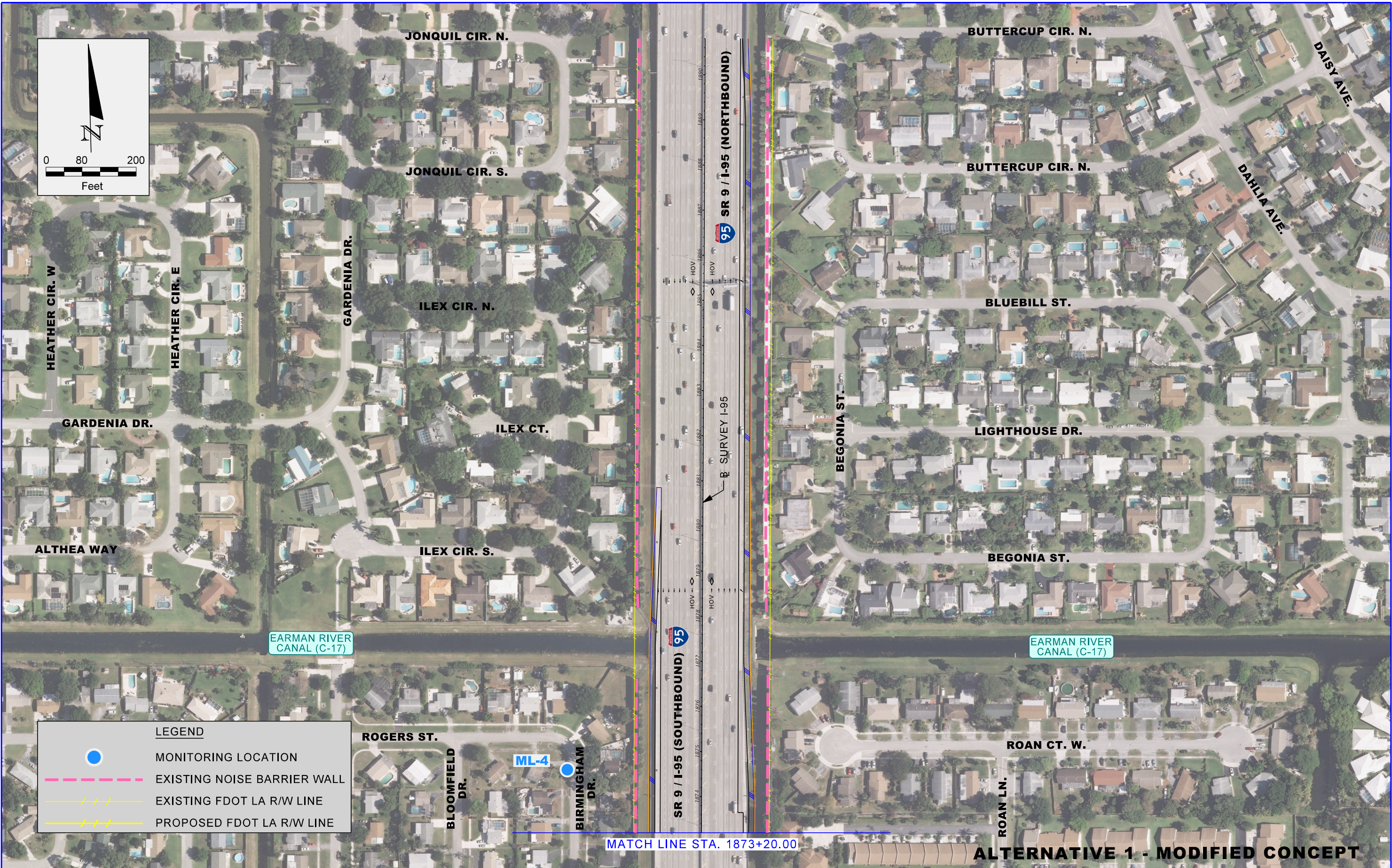
## Appendix C

### Conceptual Plans with Receptors









## Appendix D

### TNM Modeling Files