DRAFT PRELIMINARY ENGINEERING REPORT

Project Development & Environment Study
I-10 (SR 8) from I-295 to I-95
Duval County, Florida

Prepared for
Florida Department of Transportation – District Two
1109 South Marion Avenue
Lake City, Florida 32025-5874

Financial Project ID: 213326-2-22-01
ETDM Number: 14275

November 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 the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. §327 and a Memorandum of Understanding dated December 14, 2016 and executed by the Federal Highway Administration and FDOT.

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Draft Preliminary Engineering Report

Florida Department of Transportation
District 2

Financial Project ID: 213326-2-22-01
ETDM Numbers: 14275

This preliminary engineering report contains detailed engineering information that fulfills the purpose and need for the I-10 (SR 8) from I-295 to I-95 widening Project Development & Environment Study in Duval County. The environmental document is a Type 2 Categorical Exclusion (September 2017)

Date 11/13/ 2017

Gene Howerton, PE

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LIST OF ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ACM	Asbestos-Containing Material
ACS	American Community Survey
AN	Advanced Notification
APE	Area of Potential Effect
B/C	Benefit Cost
CAAA	Clean Air Act Amendments
CD	Concept Development
CDA	Concept Development Alternative
CEQ	Council on Environmental Quality
CFA	Core Foraging Area
CFR	Code of Federal Regulations
CRA	Community Redevelopment Area
CRAS	Cultural Resource Assessment Survey
CSER	Contamination Screening Evaluation Report
dBA	A-Weighted Decibel
DOA	Determination of Applicability
DOE	Degree of Effect
DOS	Department of State
DRI	Development of Regional Impact
EA	Environmental Assessment
EFH	Essential Fish Habitat
ERM	Environmental Resource Management
ESF	Emergency Support Functions
EST	Environmental Screening Tools
ETAT	Environmental Technical Advisory Team
ETDM	Efficient Transportation Decsision Making
FDEO	Florida Department of Economic Opportunity
FDEP	Florida Department of Environmental Protection
FDHR	Flordia Division of Historical Resources
FDOS	Flordia Department of State

FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FPPA	Farmland Protection Policy Act
FFWCC	Florida Fish and Wildlife Conservation Commission
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FLUCFCS	Florida Land Use Cover Forms Classificaiton System
FMSF	Florida Master Site File
FS	Florida Statute
FY	Fiscal Year
GIS	Geographic Information System
HSIP	Highway Safety Improvement Plan
ITS	Intelligent Transportation Systems
LDCA	Location and Design Concept Acceptance
LEP	Limited English Proficiency
LOS	Level of Service
LRTP	Long Range Transportation Plan
MLOU	Methodology Letter of Understanding
MOT	Maintenance of Traffic
MPO	Palm Beach Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Serve
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	Noise Study Area
NWI	National Wetland Inventory
PD&E	Project Development and Environment
PLEMO	Planning and Environmental Management Office
ROW	Right-of-Way

SALR	Seaboard Airline Railroad
SERPM	Southeast Regional Planning Model
SFHA	Special Flood Hazard Area
SFRC	South Florida Rail Corridor
SFRTA	South Florida Regional Transportation Authority
SFWMD	South Florida Water Management District
SHPO	State Historic Preservation Officer
SHSP	Strategic Highway Safety Plan
SIS	Strategic Intermodal System
SIMR	System Interchange Modification Report
SPUI	Single Point Urban Interchange
SR	State Road
STIP	State Transportation Improvement Plan
TDM	Transportation Demand Model
TIP	Transportation Improvement Plan
TUDI	Tight Urban Diamond Interchange
TSM	Transportation System Management
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WER	Wetlands Evaluation Report

1. Project Summary

The Florida Department of Transportation (FDOT) is conducting a Project Development and Environment (PD&E) Study for the widening of SR 8/Interstate 10 (I-10) from I-295 to I-95 in Duval County, Florida. The widening alternative developed in this PD&E Study and the associated social, economic, and environmental analyses were evaluated according to the requirements of the National Environmental Policy Act (NEPA) and FDOT's PD&E Manual, Part 1, Chapter 5 to receive Location and Design Concept Acceptance (LDCA). 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 the Federal Highway Administration (FHWA) and FDOT.

This preliminary engineering report contains detailed engineering information on existing conditions, alternatives considered, and recommendations for the widening of I-10 from I-295 to I-95.

1.1 Project Location

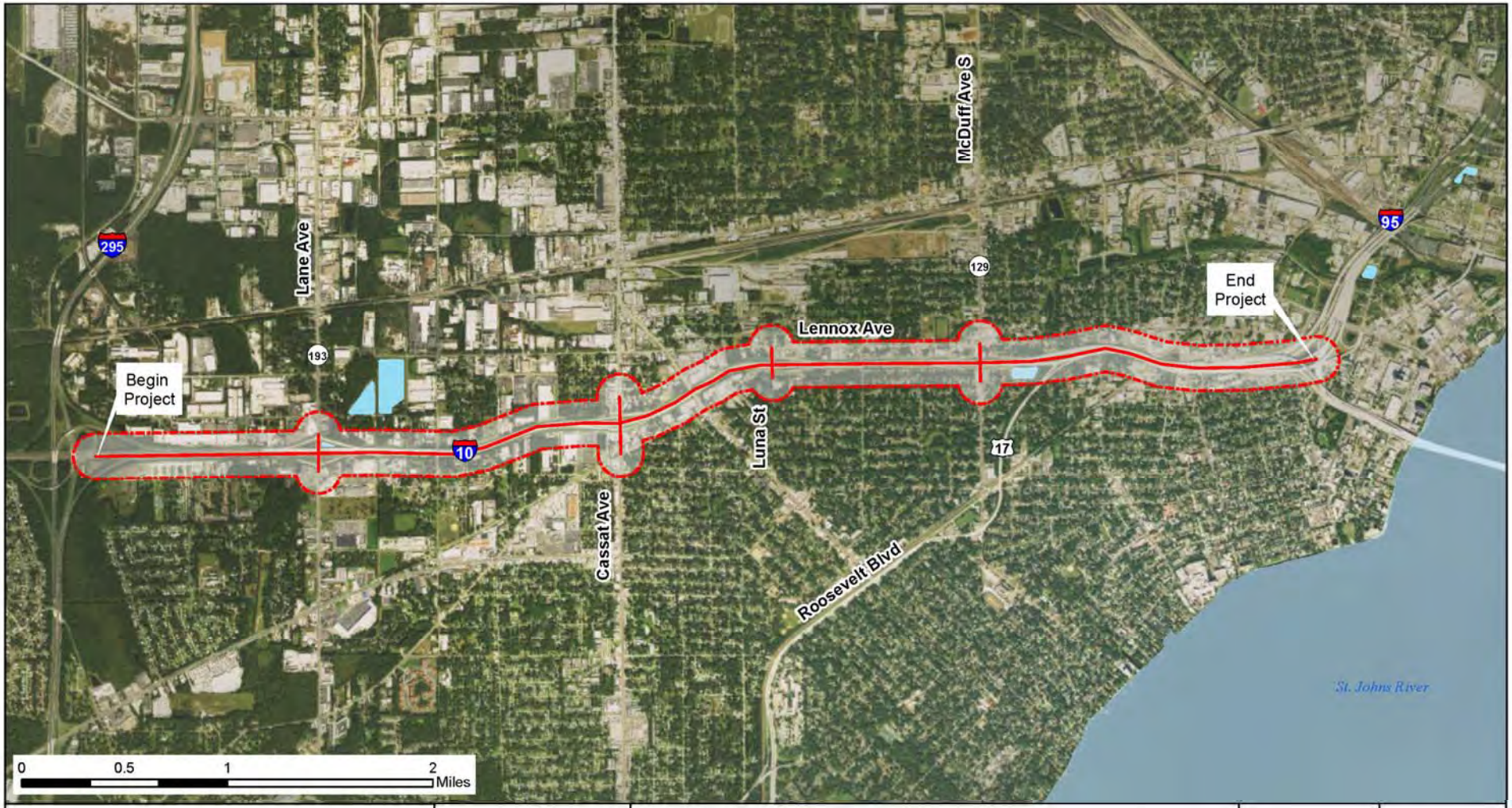
The project study area (study area) is in central Duval County within the City of Jacksonville between I-295 to the west and I-95 to the east. The project is located between Mile Marker (MM) 356 or Mile Post (MP) 16.159 (Straight Line Diagrams) near I-295 and MM 362 or MP 21.441 near I-95, an approximately 5-mile long corridor. A project location map is provided in **Figure 1-1**.

1.2 Purpose and Need

The purpose of this project is to add capacity to the I-10 (SR 8) corridor from I-295 to I-95 in order to improve capacity and traffic operations, and accommodate projected growth. The need for the project is based on the following factors:

Transportation Capacity: As shown in **Table 1-1**, the segment of I-10 (SR 8) between I-295 and I-95 currently experiences peak period congestion with speeds below the posted speed limits due to demand that exceeds capacity. In 2014, I-10 (SR 8) operated at LOS F between Lane Avenue (SR 103) and Roosevelt Boulevard (US 17) while the segments between I-295 and Lane Avenue (SR 103) and Roosevelt Boulevard (US 17) and I-95 operated at LOS C and D respectively. By 2040, the entire segment of I-10 (SR 8) within the study limits will operate at LOS F. **Table 1-2** shows the year 2040 LOS information for the project area of along I-10 (SR 8) with a single lane addition in either direction. All segments except for the segment between I-295 and Lane Avenue (SR 103) is anticipated to operate at LOS F. Providing LOS D for this project would require two additional general-purpose lanes in each direction for a total of four lanes added to I-10 (SR 8).

Without capacity or other improvements, this entire segment of I-10 (SR 8) will be expected to accommodate an approximate increase in traffic of 52 percent in the next 25 years. The resulting congestion will progressively increase with periods of congestion extending beyond the normal AM and PM peak periods.



PD&E Study
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PROJECT LOCATION

Project Area
500-Foot Buffer
Proposed Ponds

N

FIGURE
1-1

Table 1-1. I-10 (SR 8) Peak Hour Traffic and LOS from I-295 to I-95

Facility	Segment	Lanes	2014		2040	
			Peak Hour Volume	Level of Service	Peak Hour Volume	Level of Service
I-10 (SR 8)	I-295 to Lane Avenue (SR 103)	3 + 1 auxiliary lane	5,859	C	8,881	F
I-10 (SR 8)	Lane Avenue (SR 103) to Cassat Avenue (SR 111)	3	6,250	F	8,683	F
I-10 (SR 8)	Cassat Avenue (SR 111) to McDuff Avenue (SR 129)	3	6,120	F	7,615	F
I-10 (SR 8)	McDuff Avenue (SR 129) to Roosevelt Boulevard (US 17)	3	6,337	F	9,742	F
I-10 (SR 8)	Roosevelt Boulevard (US 17) to I-95	5	8,537	D	13,186	F

Source: FDOT Florida Traffic Online 2014; Table 7 of 2012 FDOT Generalized Level of Service Tables

Table 1-2. I-10 (SR 8) Projected 2040 Volumes with Additional Lane in Each Direction from I-295 to I-95

Facility	Segment	Bidirectional Lanes	Max Daily Capacity (LOS D)	2040 Traffic from NERPM	2040 LOS
I-10 (SR 8)	I-295 to Lane Avenue (SR 103)	10	194.500	168,715	D
I-10 (SR 8)	Lane Avenue (SR 103) to Cassat Avenue (SR 111)	8	154,300	163,255	F
I-10 (SR 8)	Cassat Avenue (SR 111) to McDuff Avenue (SR 129)	8	154,300	167,082	F
I-10 (SR 8)	McDuff Avenue (SR 129) to Roosevelt Boulevard (US 17)	8	154,300	179,938	F
I-10 (SR 8)	Roosevelt Boulevard (US 17) to I-95	12	256,600	260,833	F

Source: Northeast Florida regional Planning Model 2040; Table 1 of 2012 FDOT Generalized Level of Service Tables

Social/Economic Demand: I-10 (SR 8) serves major east-west traffic movements through the Jacksonville urban area, connecting suburban areas west of Jacksonville to Downtown Jacksonville as well as office, commercial, and industrial areas that are found along the I-10 (SR 8) corridor. Traffic demand on I-10 (SR 8) is directly related to population and employment changes. As shown in **Table 1-3**, the population of Duval County is expected to increase by approximately 24% from 2010 to 2040. Employment is expected to increase by 23% during the same time period.

Table 1-3. Duval County Population and Employment Projections

County	Year 2010 Population living in Households	Year 2040 Population living in Households	Population Growth Rate 2010-2040	Year 2010 Total Workers	Year 2040 Estimated Workers	Employment Growth Rate 2010-2040
Duval	844,293	1,050,684	24%	519,142	636,596	23%

Source: Path Forward 2040 LRTP, Technical Memorandum #8, Needs Plan

The population and employment projections show that traffic volumes will continue to increase in line with the population growth. A long-term mobility option is needed that will not only serve current traffic volumes, but will accommodate the population and employment growth expected between 2015 and 2040. Without any improvements, the residents and workers in the surrounding areas will face more congestion, leading to lost productivity and increase in air pollution.

Transportation Demand: I-10 (SR 8) is a designated highway on FDOT's Strategic Intermodal System (SIS), which is a statewide network of highways, railways, waterways and transportation hubs that handle the bulk of Florida's passenger and freight traffic. The need for capacity expansion of I-10 (SR 8) between I-295 and I-95, is included in the FDOT's Adopted Five Year Plan, dated July 2015. The project is included in the North Florida TPO's FY 2015/16 - 2019/20 Transportation Improvement Program (TIP) adopted in June 2015 and in The North Florida TPO's Path Forward 2040 LRTP which was adopted in November 2014.

Modal Interrelationships: I-10 (SR 8) connects with multiple other SIS facilities, including I-295 and I-95 and provides direct access to Downtown Jacksonville from the western side of the Jacksonville Urbanized Area and further to the west, I-75 and the Florida Panhandle. I-10 (SR 8) provides a key transportation element in linking the major ports, airports, and railways that handle Florida's passenger and freight traffic throughout the region.

1.3 Description of Proposed Action

The proposed project will add two additional general-purpose lanes in each direction of travel on I-10 (SR 8) from I-295 to I-95. This addition will enhance the capacity of I-10 (SR 8) and will convert the existing 6-lane typical section to a 10-lane typical section within the project limits. In addition, the proposed project will provide noise walls for noise abatement and provide stormwater ponds for drainage.

1.3.1 Description of the Recommended Alternative

The recommended Build Alternative for this project area was chosen by FDOT as the additional of two additional general-purpose lanes to existing I-10 (SR 8) between I-295 and I-95 to make this section a 10-lane typical section.

1.4 Commitments and Recommendations

The FDOT is committed to the following measures:

The FDOT will implement the U.S. Fish and Wildlife Service *STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE* (August 12, 2013) during project construction.

The FDOT is committed to the construction of feasible and reasonable noise abatement measures at the identified noise-impacted locations contingent upon the following conditions:

- Detailed noise analyses during the final design process supports the need, feasibility, and reasonableness of providing abatement;
- Cost analysis indicates that the cost of the noise barrier will not exceed the cost reasonable criterion;
- Community input concerning location of the noise barrier(s) is solicited and the affected property owners support construction of the noise barrier;
- Safety and engineering aspects as related to the roadway user and the adjacent property owner have been reviewed and any conflicts or issues resolved; and
- Any other mitigation circumstances revealed during final design have been analyzed and resolved.

2. Existing Conditions

2.1 Roadway Classification

The typical characteristics of the roadway facilities located within the project limits are shown in **Table 2-1**. The data is based on information gathered from the FDOT's Roadway Characteristics Inventory, Straight Line Diagrams (SLDs), and field reviews conducted for the PD&E Study. Four service interchanges and one system-to-system interchange are located along I-10 (SR 8) within the project limits. The service interchanges include: Lane Avenue (SR 103), Cassat Avenue (SR 111), Luna Street/Lenox Avenue and McDuff Avenue (SR 129). The system-to-system interchange includes the Roosevelt Boulevard (US 17).

I-10 (SR 8) is a limited access freeway and a designated Strategic Intermodal System (SIS) facility that provides regional connectivity along the northeast coast of Florida. The existing I-10 (SR 8) typical section consists of three general purpose lanes in each travel direction (eastbound/westbound). One auxiliary lane is provided along I-10 (SR 8) in each travel direction between the I-295 and Lane Avenue (SR 103) interchanges.

Table 2-1. Existing Roadway Characteristics

Roadway	Facility Type	Functional Classification	Access Class	Typical Section	Posted Speed Limit (mph)
I-10 (SR 8) – Between I-295 to Roosevelt Blvd. (US 17)	Interstate, Limited Access, SIS Facility	Urban Interstate	1	3 EB GP lanes + 3 WB GP lanes + Barrier wall	55
I-10 (SR 8) – Between Roosevelt Blvd. (US 17) to I-95	Interstate, Limited Access, SIS Facility	Urban Interstate	1	5 EB GP lanes + 5 WB GP lanes + Barrier wall	50
Service Interchanges					
Lave Avenue (SR 103)	Arterial	Urban Minor Arterial	6	2 NB lanes + 2 SB lanes + Turn lanes + Raised median	40
Cassat Avenue (SR 111)	Arterial	Urban Minor Arterial	6	2 NB lanes + 2 SB lanes + Turn lanes	35
Luna Street/Lenox Avenue	Arterial	Urban Minor Arterial	N/A	1 NB lane + 1 SB lane + Turn lanes	30
McDuff Avenue (SR 129)	Arterial	Urban Minor Arterial	6	2 NB lanes + 2 SB lanes + Turn lanes	30
System-to-System Interchange					
Roosevelt Blvd. (US 17)	Arterial	Urban Principle Arterial - Expressway	1	2 NB lanes + 2 SB lanes + Barrier wall	50

NB – northbound, SB – southbound, EB – eastbound, WB – westbound
GP – general purpose, mph – miles per hour

2.2 Typical Section and Alignment

The existing typical section for I-10 (SR 8) is a six-lane, divided, limited access roadway facility with 12' travel lanes, inside shoulders varying between 7' to 12', 10' minimum outside shoulders, and a median barrier wall. The posted speed limit is 55 miles per hour (mph) along I-10 (SR 8) between I-295 and Roosevelt Boulevard (US 17) and 50 mph between Roosevelt Boulevard (US 17) and I-95.

Figure 2-1 shows the general existing roadway typical section for I-10 (SR 8) for the project study area.

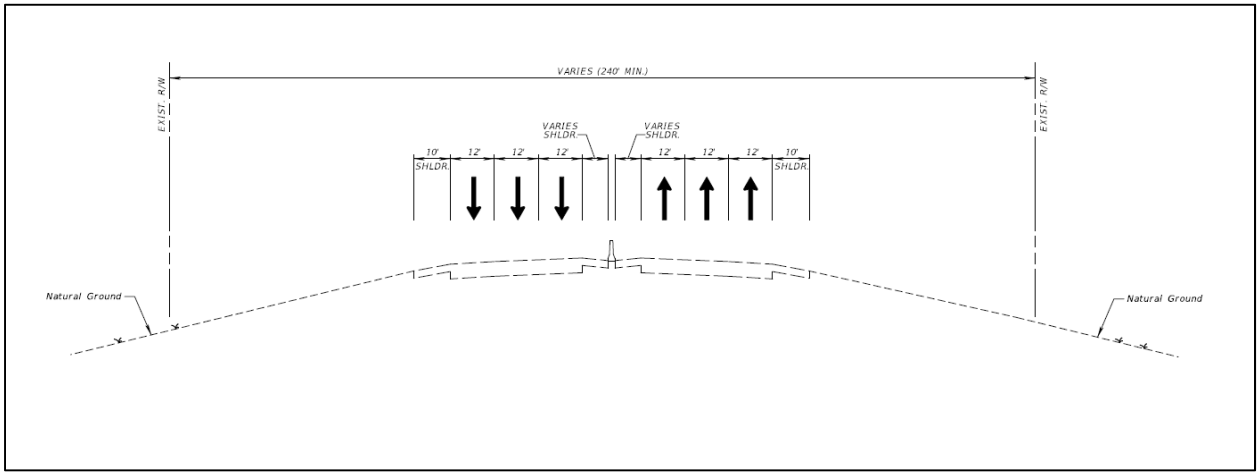


Figure 2-1. General Existing Roadway Typical Section – I-10 (SR 8)

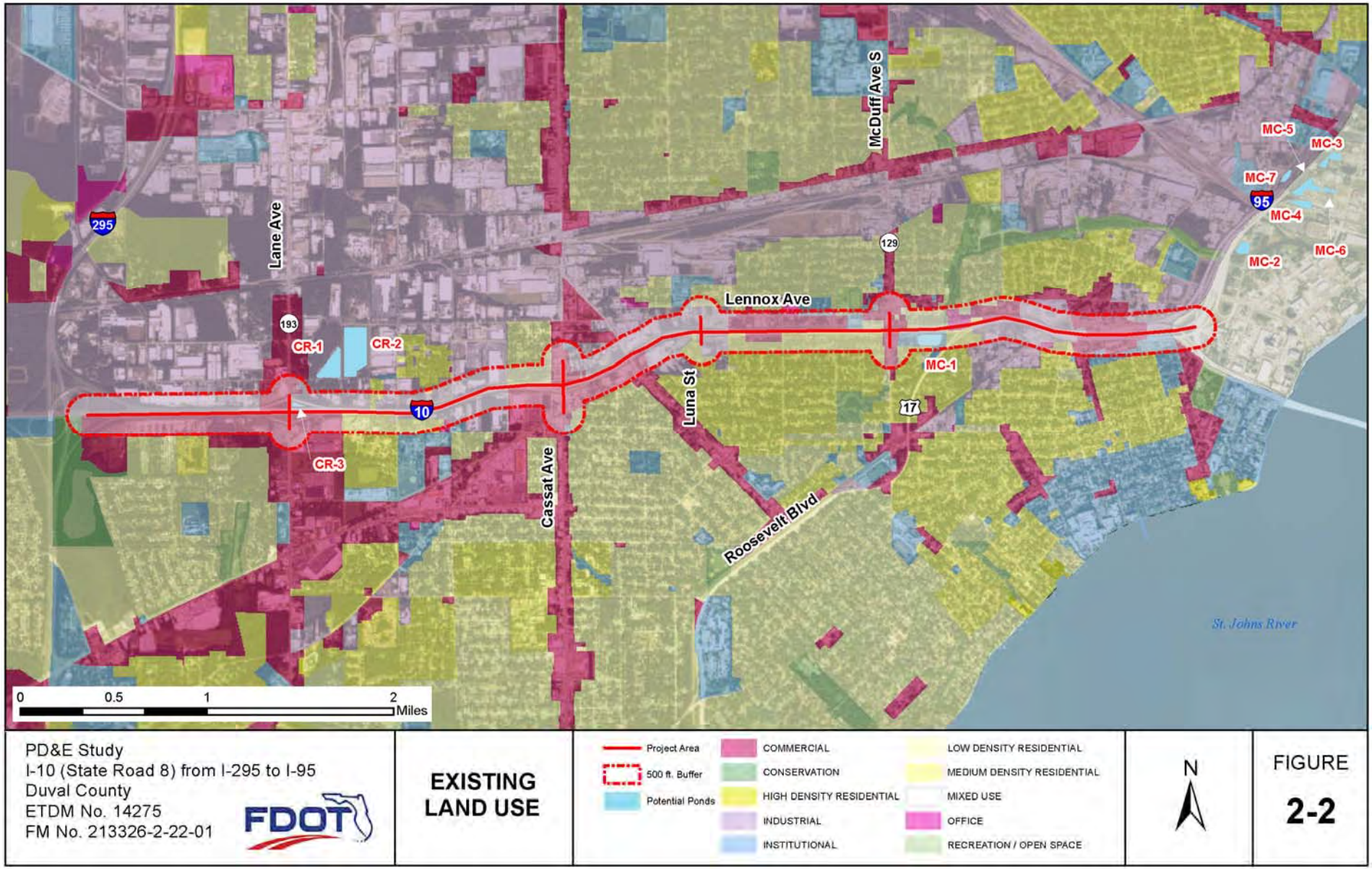
2.3 Right of Way

The existing limited access right of way (ROW) for mainline I-10 (SR 8) is approximately 298' minimum between I-295 and Ellis Road and approximately 240' minimum between Ellis Road and I-95. The ROW varies within the interchanges and between Roosevelt Boulevard (US 17) and I-95. The existing ROW limits for I-10 (SR 8) within the project limits are shown on the Concept Plans in **Appendix A**.

2.4 Existing Land Uses

The existing land uses within the project limits consist primary of commercial, office and industrial land uses between I-295 and Luna Street. Low to medium density residential, commercial, office and industrial land uses are present along I-10 (SR 8) between Luna Street and I-95. There are a few institutional and public/semi-public land uses primarily comprising of churches and governmental entities (FDOT) along I-10 (SR 8) within the project limits. The commercial and industrial land uses are situated along major arterial roadways like Lane Avenue (SR 103), Cassat Avenue (SR 111), and McDuff Avenue (SR 129).

To further characterize the project area, the existing land uses and cover types were identified with a 500-foot project buffer using the St. Johns River Water Management District's (SJRWMD) 2011 land use Geographical Information Systems (GIS) data and Florida Land Use Cover Forms Classification System (FLUCFCS) codes (**Figure 2-2**). Analysis of this data indicates 78 percent of the project areas is classified as urban and built-up and 21 percent transportation. Most of the existing land use is classified as residential, commercial, light industrial and roads and highway land uses. Land use by classification, acreage, and percentage within the 500-foot project area buffers are presented in **Table 2-2**.


McDuff Ave S
Lane Ave
295
193
CR-1
CR-2
CR-3
10
Lennox Ave
129
Luna St
Cassat Ave
Roosevelt Blvd
17
MC-1
MC-2
MC-3
MC-4
MC-5
MC-6
MC-7
95
St. Johns River
0
0.5
1
2
Miles
PD&E Study
I-10 (State Road 8) from I-295 to I-95
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EXISTING LAND USE
Project Area
500 ft. Buffer
Potential Ponds
COMMERCIAL
CONSERVATION
HIGH DENSITY RESIDENTIAL
INDUSTRIAL
INSTITUTIONAL
LOW DENSITY RESIDENTIAL
MEDIUM DENSITY RESIDENTIAL
MIXED USE
OFFICE
RECREATION / OPEN SPACE
N
FIGURE
2-2

Table 2-2. Land Use and Cover

Description	Acres within 500-Foot Project Area Buffer	Percent
Residential, Low Density	51	4.0%
Residential, Medium Density	112	8.0%
Commercial	339	26.0%
Conservation	4	0.5%
Recreation/Open Space	4	0.5%
Industrial	447	34.0%
Office	12	1.0%
Mixed Use	24	2.0%
Institutional	43	3.0%
Roads and Highways	282	21.0%
TOTAL	**1,318**	**100.0%**

2.5 Horizontal and Vertical Alignment

2.5.1 Horizontal Alignment

The existing horizonal alignments of I-10 (SR 8) between I-295 and I-95 was evaluated to determine if the existing facility meets current design standards for horizontal curves and superelevation. Superelevation rates and length of horizontal curves were checked to see if they meet the current FDOT Plans Preparation Manual (PPM) standards for the provided radii of existing curves. There is a total of 11 horizontal curves along the I-10 (SR 8) alignment with large radii. The curve lengths vary from 121' to 1,469'. It was determined from the evaluation that none of the existing horizontal geometry has adequate superelevation, according to current FDOT PPM standards.

The existing design criteria evaluated are presented in **Tables 2-3**.

2.5.2 Vertical Alignment

The existing vertical alignment of I-10 (SR 8) between I-295 and I-95 was evaluated to determine if the existing facility meets current design standards for vertical curves and sight distances. The existing vertical design criteria evaluated are presented in **Table 2-4**.

2.6 Structures

There is a total of 15 existing bridge structures within the I-10 (SR 8) from I-295 and I-95 project study area. Bridge structures within the study area were examined for deficiencies based on the comparison of the existing condition to the current FDOT design standards. The existing conditions have been obtained from the Bridge Inspection reports for each structure analyzed. Criteria examined included vertical clearance, horizontal clearance and sufficiency rating. Structures analyzed included overpasses at the following crossroads: Lane Avenue (SR 103), Ellis Road, Cassat Avenue (SR 111), Edgewood Avenue, Lenox Avenue/Luna Street, Nelson Street, McDuff Avenue (SR 129), Roosevelt Boulevard (US 17), King Street, CSX Railroad, and Stockton Street. As presented in **Table 2-5**, all bridge structures along

Table 2-3. Existing Horizontal Alignment – I-10 (SR 8)

No.	Location	Baseline/ Centerline	Curve Name	PC Station	Curve Radius (Feet)	Curve Length (Feet)	PI Station	Line Length (Feet)	Super Elevation (Feet/Feet)	Deflection Angle
1	Between I-295 and Lane Ave. (SR 103)	I10_CL					10+00.00	9132.47	NC	N 89° 17' 01.00" E
2	Between I-295 and Lane Ave. (SR 103)	I10_CL					101+32.47	1446.64	NC	N 89° 16' 00.65" E
3	Over Lane Ave. (SR 103)	I10_CL	I10_CL1	115+79.10	25000.00	889.31			NC	S 88° 41' 42.03" E
4	Between Lane Ave. (SR 103) and Cassat Ave. (SR 111)	I10_CL	I10_CL2	138+51.71	3050.00	1206.09			0.035	N 68° 38' 52.73" E
5	Approaching Cassat Ave. (SR 111)	I10_CL	I10_CL3	155+58.11	3000.00	1057.62			-0.035	N 88° 50' 49.57" E
6	Over Cassat Ave. (SR 111)	I10_CL	I10_CL4	175+91.34	2865.00	1469.39			0.037	N 59° 27' 41.10" E
7	Approaching Luna Ave.	I10_CL	I10_CL5	203+44.39	1525.00	806.37			-0.071	N 89° 45' 27.13" E
8	Departing McDuff Ave. (SR 129)	I10_CL					267+10.28		NC	
9	Approaching Roosevelt Blvd. (US 17) Overpass (EB)	I10_BL_EB					724+89.48	783.67	NC	N 89° 44' 00.00" E
10	Over Roosevelt Blvd. (US 17) Ramp (EB)	I10_BL_EB	I10_BL_EB1	732+73.15	2128.09	637.96			0.055	N 72° 33' 26.06" E
11	Over King St. (EB)	I10_BL_EB	I10_BL_EB2	742+18.27	1844.16	1322.88			-0.055	S 66° 20' 33.05" E
12	Between McDuff Ave. (SR 129) and King St. (WB)	I10_BL_WB	I10_BL_WB1	724+89.48	2986.28	588.97			-0.045	N 78° 25' 59.12" E
13	Over King St. (WB)	I10_BL_WB	I10_BL_WB2	741+01.29	2377.60	1461.77			0.043	S 66° 20' 27.21" E
14	Over CSX Railroad	I10_CL2					655+63.51	267.12	NC	S 66° 20' 27.21" E
15	Over Stockton St. (EB)	I10_CL2	I10_CL2_1	658+30.63	2262.4	943.73			0.060	N 89° 45' 32.45" E
16	Over Stockton St. (WB)	I10_CL2	I10_CL2_2	679+15.29	7639.42	121.06			NC	S 89° 19' 58.86" E

Table 2-4. Existing Vertical Alignment – I-10 (SR 8)

No.	Location	Baseline/Centerline	PVI Station	Type of Curve	Grade Differential (%)	K Value	Curve Length (Feet)
1	Approaching Lane Ave. (SR 103) Bridge	I10_CL	103+35.00	Sag	-0.65 to 3.0	109.59	400
2	Bridge over Lane. Ave (SR 103)	I10_CL	110+72.55	Crest	3.0 to -3.0	158.33	950
3	Departing Lave Ave. (SR 103) Bridge	I10_CL	119+00.00	Sag	-3.0 to -0.03	134.68	400
4	Approaching Ellis Rd. Bridge	I10_CL	126+24.33	Sag	-0.03 to 3.0	132.01	400
5	Bridge over Ellis Rd.	I10_CL	137+03.03	Crest	3.0 to -3.0	158.33	950
6	Departing Ellis Rd. Bridge	I10_CL	143+98.70	Sag	-3.0 to -0.08	136.99	400
7	Approaching Cassat Ave. (SR 111) Bridge	I10_CL	172+69.66	Sag	0.0 to 3.0	150.00	450
8	Bridge over Cassat Ave. (SR 111)	I10_CL	178+65.58	Crest	3.0 to -3.0	83.33	500
9	Between Cassat Ave. (SR 111) and Edgewood Ave.	I10_CL	187+20.00	Sag	-3.0 to 3.0	141.67	850
10	Bridge over Edgewood Ave.	I10_CL	196+10.00	Crest	3.0 to -3.0	83.33	500
11	Between Edgewood Ave. and Luna St.	I10_CL	204+96.16	Sag	-3.0 to 3.0	150.00	900
12	Bridge over Luna St.	I10_CL	215+15.00	Crest	3.0 to -3.0	83.33	500
13	Between Luna St. and Nelson St.	I10_CL	225+60.00	Sag	-3.0 to 3.0	175.00	1050
14	Bridge over Nelson St.	I10_CL	234+95.00	Crest	3.0 to -3.0	83.33	500
15	Between Nelson St. and Day Ave. Pedestrian Underpass	I10_CL	242+29.04	Sag	-3.0 to 2.5	109.09	600
16	Over Day Ave. Pedestrian Underpass	I10_CL	248+11.52	Crest	2.5 to -2.5	110.00	550
17	Between Day Ave. Pedestrian Underpass and McDuff Ave. (SR 129)	I10_CL	256+90.00	Sag	-2.5 to 3.0	109.09	600
18	Bridge over McDuff Ave. (SR 129)	I10_CL	261+78.94	Crest	3.0 to -3.0	83.33	500

No.	Location	Baseline/Centerline	PVI Station	Type of Curve	Grade Differential (%)	K Value	Curve Length (Feet)
19	Approaching Bridge over Roosevelt Blvd. (US 17) Ramp (EB)	I10_BL_EB	729+45.00	Sag	-3.0 to 3.0	83.33	500
20	Bridge over Roosevelt Blvd. (US 17) Ramp (EB)	I10_BL_EB	737+40.00	Crest	3.0 to 0.3	166.67	450
21	Bridge over King St. (EB)	I10_BL_EB	746+75.00	Crest	0.3 to -1.818	188.86	400
22	Between King St. and CSX Railroad (EB)	I10_BL_EB	751+67.98	Sag	-1.818 to 2.9	74.19	350
23	Between McDuff Ave. (SR 129) and King St. (WB)	I10_BL_WB	733+00.00	Sag	-3.0 to 3.0	208.33	1250
24	Bridge over King St. (WB)	I10_BL_WB	745+95.00	Crest	3.0 to -1.8	104.17	500
25	Between King St. and CSX Railroad (WB)	I10_BL_WB	752+04.72	Sag	-1.8 to 3.0	72.92	350
26	Bridge over CSX Railroad	I10_CL2	658+50.00	Crest	3.0 to -1.8	104.17	500
27	Bridge over Stockton St. (EB)	I10_CL2	664+50.00	Crest	-1.8 to -3.0	250.00	300
28	Bridge over Stockton St. (WB)	I10_CL2	665+55.00	Crest	0.6 to -3.4	150.00	600

Table 2-5. Existing Bridge Clearances – I-10 (SR 8)

No.	Bridge Number	Bridge Location	Existing Clearance
1	720186	Lane Ave. (SR 103) (WB)	14' 4"
2	720307	Lane Ave. (SR 103) (EB)	14' 4"
3	720187	Ellis Rd. (WB)	14' 3"
4	720308	Ellis Rd. (EB)	14' 3"
5	720309	Cassat Ave. (SR 111)	14' 10"
6	720310	Edgewood Ave.	15' 3"
7	720311	Luna St.	14" 3"
8	720312	Nelson St.	14' 4"
9	720313	McDuff Ave. (SR 129)	14' 5"
10	720193	Roosevelt Blvd. (US 17)	14' 10"
11	720194	King St. (WB)	14' 3"
12	720314	King St. (EB)	14' 3"
13	720195	CSX Railroad	21' 6"
14	720643	Stockton St. (WB)	18' 0"
15	720196	Stockton St. (EB)	14' 7"

between I-295 and I-95 do not meet current FDOT criteria for vertical clearances. Horizontal clearances under the structures meet current FDOT criteria or have had protection devices, such as barrier walls or guardrails installed, except for the bridge over King Street. King Street is an urban curb and gutter facility and the I-10 (SR 8) bridge piers are located approximately 15-feet from the back of the curb. Sufficiency ratings for the structures analyzed range between 70-98 percent.

2.7 Bicycle and Pedestrian Facilities

There are no bicycle and/or pedestrian facilities along I-10 (SR 8) within the project area as I-10 (SR 8) is a limited access freeway facility.

Sidewalks are located to the east and west side of the roadway along several arterial interchanges within the project limits. These arterials include Lane Avenue (SR 103), Cassat Avenue (SR 111), Luna Street, McDuff Avenue (SR 129) and Stockton Street. There is a pedestrian underpass tunnel bridged over by I-10 (SR 8) located between Luna Street and McDuff Avenue (SR 129) interchanges along Day Avenue.

Bike facilities are not present along any of the above arterial roadways.

2.8 Intersection Layout and Traffic Control

There are five (5) service interchanges (Lane Avenue (SR 103), Cassat Avenue (SR 111), Luna Street, McDuff Avenue (SR 129) and Stockton Street) and three (3) system-to-system interchanges (I-295, Roosevelt Boulevard (US 17) and I-95) within the project limits. The intersection layout and the traffic control type for the five (5) service interchanges are provided in Concept Plans (**Appendix A**).

2.9 Design and Posted Speeds

The posted speed limit along I-10 (SR 8) between I-295 and Roosevelt Boulevard (US 17) is 55 mph and is 50 mph between Roosevelt Boulevard (US 17) and I-95. The design speed is 5 mph higher than the posted speed limit.

2.10 Lighting

Existing lighting within the project area includes conventional pole lighting along the north and south side of I-10 (SR 8) extending from I-295 to Ellis Road. From Ellis Road to west of Roosevelt Boulevard (US 17), the pole lighting shifts to the median and is mounted on the barrier wall present along the median on I-10 (SR 8). From west of Roosevelt Boulevard (US 17) to I-95, the pole lighting is present on both sides of the roadway (in the median and to the north and south of I-10 (SR8)). Conventional pole lighting is located along the outside shoulder of the on- and off-ramps from arterial roadways to/from I-10 (SR 8). Roadway lighting within the limited access ROW and along the arterial interchanges are maintained by FDOT.

2.11 Railroad Crossing

The CSX railroad running north to south through the project area is located immediately adjacent to and on the west side of the Stockton Street interchange on I-10 (SR 8). I-10 (SR 8) crosses over this railroad via an overpass Bridge # 720195. The length of the railroad extends to the north and south beyond the project area boundaries and the ROW is approximately 100 feet in width.

2.12 Soils

An inventory of the existing soils along the I-10 (SR 8) study area was obtained from the U.S. Department of Agriculture (USDA) National Resources Conservation Service (NRCS) Soil Survey of Duval County, Florida (19xx). The primary soil types within the project area are presented in **Table 2-6** and shown in **Figure 2-3**.

Table 2-6. Existing Major Soil Types

Soil Type	Map Unit No.	Hydric	Hydrologic Group	Slope	Drainage Class
Arents	7	No	A	---	Somewhat Poorly Drained
Mascotte Fine Sand	38	Yes	C/D	0 – 2 Percent Slopes	Poorly Drained
Pelham Fine Sand	51	No	B/D	0 – 2 Percent Slopes	Poorly Drained
Pelham-Urban Land Complex	74	Unranked	---	0 – 2 Percent Slopes	---
Surrency Loamy Fine Sand, Frequently Flooded	67	Yes	B/D	0 – 2 Percent Slopes	Very Poorly Drained
Surrency Loamy Fine Sand - Depressional	66	Yes	B/D	0 – 2 Percent Slopes	Very Poorly Drained
Urban Land	69	Unranked	---	---	---
Urban Land-Hurricane-Albany Complex	75	Unranked	---	0 – 5 Percent Slopes	---
Urban Land-Leon-Boulogne Complex	71	Unranked	---	0 – 2 Percent Slopes	---
Urban Land-Mascotte-Sapelo Complex	73	Unranked	---	0 – 2 Percent Slopes	---
Urban Land-Ortega-Kershaw Complex	72	Unranked	---	0 – 8 Percent Slopes	---
Yonges Fine Sandy Loam	78	Yes	C/D	0 – 2 Percent Slopes	Poorly Drained

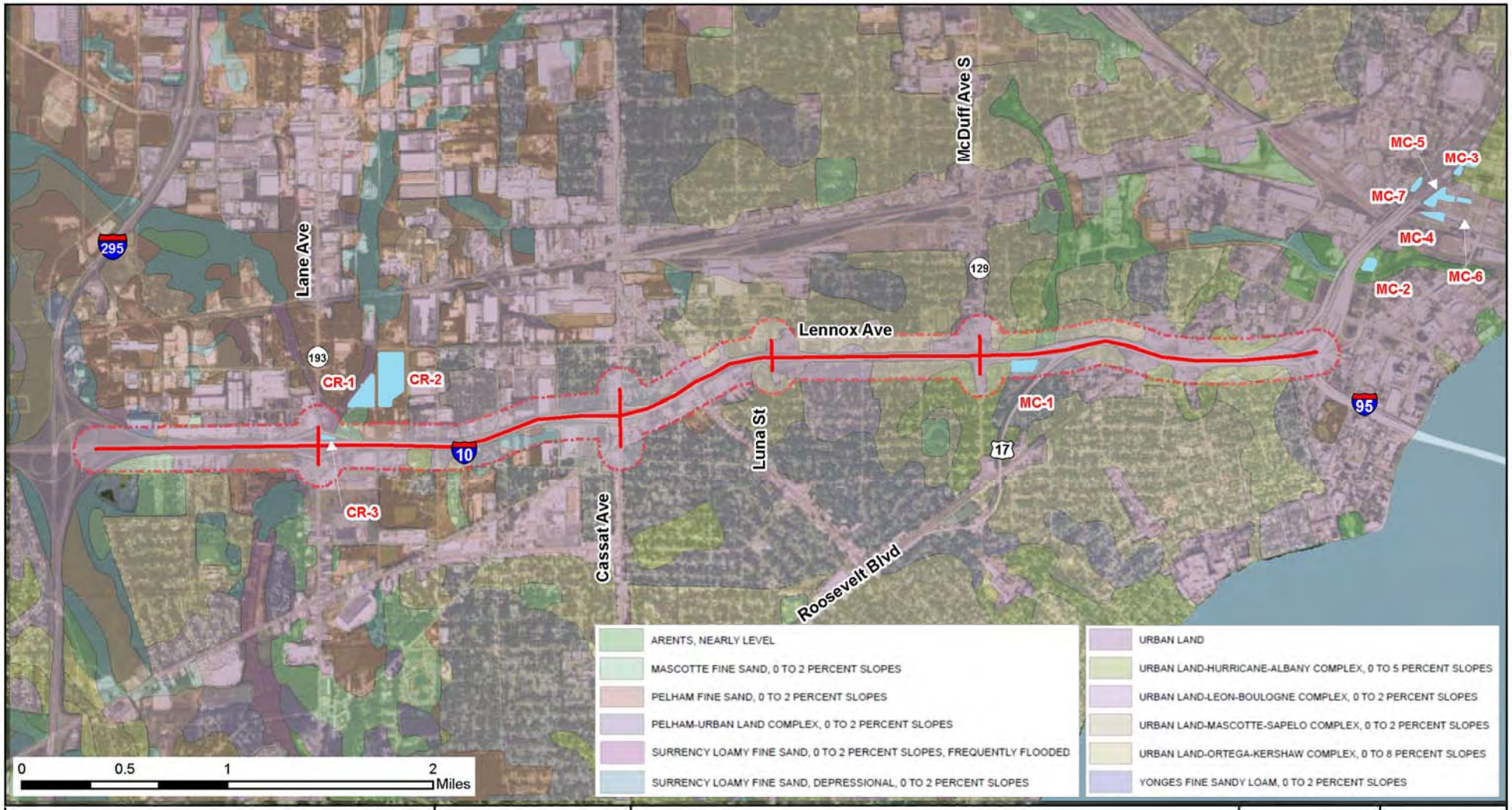
Source: Florida Geographic Data Library (FGDL), NRCS Soils

2.13 Drainage

The project limits are located within the jurisdictional boundary of the St. Johns River Water Management District (SJRWMD). Receiving waters within the project limits include Cedar River and McCoy Creek. The project limits within the Cedar River Basin extend from the beginning of the project to approximately Luna Street at station 215+00. The remaining project limits, 215+00 to the end of project, fall within the McCoy Creek Basin. Runoff from the project corridor is mostly collected via roadside swales and routed to various outfalls along the alignment before reaching the receiving water bodies, with a majority of this runoff being untreated.

2.14 Existing Cross Drains

Preliminary surveys and field reviews show that there are a few existing cross drains along the project corridor between I-295 and Cassat Avenue (SR 111). Past Cassat Avenue (SR 111) no existing cross drains are present along I-10 (SR 8) till I-95.



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EXISTING SOIL TYPES

Project Area
500 ft. Buffer
Potential Ponds
See Additional Legend

N

FIGURE **2-3**

2.15 Utilities

Existing utilities within the project area are described in **Table 2-7** and include power lines, underground fiber optic cable, water distribution, sanitary sewer, and gas distribution. It is anticipated based on location and depth, utility relocations may be required.

Table 2-7. Existing Utility Agencies/Owners

Utility Agency/Owner	Facilities
Jacksonville Electric Authority (JEA)	Water, Sewer and Electric
JEA-WSBU	Water and Sewer
FDOT	ITS, Buried Electric, Traffic Signals
TECO Peoples Gas	Gas Main
Comcast	Fiber Optic Cable, Cable TV
AT&T	Fiber Optic Cable, Buried Telephone Cables
Level 3 Communications	Fiber Optic Cable

Most of the utilities are located along the arterial interchanges with I-10 (SR 8) (Lane Avenue (SR 103), Cassat Avenue (SR 111), Luna Street, McDuff Avenue (SR 129), and Stockton Street), the exception of FDOT fiber optic communication and ITS devices which run along I-10 (SR 8) within the project limits.

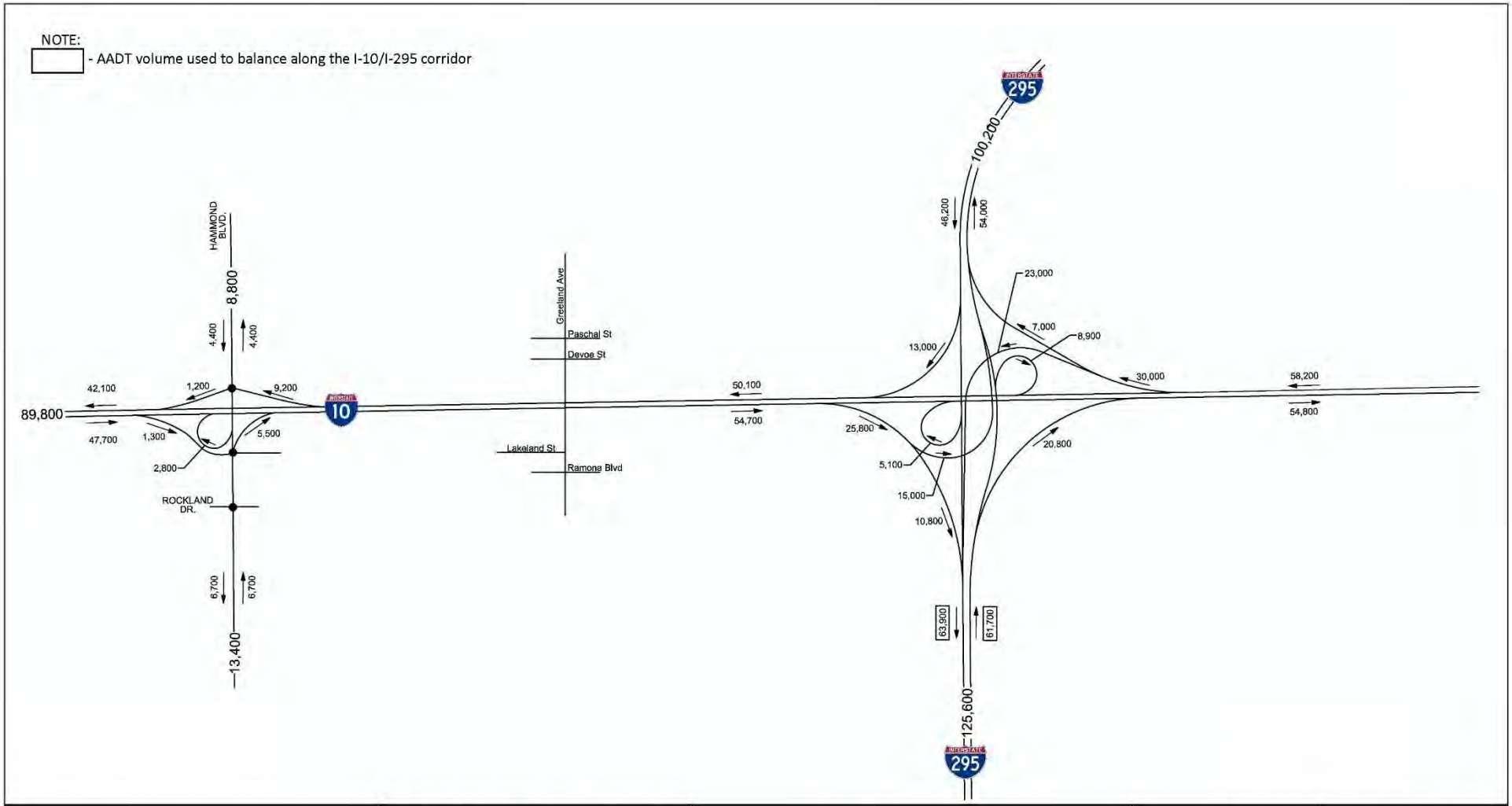
2.16 Traffic Data

The information presented in this section is a summary of the *Design Traffic Memorandum for I-10 (SR 8) from I-295 to I-95 Capacity Improvement PD&E Study Report* **(Appendix B)**. Traffic data was collected to evaluate the 2016 existing conditions and to provide a basis for future traffic analysis. The traffic counts were performed during typical weekdays (Tuesday through Thursday) from May 3, 2016 through May 5, 2016, October 26, 2016 through October 27, 2016 and November 2, 2016 at arterials, interchange ramps and freeway segments within the project study limits. For each intersection, the traffic data collection effort consisted of 48-hour approach/departure machine counts for all approaches and 8-hour intersection Turning Movement Counts (TMCs). The 8-hour TMCs were performed during the AM peak period (4 hours, from 6:00 AM to 10:00 AM) and the PM peak period (4 hours, from 3:00 PM to 7:00PM).

The approved *Design Traffic Memorandum* that summarizes the Existing Year 2016 and future demand traffic projections for Open Year (2025) and Design Year (2045) are shown in Figures 2-4 through 2-18 and provided in **Appendix B**.

2.17 Interstate Access Requests and Project Traffic Analysis Report

FDOT completed an Interchange Operational Analysis Report (IOAR) for the I-10/I-95 Operational Improvements (Fuller Warren) project that was approved in 2016. The area of influence for this project overlapped the I-10 (SR 8) from I-295 to I-95 PD&E project to the east. The I-10 (SR 8) from I-295 to I-95 PD&E project proposed to enhance the capacity along I-10 (SR 8) and improving the interchanges near Lane Avenue (SR 103) and Cassat Avenue (SR 111). The Interstate Access Request anticipated for this project include two (2) IOARs for the interchange improvements proposed along Lane Avenue (SR 103) and Cassat Avenue (SR 111).



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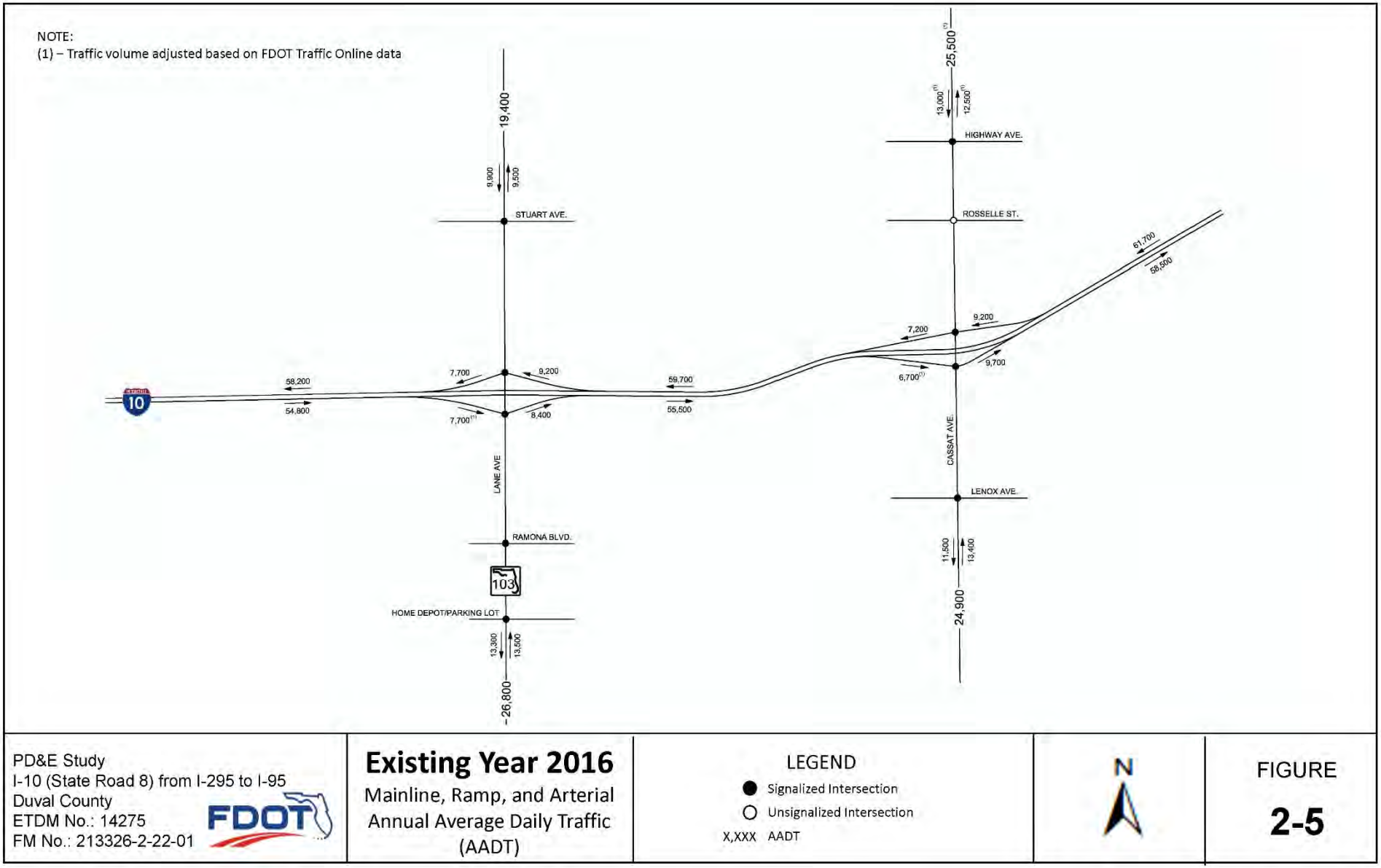
Existing Year 2016
Mainline, Ramp, and Arterial
Annual Average Daily Traffic
(AADT)

LEGEND
- Signalized Intersection
- Unsignalized Intersection
- X,XXX AADT

N

FIGURE
2-4



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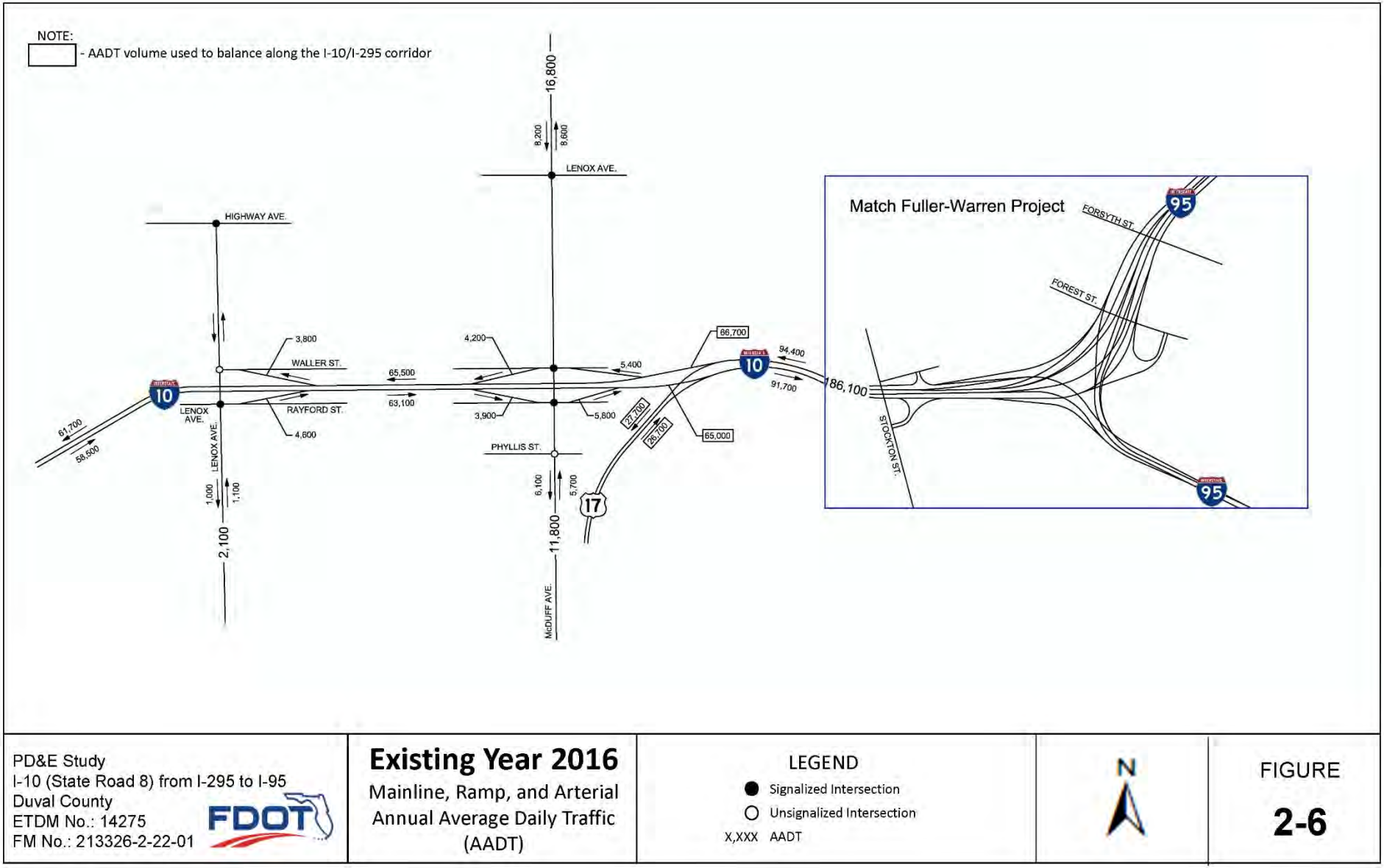
Existing Year 2016
Mainline, Ramp, and Arterial
Annual Average Daily Traffic
(AADT)

LEGEND
- Signalized Intersection
- Unsignalized Intersection

X,XXX AADT

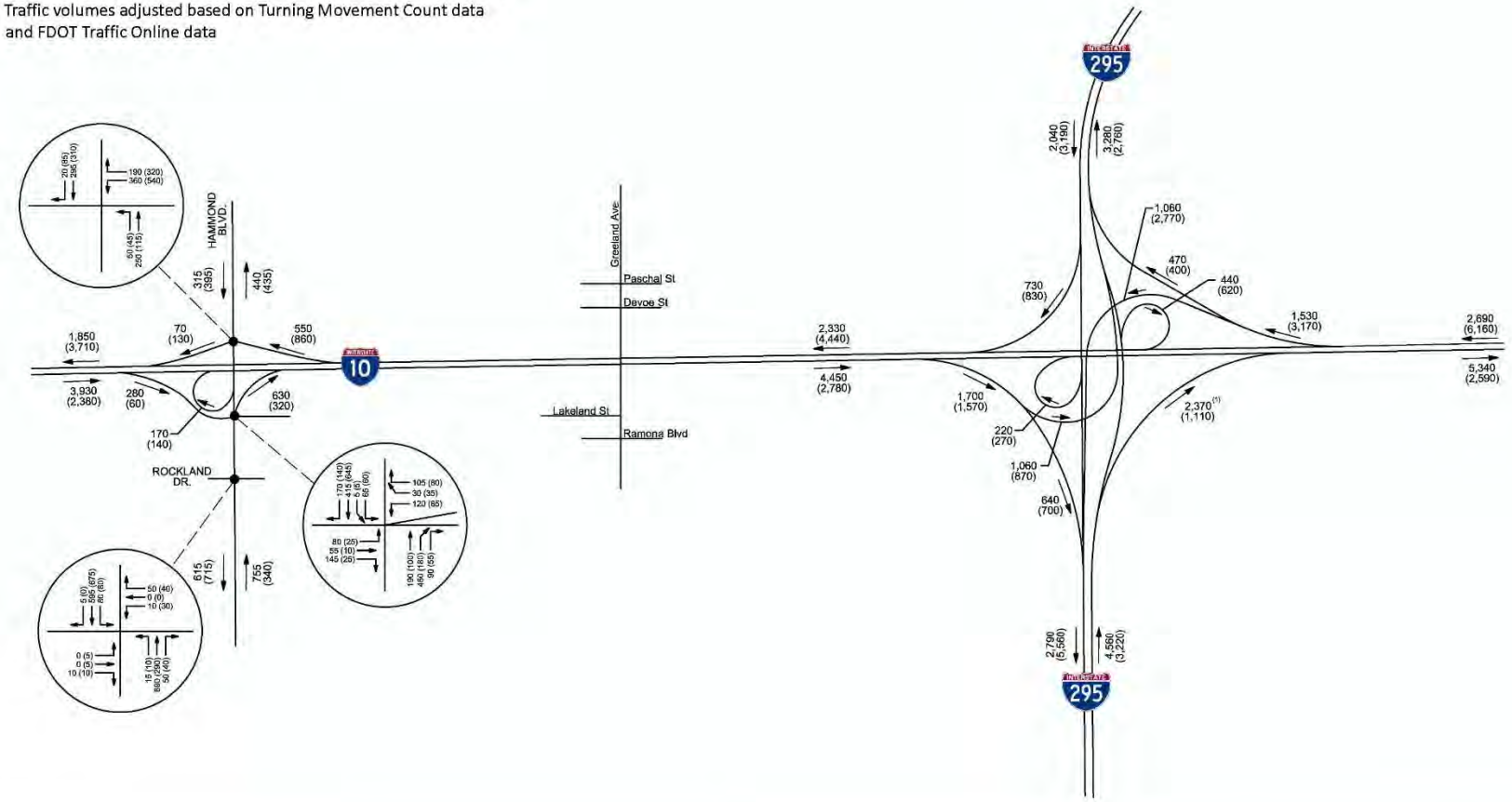
N

FIGURE
2-5



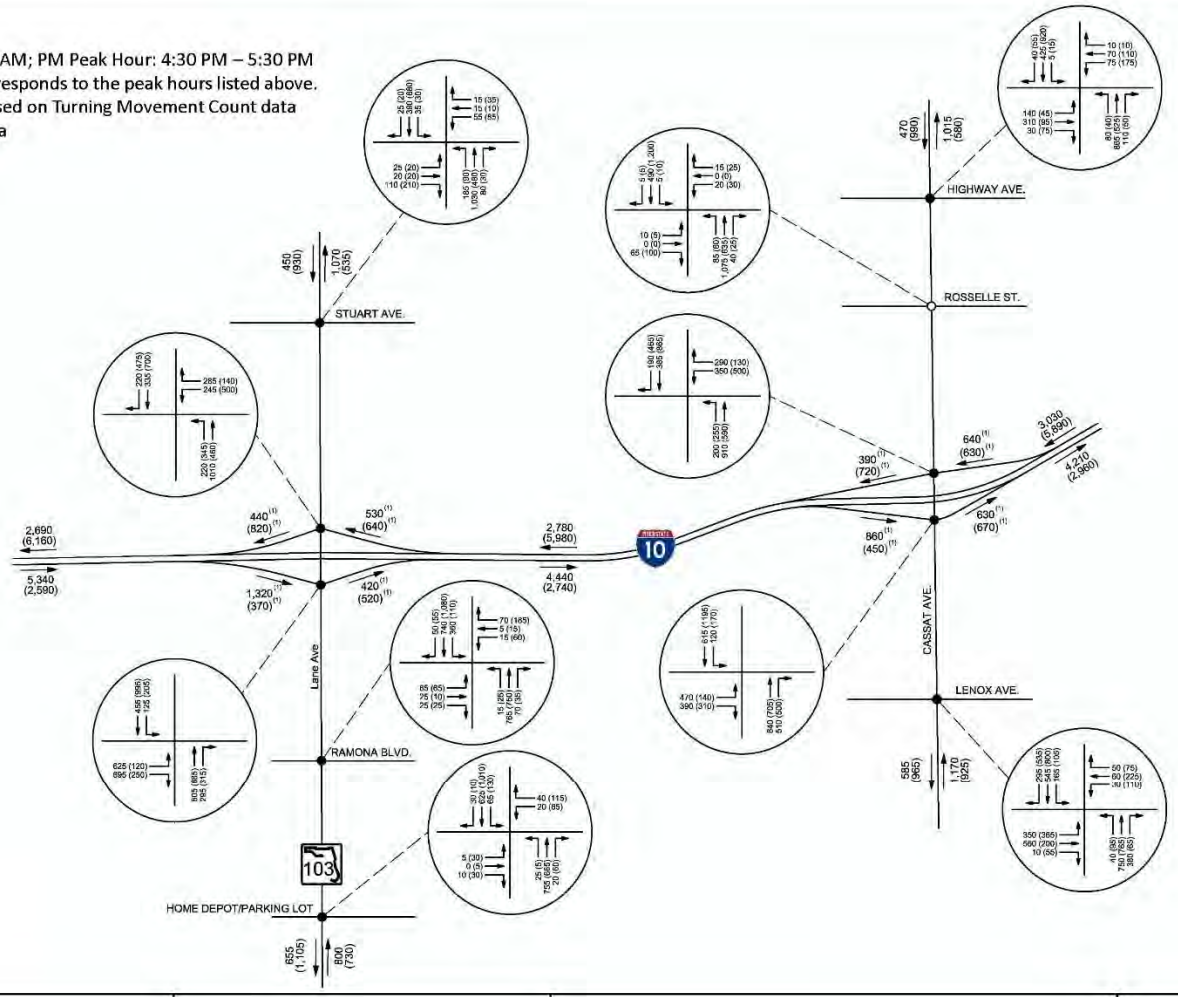
PD&E Study I-10 (State Road 8) from I-295 to I-95 Duval County ETDM No.: 14275 FM No.: 213326-2-22-01	**Existing Year 2016** Mainline, Ramp, and Arterial Annual Average Daily Traffic (AADT)	LEGEND ● Signalized Intersection ○ Unsignalized Intersection X,XXX AADT	N	FIGURE **2-6**

NOTE:
AM Peak Hour: 7:00 AM – 8:00 AM; PM Peak Hour: 4:30 PM – 5:30 PM
All ramp traffic information corresponds to the peak hours listed above.
(1) Traffic volumes adjusted based on Turning Movement Count data and FDOT Traffic Online data



PD&E Study I-10 (State Road 8) from I-295 to I-95 Duval County ETDM No.: 14275 FM No.: 213326-2-22-01	**Existing Year 2016** Mainline, Ramp, and Arterial Directional Design Hourly Volume (DDHV)	LEGEND ● Signalized Intersection ○ Unsignalized Intersection XX (XX) AM (PM) Mainline/Ramp Volume	N	FIGURE **2-7**

NOTE:
AM Peak Hour: 7:00 AM – 8:00 AM; PM Peak Hour: 4:30 PM – 5:30 PM
All ramp traffic information corresponds to the peak hours listed above.
(1) Traffic volumes adjusted based on Turning Movement Count data and FDOT Traffic Online data



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Existing Year 2016
Mainline, Ramp, and Arterial Directional Design Hourly Volume (DDHV)

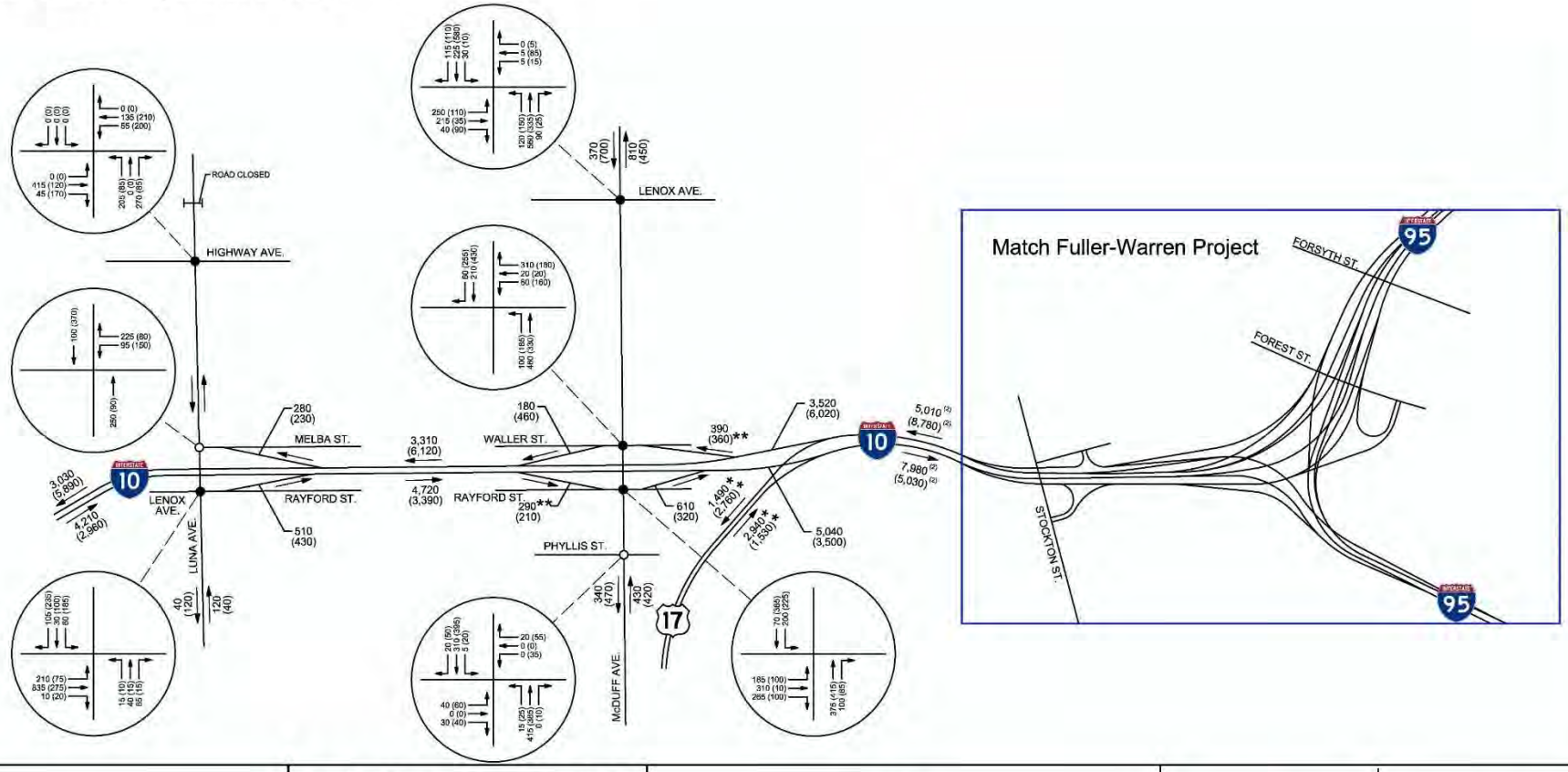
LEGEND
- Signalized Intersection
- Unsignalized Intersection

XX (XX) AM (PM) Mainline/Ramp Volume

N

FIGURE
2-8

NOTE:
AM Peak Hour: 7:00 AM – 8:00 AM; PM Peak Hour: 4:30 PM – 5:30 PM
All ramp traffic information corresponds to the peak hours listed above.
(2) Traffic volumes derived from a 1.00% growth rate to Fuller-Warren IOAR Year 20103 volume data
* Ramp volumes matched with Fuller-Warren IOAR data as Year 2016 counts are similar or lower
**Volume adjusted based on Turning Movement Count data



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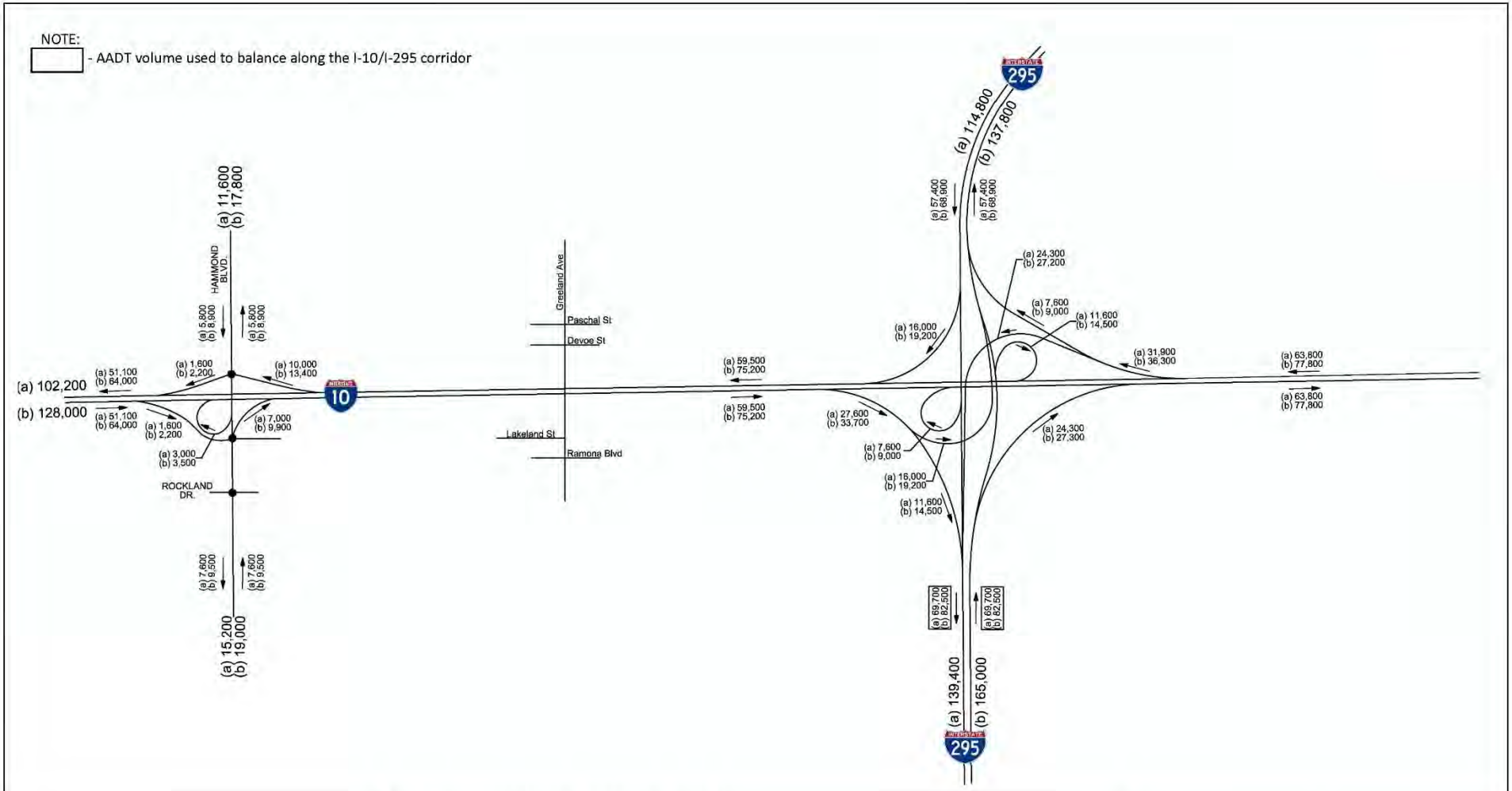
Existing Year 2016
Mainline, Ramp, and Arterial Directional Design Hourly Volume (DDHV)

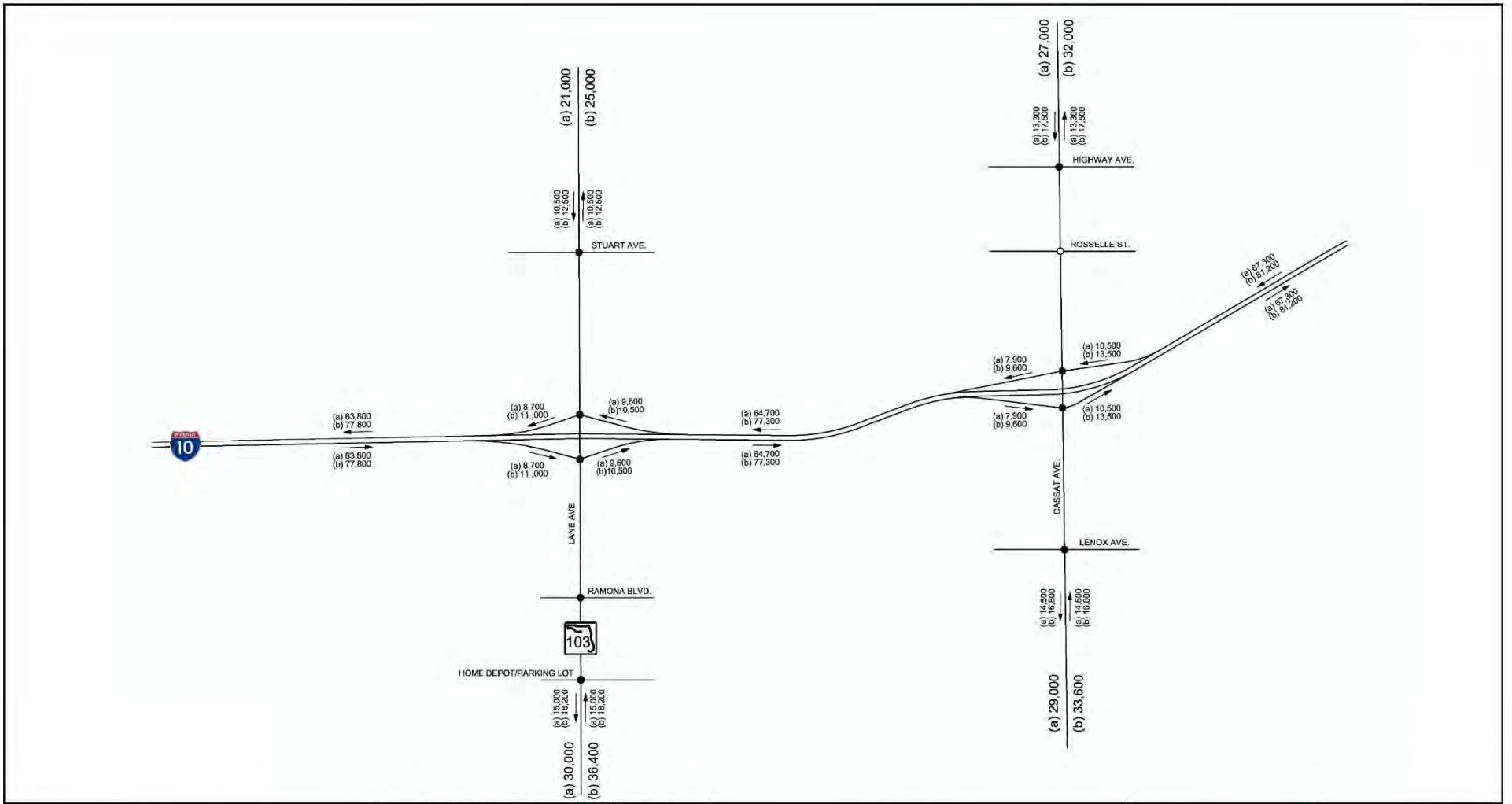
LEGEND
● Signalized Intersection
○ Unsignalized Intersection
XX (XX) AM (PM) Mainline/Ramp Volume

N

FIGURE
2-9



PD&E Study I-10 (State Road 8) from I-295 to I-95 Duval County ETDM No.: 14275 FM No.: 213326-2-22-01	**Opening Year 2025 and Design Year 2045** Mainline, Ramp, and Arterial Annual Average Daily Traffic (AADT)	LEGEND ● Signalized Intersection ○ Unsignalized Intersection (a) X,XXX Opening Year 2025 AADT (b) X,XXX Design Year 2045 AADT	N	FIGURE **2-10**



PD&E Study
I-10 (State Road 8) from I-295 to I-95
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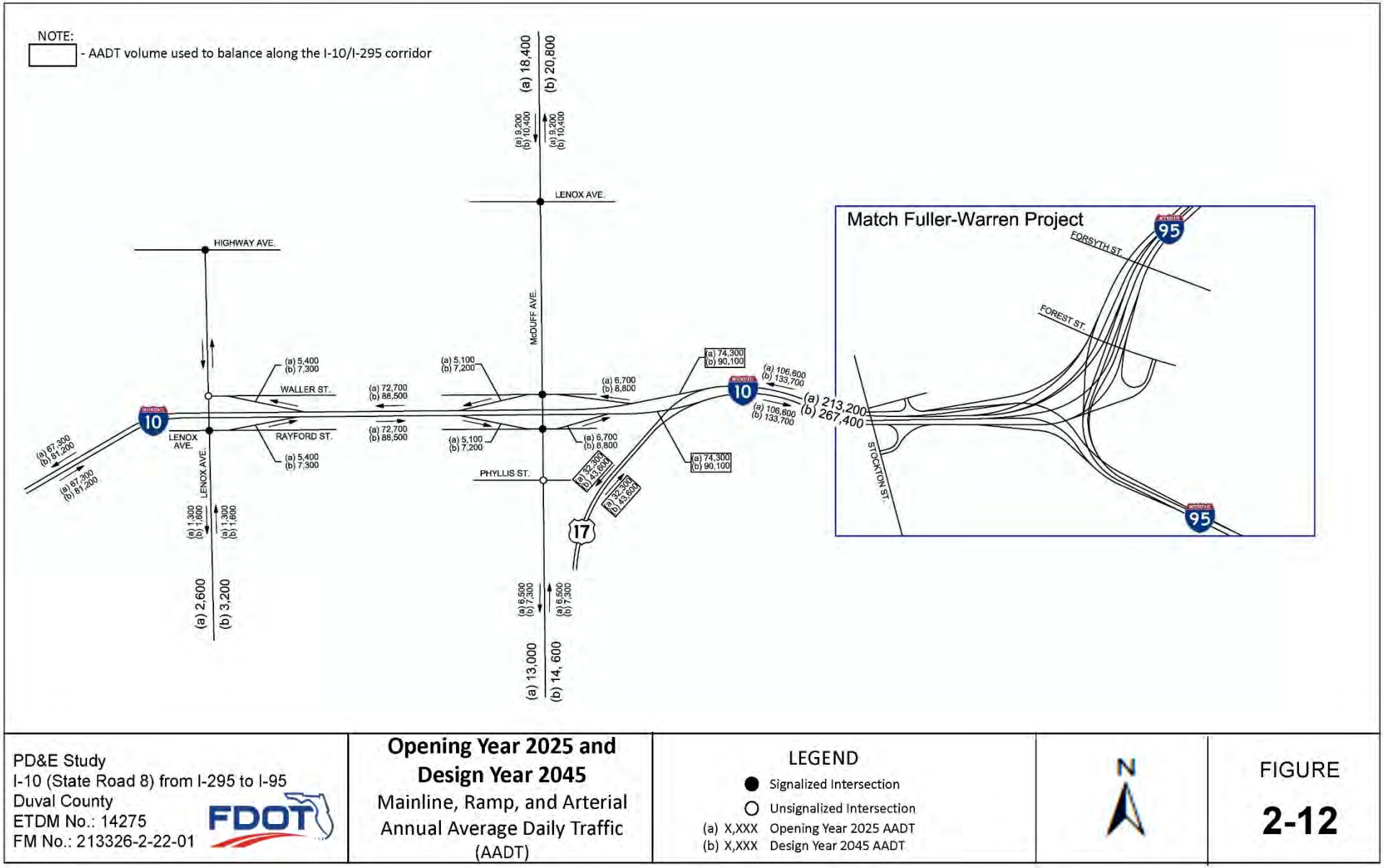
Opening Year 2025 and Design Year 2045
Mainline, Ramp, and Arterial Annual Average Daily Traffic (AADT)

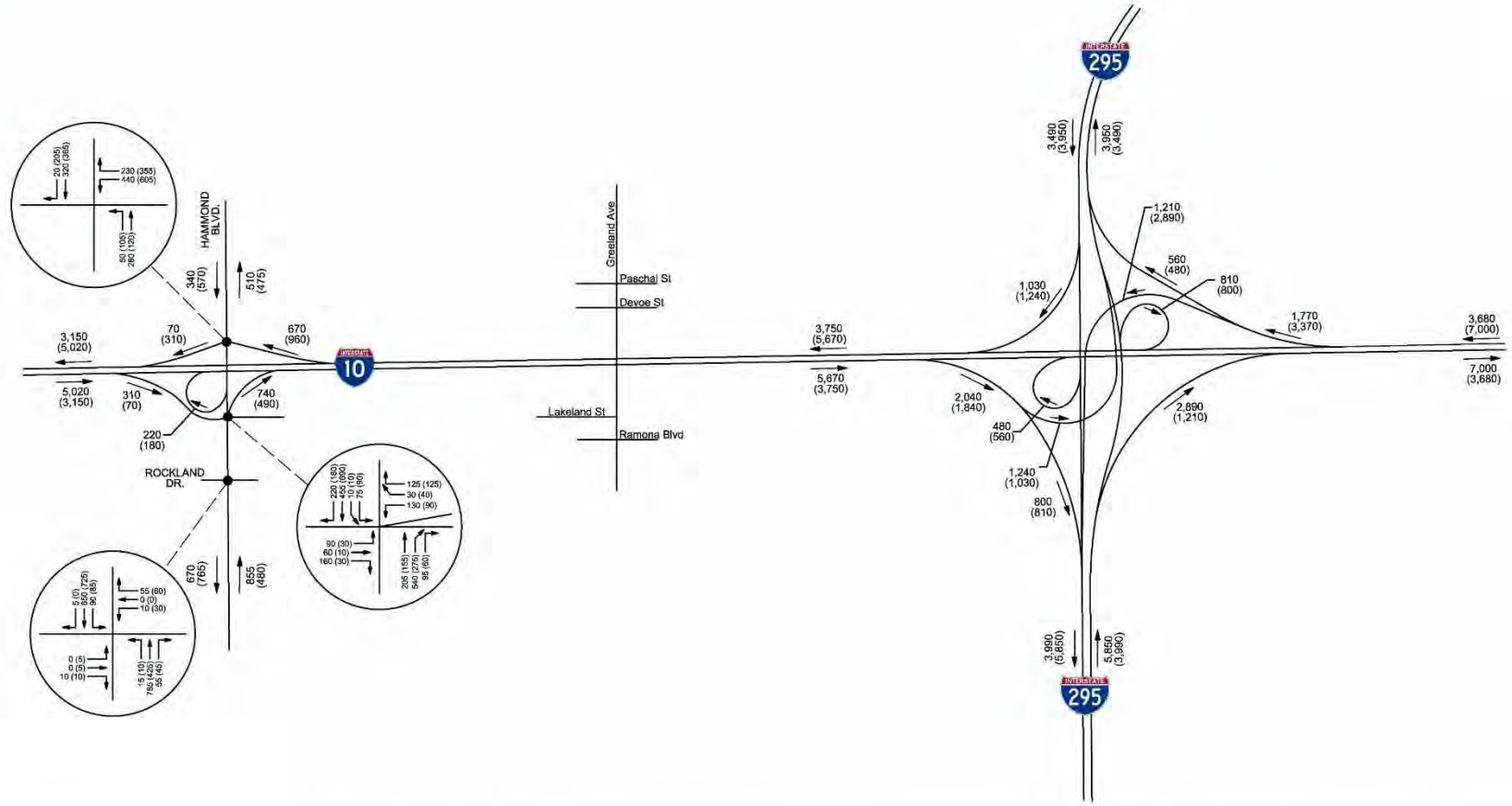
LEGEND
- Signalized Intersection
- Unsignalized Intersection
- (a) X,XXX Opening Year 2025 AADT
- (b) X,XXX Design Year 2045 AADT

N

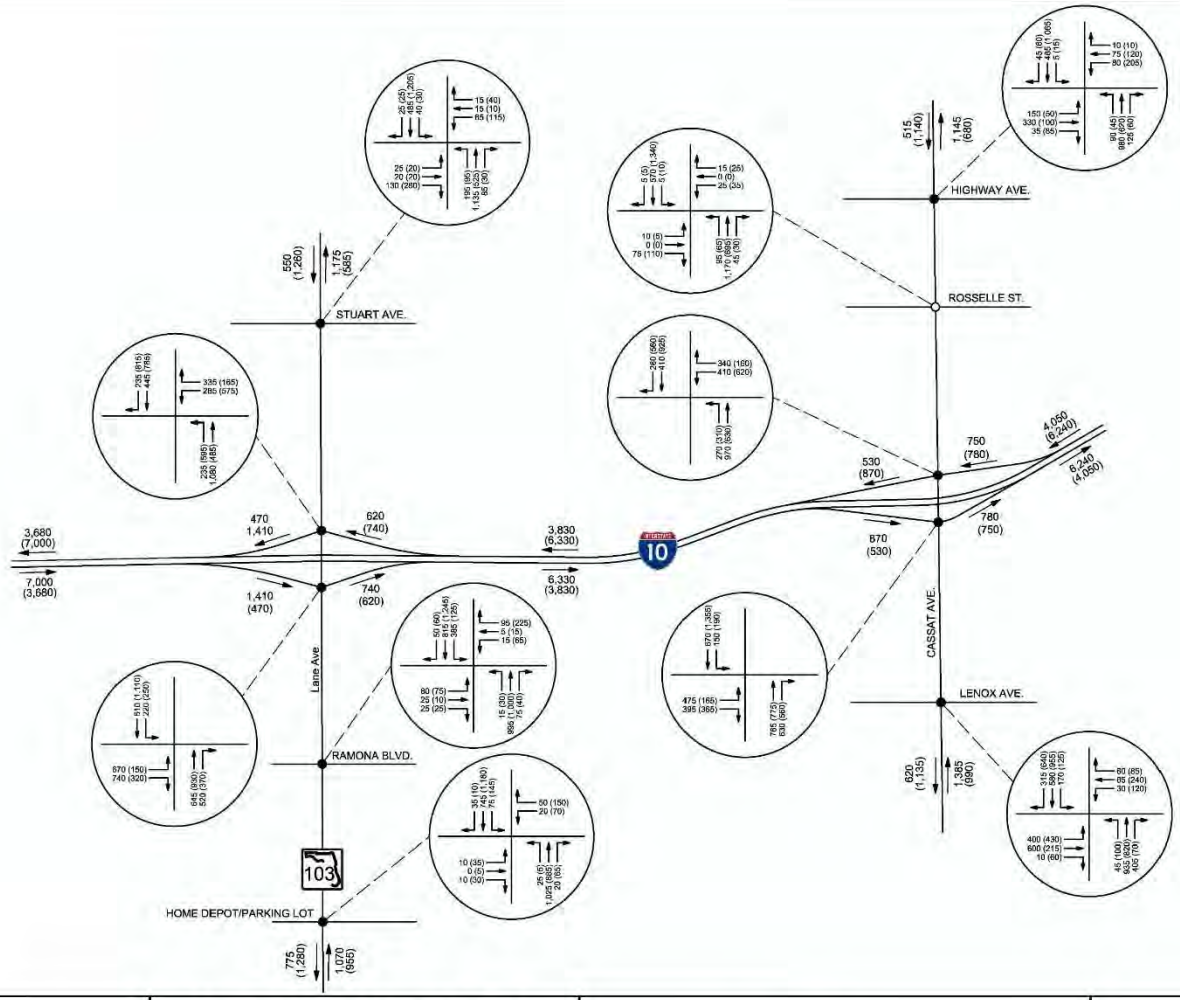
FIGURE
2-11



PD&E Study I-10 (State Road 8) from I-295 to I-95 Duval County ETDM No.: 14275 FM No.: 213326-2-22-01	**Opening Year 2025 and Design Year 2045** Mainline, Ramp, and Arterial Annual Average Daily Traffic (AADT)	LEGEND ● Signalized Intersection ○ Unsignalized Intersection (a) X,XXX Opening Year 2025 AADT (b) X,XXX Design Year 2045 AADT	N	FIGURE **2-12**



PD&E Study I-10 (State Road 8) from I-295 to I-95 Duval County ETDM No.: 14275 FM No.: 213326-2-22-01	**Opening Year 2025** Mainline, Ramp, and Arterial Directional Design Hourly Volume (DDHV)	LEGEND ● Signalized Intersection ○ Unsignalized Intersection XX (XX) AM (PM) Mainline/Ramp Volume	N	FIGURE **2-13**



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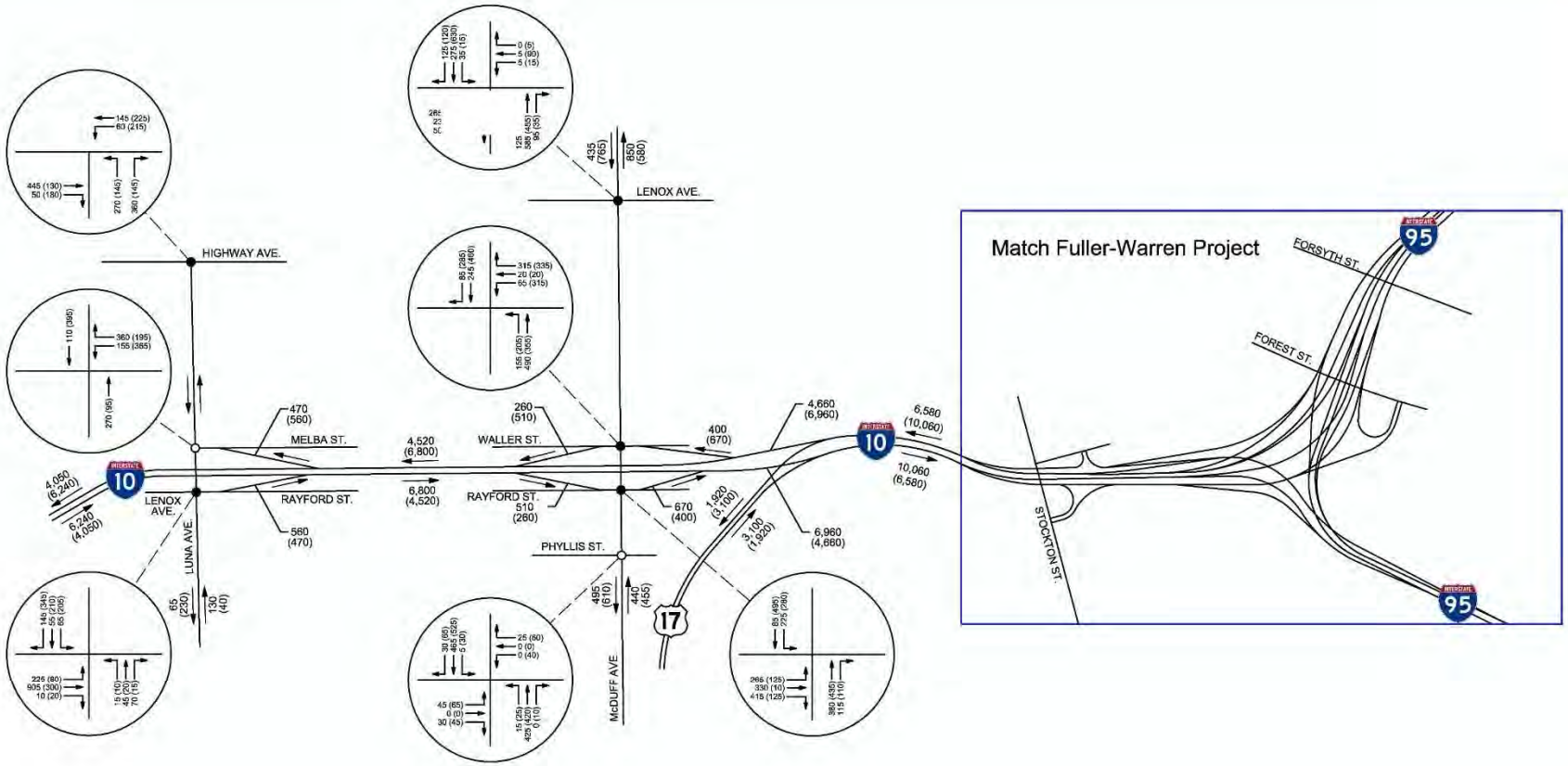
Mainline, Ramp, and Arterial Directional Design Hourly Volume (DDHV)

LEGEND
- Signalized Intersection
- Unsignalized Intersection

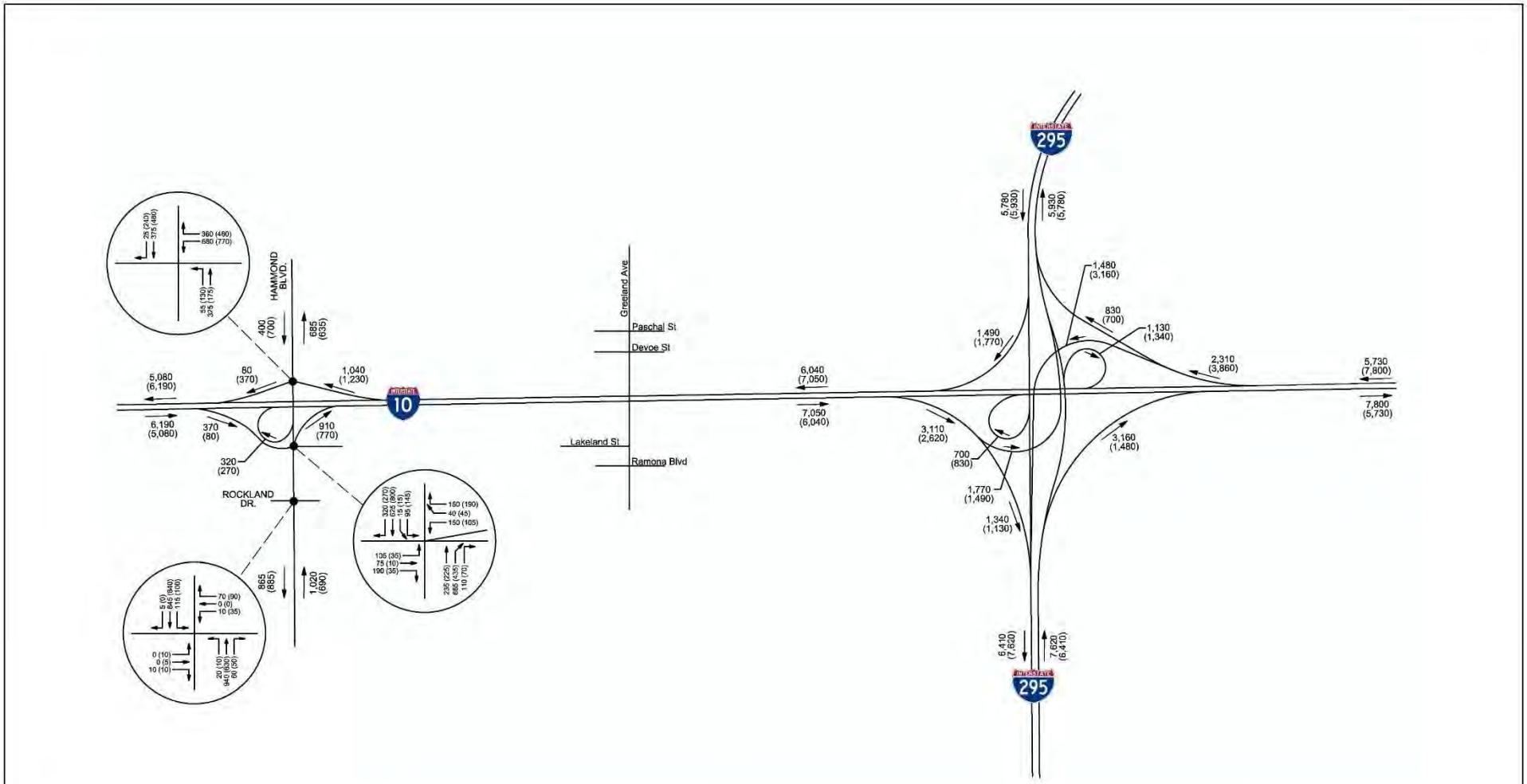
XX (XX) AM (PM) Mainline/Ramp Volume

N

FIGURE
2-14



PD&E Study I-10 (State Road 8) from I-295 to I-95 Duval County ETDM No.: 14275 FM No.: 213326-2-22-01	**Opening Year 2025** Mainline, Ramp, and Arterial Directional Design Hourly Volume (DDHV)	LEGEND ● Signalized Intersection ○ Unsignalized Intersection XX (XX) AM (PM) Mainline/Ramp Volume	N	FIGURE **2-15**



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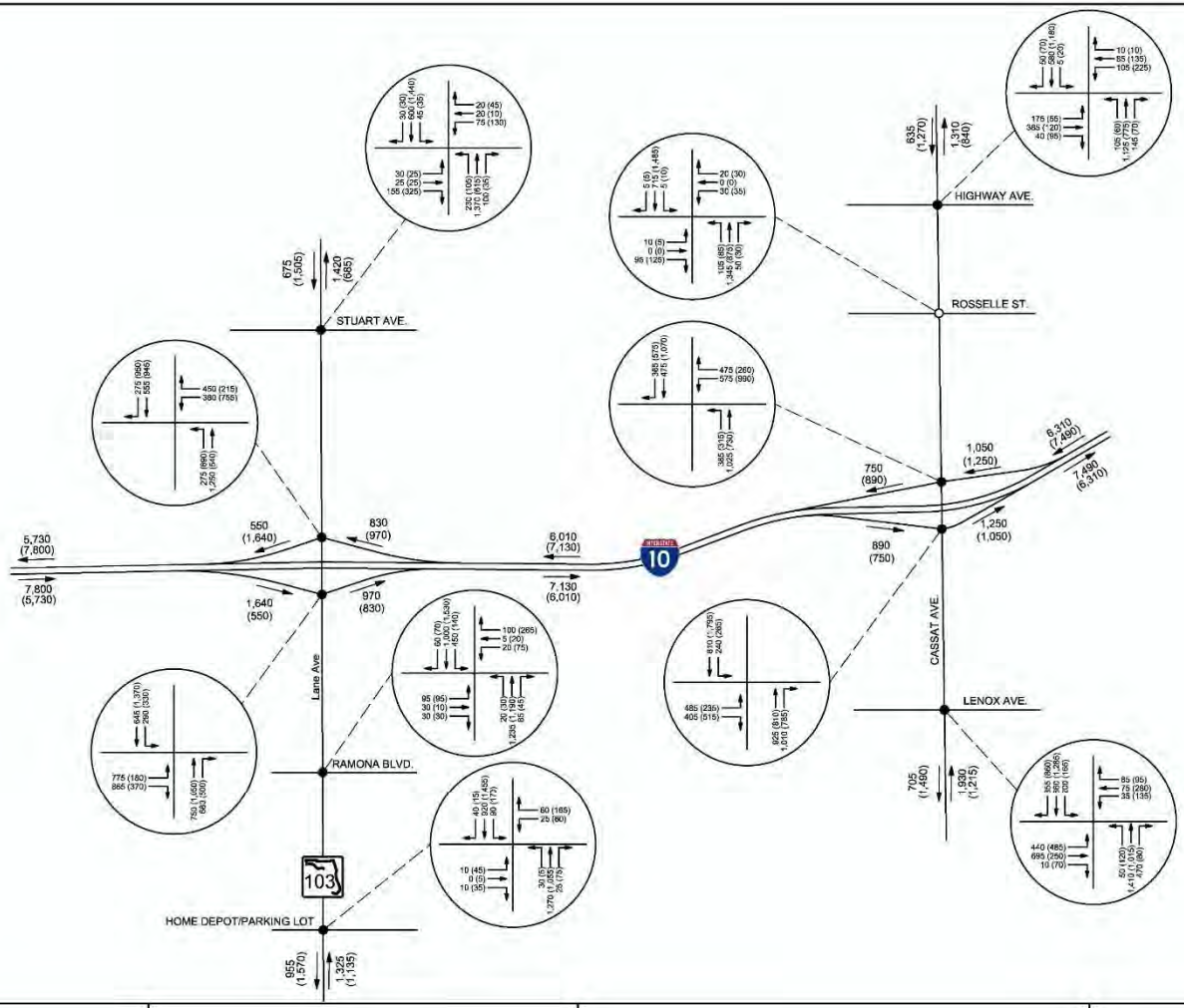
Design Year 2045
Mainline, Ramp, and Arterial
Directional Design Hourly Volume
(DDHV)

LEGEND
● Signalized Intersection
○ Unsignalized Intersection
XX (XX) AM (PM) Mainline/Ramp Volume

N

FIGURE
2-16



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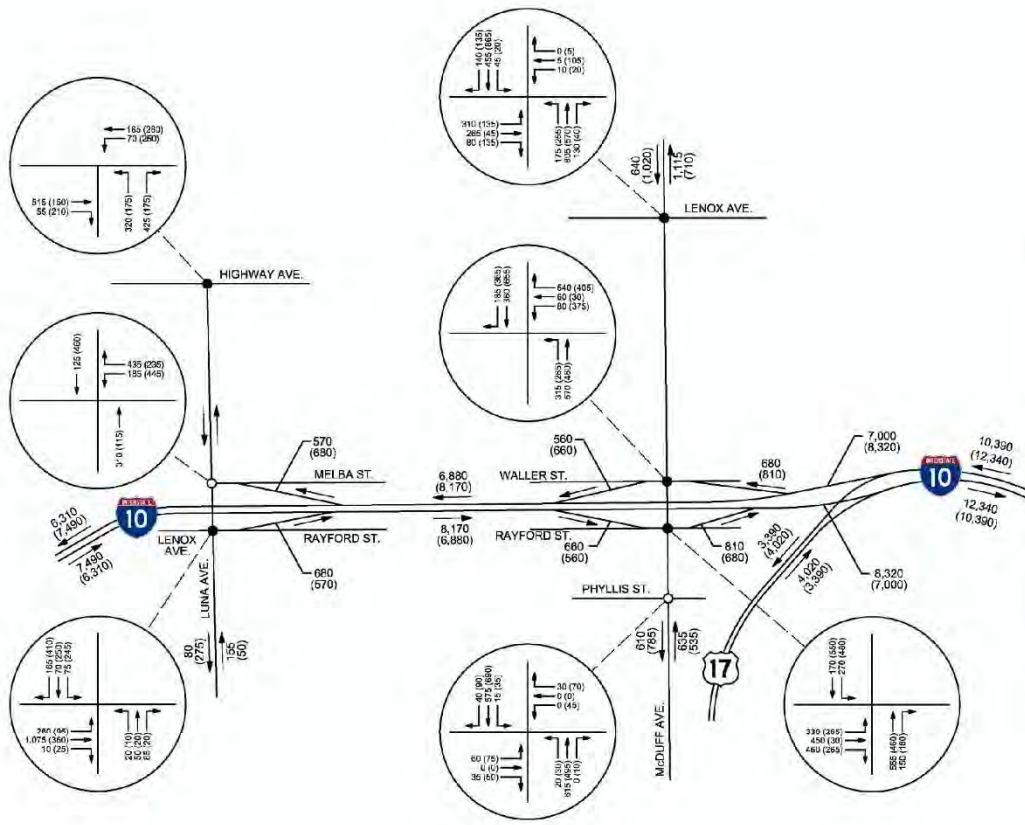
Design Year 2045
Mainline, Ramp, and Arterial
Directional Design Hourly Volume
(DDHV)

LEGEND
- Signalized Intersection
- Unsignalized Intersection

XX (XX) AM (PM) Mainline/Ramp Volume

N

FIGURE
2-17



PD&E Study I-10 (State Road 8) from I-295 to I-95 Duval County ETDM No.: 14275 FM No.: 213326-2-22-01	**Design Year 2045** Mainline, Ramp, and Arterial Directional Design Hourly Volume (DDHV)	LEGEND ● Signalized Intersection ○ Unsignalized Intersection XX (XX) AM (PM) Mainline/Ramp Volume	N	FIGURE **2-18**

Two IOARs were prepared for this project and were submitted to FDOT for approval for the project. These include:

- Lane Avenue (SR 103) Interchange Improvements IOAR
- Cassat Avenue (SR 111) Interchange Improvements IOAR

The two IOARs developed for this project are provided in **Appendix C**.

A Project Traffic Analysis Report (PTAR) was completed for this project and is provided in **Appendix D**. The PTAR documents the operations of I-10 (SR 8) from I-295 to I-95 using VISSIM analysis software under the Existing Year (2016), Open Year (2025) and Design Year (2045) traffic conditions. The purpose of the PTAR completed for this PD&E Study is to document the engineering and operational acceptability of the improvements proposed to I-10 (SR 8) from I-295 to I-95.

2.18 Operational Analysis

The Existing Year (2016) level of service conditions were evaluated for the road segments and intersections within the project study area. Traffic operational analysis were based on the network lane configurations and traffic volumes presented in the preceding sections of this report. LOS calculations for freeway segments (basic freeway, merge and diverge areas) and analyses of freeway weaving segments were performed using the VISSM Software. Existing signal timings were obtained from FDOT District 2 and were verified in the field. The findings of the intersection analysis are included in the Design Traffic Memorandum and PTAR (**Appendices B and D**).

2.19 Design Traffic Volume

2.19.1 Traffic Factors and Characteristics

The traffic factors used for this study area are summarized in **Table 2-8**. PHF is the Peak Hour Factor showing a measure of traffic demand fluctuation during the peak hours. The T_{24} factor is the percentage of heavy vehicles during a 24-hour period and the T_f factor is the percentage of heavy vehicles during the peak hour. MOCF is the model output conversion factor used to convert traffic volumes generated from NERPM-ABIV2 to Annual Average Daily Traffic (AADT). The K factor is the proportion of AADT occurring in the peak hour. The D factor is the proportion of Design Hourly Volume (DHV) occurring in the heavier direction (directional split).

Table 2-8. Summary of Traffic Factors

Roadway	PHF	T_{24} (%)	T_f (%)	MOCF	K (%)	D (%)
I-10 (SR 8)	0.94	4.08	2.04	0.96	8.5	54.3
I-295	0.94	12.43	6.22	0.96	8.5	54.3
Lane Avenue (SR 103)	0.90	1.75	0.86	0.98	8.5	54.3
Cassat Avenue (SR 111)	0.90	8.65	4.33	0.98	8.5	54.3
McDuff Avenue (SR 129)	0.90	2.25	1.13	0.98	8.5	54.3
All other roadways	0.90	1.75	0.86	0.98	8.5	54.3

Source: FDOT Traffic Information Online, Year 2015 Traffic Factors

2.19.2 Future Year Traffic Volumes

The NERPM-ABIV2 was used for the development of future year daily and peak hour traffic projections within the study area and for the development of the Design Traffic Memorandum (DTM) provided in **Appendix B**. The NERPM-ABIV2 model is based on the Florida Standard Urban Transportation Modeling Structure (FSTUMS) and is recognized by FDOT District Two, FHWA, and North Florida TPO as an acceptable travel demand forecasting tool.

Existing Year (2016) traffic counts were compiled and balanced along the study area. Data was adjusted from application of seasonal and axle correction factors where applicable. Peak hour duration and direction of travel was determined for AM and PM conditions. All existing traffic data was balanced for mainline, ramps and intersections. Intersection data included the ramp terminal locations and an adjacent signalized intersection per guidelines listed in the FHWA's Traffic Analysis Toolbox.

Future traffic forecasts were based on NERPM-ABIV2 and area historical growth rates. The model base and horizon years are 2010 and 2040, respectively. The future year Build traffic forecasts developed using the NERPM-ABIV2 included the widening of I-10 (SR 8) with an additional two general purpose lanes in the eastbound and westbound, direction within the project study area. Future year 2040 No Build and Build projections were developed and were found to have similar volume trends. Thus, for the purposes of analyses, Build and No Build travel demands were maintained similar for the Open and Design Years.

The traffic forecasting methodology used for this project is based on Existing Year (2016) AADT and 2010 and 2040 NERPM-ABIV2 model run AADT volumes. The 2016 NERPM-ABIV2 model AADT volumes were interpolated using the 2010 and 2040 NERPM-ABIV2 model AADT volumes. The difference of the field counted 2016 AADT and NERPM-ABIV2 interpolated 2016 forecasted AADT from model volumes was calculated. Next, the recommended 2040 AADT volumes were calculated by applying this difference to the 2040 NERPM-ABIV2 model AADT volumes. For all roadway links, the 2016 and 2040 AADT were compared and a minimum compounded growth rate of 0.74 percent was adopted for this study based on NERPM-ABIV2 and historical growth rates. For roadway segments where the NERPM-ABIV2 2040 model volumes were lower than the 2010 model volumes, or are not included in the NERPM-ABIV2 network, the future 2040 AADTs were calculated using the 2016 AADTs collected in the field and applying the 0.74 percent growth rate. Open Year (2025) AADT volumes were calculated by interpolation between final 2016 and 2040 AADT volumes. The Design Year (2045) AADT volumes were calculated by extrapolating the final 2040 AADT values with the 0.74 percent growth factor. The AADTs for Existing (2016), Open (2025), and Design (2045) Years were balanced.

Directional Design Hourly Volumes (DDHVs) were calculated by applying appropriate K and D factors, as identified in Table 2-7, to AADT projections. Traffic volumes were balanced by holding the mainline volumes and adding or subtracting ramp volumes. The DDHV turning movements were developed by applying existing turning percentages to the intersection approach DDHVs. The DDHVs were balanced and adjusted so the intersection turns balance with ramp traffic. The volumes were then balanced along the arterial. The traffic projections were checked for reasonableness with on-going or recently completed studies within the area and Florida Traffic Online to ensure consistency. The finalized AADT, DDHV, and turning movement information are provided in the DTM (**Appendix B**) prepared for this project.

2.20 Crash Data and Safety Analysis

Historical crash data for the project study area was obtained from SignalFour Analytics and FDOT Safety Office for the most recent five-year period, 2012 through 2016, along the I-10 (SR 8) mainline within the area of influence. This data

included the number of crashes, type, location, severity, and property damage and economic loss estimated for each crash. The crash data obtained is provided in **Appendix E**.

The study area for the I-10 (SR 8) from I-295 to I-95 PD&E study experienced 1,796 crashes from 2012 through 2016. Of these crashes, less than one percent resulted in a fatality, but 28 percent resulted in at least one injury. A summary of the crashes is provided in **Table 2-9**.

Table 2-9. I-10 (SR 8) Study Area Crash Summary

Road/Location	Year	Fatality	Injury	PDO*	Total
I-10 (SR 8) Mainline	2012	0	99	255	354
	2013	0	89	224	313
	2014	2	95	208	305
	2015	0	102	279	381
	2016	0	113	303	416
Total Study Area		**2**	**498**	**1,269**	**1,769**
		0.1%	**28.2%**	**71.7%**	**71.7%**

*Property Damage Only

Of the two fatalities that occurred within the study area, one reported alcohol as a contributing factor and occurred near the McDuff Avenue in the eastbound I-10 (SR 8) direction. The contributing cause for this crash was a head-on collision. The other fatality involved a rollover with a motorcycle. Dark, but lighted conditions were recorded for this fatal crash and none of the fatal crashes indicated rain as a factor.

The major crash types causing accidents were evaluated during the analysis period along the I-10 (SR 8) study area. The predominant crash type that occurred as rear-end collisions which was indicated for 53 percent of the total crashes. This may be attributed to the congested conditions along I-10 (SR 8) in this region. Sideswipes and off-road crashes are the crash types for 22 percent and 12 percent of the total crashes, respectively. This information is summarized in **Table 2-10**.

Table 2-10. I-10 (SR 8) Study Area Crash Type Summary

Crash Type	Number of Crashes					5-Year Total Crashes	Percent of Total	Mean Crashes Per Year
	Year							
	2012	2013	2014	2015	2016			
Rear-End	**187**	**165**	**170**	**201**	**220**	**943**	**53.3%**	**189**
Head On	0	1	3	1	1	6	0.3%	1
Angle	3	2	2	1	1	9	0.5%	2
Sideswipe	**65**	**74**	**60**	**90**	**104**	**393**	**22.2%**	**79**
Ran off Road	**52**	**34**	**35**	**40**	**51**	**212**	**12.0%**	**42**
Overturned/Rollover	3	3	5	1	2	14	0.8%	3
Other	36	26	22	37	31	152	8.6%	30
Unknown	8	8	8	10	6	40	2.3%	8
TOTAL CRASHES	354	313	305	381	416	1,769	100.0%	354

Of the total 1,769 crashes, 33 crashes involved a motorcycle rider. Common safety improvements like drainage and lighting enhancements are not recommended because 84.6% of the total crashes occurred when the pavement is under dry conditions and 74.2% of total crashes occurred during daylight.

Therefore, the crash data analysis conducted concludes that relieving congestion along I-10 (SR 8) would improvement the safety of the corridor by reducing the rear-end and sideswipe crashes by providing congestion free operations and more gaps for lane changing.

2.21 Transit Operations

No transit services are currently provided along I-10 (SR 8) between I-295 and Roosevelt Boulevard (US 17). The Jacksonville Transportation Authority (JTA) Route 201 utilizes I-10 (SR 8) between Roosevelt Boulevard (US 17) and I-95.

JTA operates Route 13 along Lane Avenue (SR 103) and Route 14 along Luna Street/Lenox Avenue within the I-10 (SR 8) project limits.

The transit routes within the study area will not be affected by the Build Alternative. Alternative travel modes are not anticipated to reduce the future demand along the I-10 (SR 8) corridor.

3. Project Design Standards

The design criteria used in this project is based on design parameters outlines in FDOT's *Roadway Plans Preparation Manual, 2017 edition.*

4. Alternatives Analysis

NEPA project development must consider a range of alternatives that meet the purpose and need of the project while balancing engineering requirements, impacts, and benefits. Project alternatives include the No-Build and Build Alternatives.

FDOT is committed to the practicable avoidance and minimization of potential impacts to the social and natural environment when considering approval of proposed transportation projects. The study of alternatives and the associated environmental consequences were evaluated according to NEPA and FDOT's PD&E process. This study process allows for coordination during the alternatives development process and thorough consideration of alternatives developed.

4.1 No-Build Alternative

NEPA requires that doing nothing to existing conditions be considered during the environmental review process. This alternative is designated as the No-Build Alternative, signifying that no new improvements or construction would take place. Although this alternative does not meet the purpose and need for the project, it will be considered serving as a baseline for comparison against other alternatives. The No-Build Alternative retains the existing roadway and interchange improvements and would not have any direct impacts to the physical, natural, and social environments, right-of-way, structures, or utilities.

4.2 Transportation System Management and Operations (TSM&O) Alternative

The TSM&O Alternative includes implementation of non-capacity improvements to the existing transportation network that improve traffic flow, manage congestion, and maximize highway operations. Intelligent transportation systems (ITS), multimodal applications, adjusting signal phasing and timing, and auxiliary lane additions are TSM&O instruments used to maximize transportation infrastructure utilization. Such improvements are often less costly and require little to no right-of-way compared to physical expansion of the transportation network.

TSM&O improvements alone would not adequately accommodate the future year traffic volumes within the project's area of influence. The TSM&O Alternative alone is not considered a viable alternative, however, the Build Alternative developed for this project will incorporate viable TSM&O improvements as part of its design.

4.3 Build Alternative

As part of the PD&E Study, evaluation of I-10 (SR 8) widening and interchange improvements for I-10 (SR 8) with Lane Avenue (SR 103) and I-10 (SR 8) with Cassat Avenue (SR 111) was completed.

A preliminary screening of the alternative was completed with respect to the purpose and need for the project, traffic operations, traffic safety, constructability, cost, ROW, environmental, and socio-economic impacts.

The following Build Alternative was fully evaluated and will incorporate TSM&O improvements and will be developed further as the project progresses.

- I-10 (SR 8) Mainline Widening

In addition, the project will seamlessly tie into the adjacent I-10/I-95 Operational Improvements (Fuller Warren) project (**Appendix F**).

4.3.1 I-10 (SR 8) Mainline Widening

This alternative includes proposed widening of the existing 6-lane roadway to a 10-lane roadway by the addition of two 12-foot general purpose lanes in each travel direction. The improvements extend from just east of the I-295 interchange approximately 5 miles east to the King Street overpass (just west of the I-95 interchange). The additional general-purpose lanes will be added to the outside of the existing travel lanes and located within existing FDOT ROW (**Figure 4-1**).

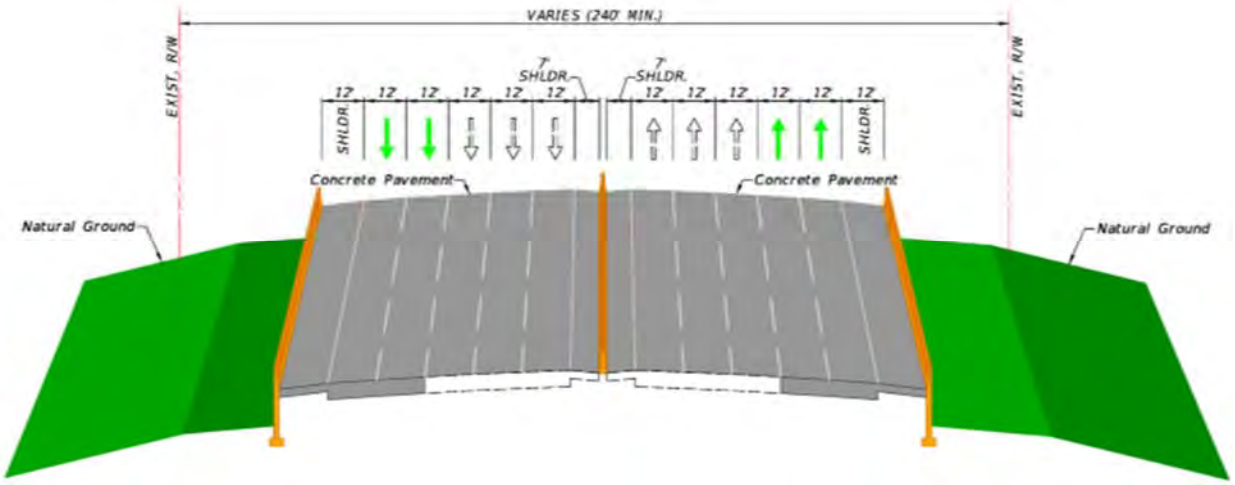


Figure 4-1. Proposed I-10 (SR 8) Widening Typical Section

Due to ROW constraints along the study area, improvements will include the installation of Mechanically Stabilized Earth (MSE) walls to allow for and stabilize roadway expansion. For this alternative, proposed improvements shown in **Figures 4-2** thru **4-5**.

4.3.2 Interchange Improvements, I-10 (SR 8) with Lane Avenue (SR 103)

An Interchange Operational Analysis Report (IOAR) was completed for the 1-10 (SR 8) at Lane Avenue (SR 103) interchange to identify improvements needed to reduce congestion and queue lengths at ramp terminal intersections, reduce mainline I-10 spillback, and reduce traffic delays. The existing interchange is a diamond-configured interchange with a major urban arterial. Several improvements are proposed as part of the interchange improvements for I-10 (SR 8) with Lane Avenue (SR 103). For this alternative, proposed improvements are described below and shown in **Figure 4-3**.

- Two additional general-purpose lanes in both directions (eastbound and westbound) along I-10 (SR 8)
- Additional right turn lane from I-10 (SR 8) eastbound off-ramp to southbound Lane Avenue (SR 103)
- Additional through lane along southbound Lane Avenue (SR 103) between the I-10 (SR 8) ramp terminal intersections.
- Additional left turn lane from northbound Lane Avenue (SR 103) to I-10 (SR 8) westbound on-ramp
- All right-turns from I-10 (SR 8) off-ramps are regulated by signals

In addition to the improvements listed above, traffic operational improvements include optimizing signal timings and lengthened acceleration and deceleration lanes along I-10 (SR 8) for the entrance and exit ramps to Lane Avenue (SR 103).

4.3.3 Interchange Improvements, I-10 (SR 8) with Cassat Avenue (SR 111)

An IOAR was completed for the 1-10 (SR 8) at Cassat Avenue (SR 111) interchange to identify improvements needed to reduce congestion and queue lengths at ramp terminal intersections, reduce mainline I-10 spillback, and reduce traffic delays. The existing interchange is a diamond-configured interchange with a major urban arterial. Several improvements are proposed as part of the interchange improvements for I-10 (SR 8) with Cassat Avenue (SR 111). For this alternative, proposed improvements are described below and shown in **Figure 4-4**.

- Two additional general-purpose lanes in both directions (eastbound and westbound) along I-10 (SR 8)
- Additional right turn lane from I-10 (SR 8) eastbound off-ramp to southbound Cassat Avenue (SR 111)
- Additional through lane along southbound Cassat Avenue (SR 111) between the I-10 (SR 8) ramp terminal intersections
- Additional left turn lane from eastbound Lenox Avenue to northbound Cassat Avenue (SR 111)
- Removal of right turn storage bay from northbound Cassat Avenue (SR 111) and a westbound receiving lane along Lenox Avenue for the intersection of Cassat Avenue (SR 111) at Lenox Avenue to eliminate the need for additional right of way for the improvements

4.4 Evaluation Matrix

The project is evaluated with respect to transportation, socio-economic, cultural, physical, natural, and biological resources as part of the PD&E Study. The analysis of the potential beneficial or adverse impacts of the project's Recommended Alternative and No Build Alternative are summarized in **Tables 4-1**.

Table 4-1. Evaluation Matrix – I-10 (SR 8) from I-295 to I-95

Item	No-Build Alternative	Alternative 1
Project Cost		
Estimated Construction Costs	$0	$125,000,000
Design Costs (10%)	$0	$12,500,000
Construction Engineering and Inspection (12%)	$0	$15,000,000
Estimated Right of Way Costs	$0	$0
Wetland Mitigation Costs [(1)]	$0	$2,125,200
Total Costs [(2)]	**$0**	**$154,625,200**
Socio-Economic Impacts		
No. of Parcels Affected	0	0
Residential	0	0
Commercial	0	0
Vacant	0	0
Relocations	0	0
Traffic Operations and Safety		
Improves Traffic Operations	No	Yes
Improves Safety	No	Yes
Environmental Impacts		
Potential Wetland Impacts (acres)	0.00	19.32 [(*)]
Archaeological/Historical Sites	0/0	1/0
Contamination Sites (high/medium/low/No)	0/0/0/0	37/27/8/10

Note: (1) Wetland mitigation was assumed to be $110,000 per acre
(2) Total Cost = LRE Construction Costs + Engineering Costs + CEI + Estimated R/W Costs
(*) – Preliminary wetland impacts are subject to change based on final design

4.5 Recommended Alternative

Following the March 30, 2017 public workshop, a meeting was held with FDOT to discuss the comprehensive resources evaluation, transportation and traffic studies, costs, and involvement of the public, local and state officials, and select a recommended alternative for the project. The Recommended Alternative for the project includes the I-10 mainline widening presented in Alternative 1 and proposed interchange improvements at I-10 (SR 8) with Lane Avenue (SR 103) and Cassat Avenue (SR 111) interchanges. The Recommended Alternative (Alternative 1) is shown in **Figures 4-2** thru **4-5** and included in **Appendix A**.

The Build Alternative improves traffic operations along I-10 (SR 8) within the study area through the Design Year (2045) when compared to the No Build Alternative. In the Design Year (2045), the Build Alternative decreases the number of vehicles that cannot enter the network from 31,698 vehicles with the No Build Alternative to 2,622 vehicles in the AM peak period, an approximate 92 percent reduction. During the PM peak period, vehicles that cannot enter the network decrease from 22,649 vehicles to approximately 10 vehicles in the PM peak period, an approximate 100 percent reduction. The Build Alternative decreases the total delay per vehicle, increases the average speeds, serves more vehicles, and decreases the system-wide travel time during the AM and PM peak periods when compared with the No Build Alternative during the Opening Year (2025) and Design Year (2045) conditions.

A public hearing will be conducted for this project. The FDOT will continue to coordinate with all project stakeholders following completion of the PD&E Study and through the design process. A copy of the public hearing transcript will be included as **Appendix G**.

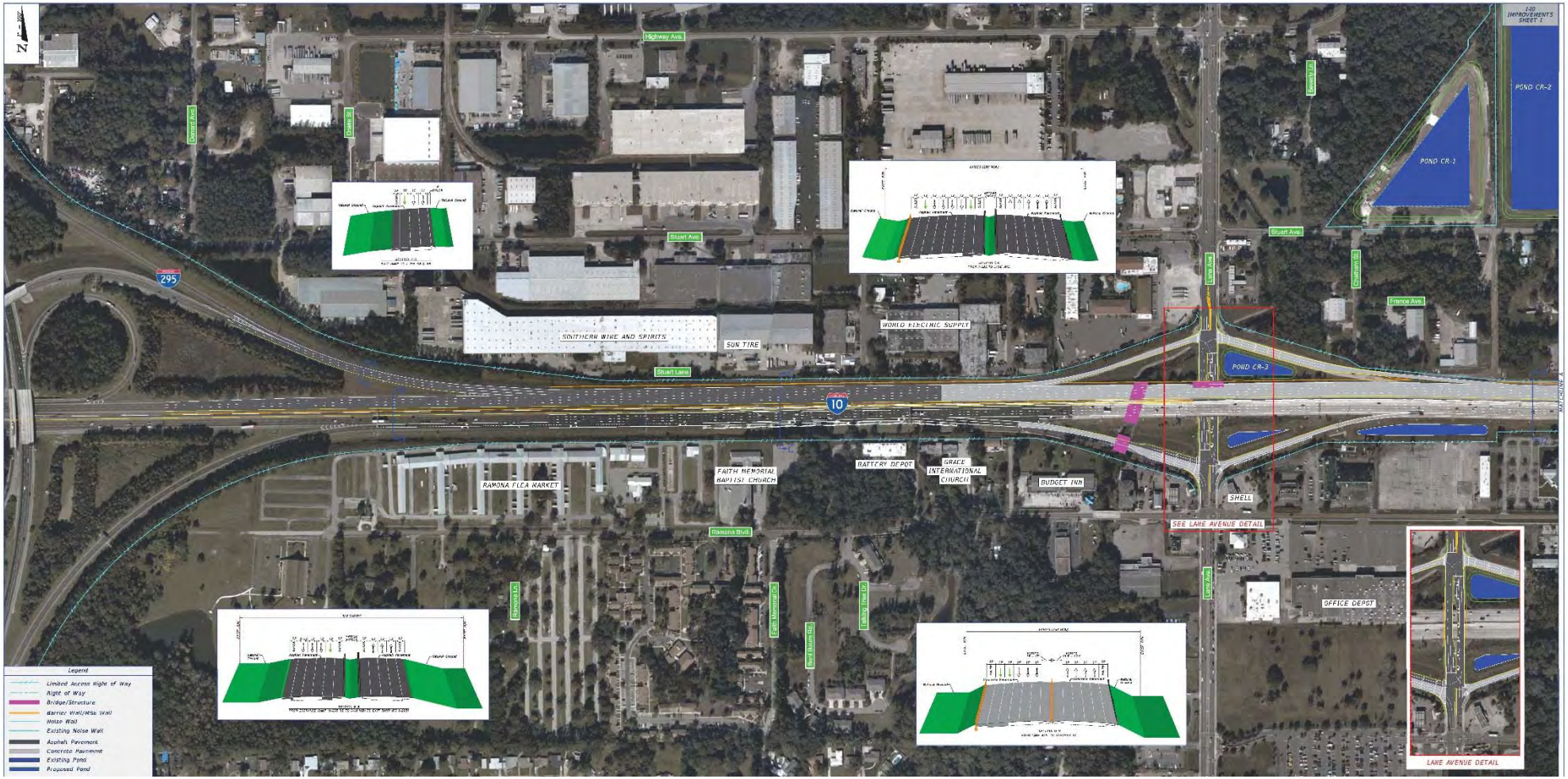


Figure 4-2. Alternative 1 – Sheet 1 of 4

Figure 4-3. Alternative 1 – Sheet 2 of 4

Figure 4-4. Alternative 1 – Sheet 3 of 4

Figure 4-5. Alternative 1 – Sheet 4 of 4

5. Recommended Alternative

5.1 Engineering Details of the Recommended Alternative

5.1.1 Typical Sections

The proposed typical sections for I-10 (SR 8) from I-295 to I-95 Recommended Alternative provide five 12-foot lanes in the eastbound direction between Cassat Avenue (SR 111) and Roosevelt Boulevard (US 17) and between Roosevelt Boulevard (US 17) and I-295 in the westbound direction. **Figure 5-1** shows the general typical section proposed along I-10 (SR 8) within the project limits. **Appendix H** depicts more detailed information for the project proposed typical sections along I-10 (SR 8) between I-295 and I-95.

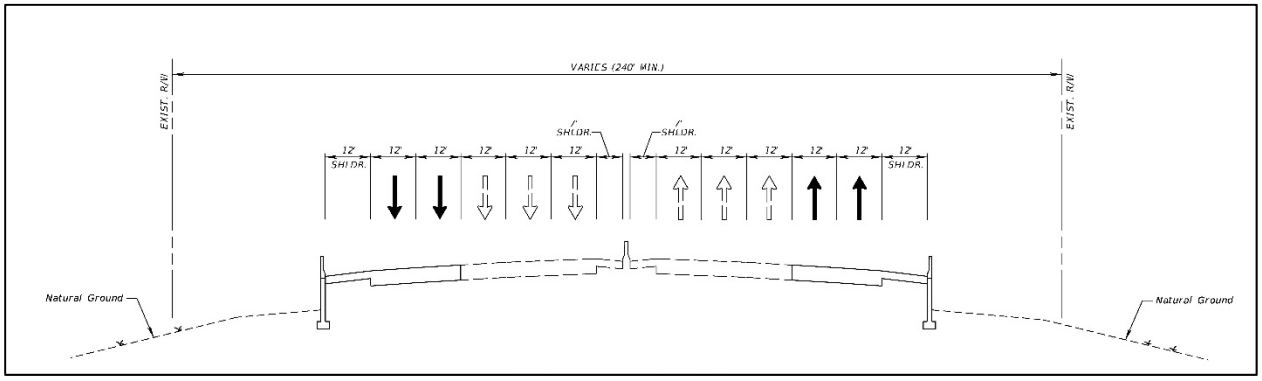


Figure 5-1. Proposed Roadway Typical Section – I-10 (SR 8)

5.1.2 Alignment

No changes to the existing centerline alignment are proposed with this project. The project maintains the existing horizontal and vertical geometrical characteristics of the existing I-10 (SR 8) roadway within the project limits.

5.1.3 Design Variations and Exceptions

5.1.3.1 Variations

The following design variations have been identified for the I-10 (SR 8) from I-295 and I-95 Recommended Alternative. These design variations are a result of existing geometric deficiencies along I-10 (SR 8) and the proposed design does not worsen the magnitude of these variations, but maintains the current conditions:

- Border Width
- Cross Slope
- Design Speed
- Median Width
- Shoulder Width
- Stopping Sight Distance
- Vertical Clearance

According to current FDOT PPM standards (Topic #625-000-007), a 94-foot border width is required to be maintained. However, the minimum proposed width of the Recommended Alternative is approximately 14 feet. **Table 5-1** summarizes this information.

Table 5-1. Border Width Variation – I-10 (SR 8) from I-295 to I-95

Location	Min. Width (FT)	FDOT Criteria (FT)
Entire Corridor	14	94

Multiple sections of the I-10 mainline do not meet current FDOT design criteria for cross slope. Current FDOT PPM standards designate the required roadway cross slopes for all travel lanes in one direction for new construction. A summary of the Recommended Alternative's cross slopes as compared to current standards and the FDOT design criteria are provided in **Table 5-2**.

Table 5-2. Cross Slope Variations – I-10 (SR 8) from I-295 to I-95

Location	Station Range			Cross Slope Range			FDOT Allowable Range	AASHTO Allowable Range
	STA.	to	STA.	Min.	to	Max.		
Westbound Outside Lane	77+00.00	-	77+00.00	-0.021	-	-0.021	0.025-0.035	0.015-0.040
	79+00.00	-	80+00.00	-0.022	-	-0.024	0.025-0.035	0.015-0.040
	84+00.00	-	84+00.00	-0.023	-	-0.023	0.025-0.035	0.015-0.040
	86+00.00	-	86+00.00	-0.023	-	-0.023	0.025-0.035	0.015-0.040
	90+00.00	-	90+00.00	-0.022	-	-0.022	0.025-0.035	0.015-0.040
	92+00.00	-	92+00.00	-0.02	-	-0.02	0.025-0.035	0.015-0.040
	94+00.00	-	100+00.00	-0.017	-	-0.022	0.025-0.035	0.015-0.040
	110+00.00	-	111+00.00	-0.013	-	-0.02	0.025-0.035	0.015-0.040
	114+00.00	-	118+00.00	-0.018	-	-0.022	0.025-0.035	0.015-0.040
	120+00.00	-	120+00.00	-0.016	-	-0.016	0.025-0.035	0.015-0.040
	123+00.00	-	124+00.00	-0.015	-	-0.017	0.025-0.035	0.015-0.040
	126+00.00	-	130+00.00	-0.016	-	-0.021	0.025-0.035	0.015-0.040
	132+00.00	-	134+00.00	-0.015	-	-0.02	0.025-0.035	0.015-0.040
	169+00.00	-	173+00.00	-0.015	-	-0.018	0.025-0.035	0.015-0.040
	199+00.00	-	199+00.00	-0.016	-	-0.016	0.025-0.035	0.015-0.040
	218+00.00	-	218+00.00	-0.023	-	-0.023	0.025-0.035	0.015-0.040
	220+00.00	-	226+00.00	-0.015	-	-0.019	0.025-0.035	0.015-0.040
	231+00.00	-	231+00.00	-0.018	-	-0.018	0.025-0.035	0.015-0.040
	233+00.00	-	233+00.00	-0.02	-	-0.02	0.025-0.035	0.015-0.040
	238+00.00	-	241+00.00	-0.016	-	-0.024	0.025-0.035	0.015-0.040
	243+00.00	-	243+00.00	-0.015	-	-0.015	0.025-0.035	0.015-0.040
	249+00.00	-	249+00.00	-0.016	-	-0.016	0.025-0.035	0.015-0.040
	253+00.00	-	254+00.00	-0.016	-	-0.018	0.025-0.035	0.015-0.040
	257+00.00	-	262+00.00	-0.017	-	-0.021	0.025-0.035	0.015-0.040
	264+00.00	-	264+00.00	-0.015	-	-0.015	0.025-0.035	0.015-0.040
	267+00.00	-	267+00.00	-0.017	-	-0.017	0.025-0.035	0.015-0.040
Westbound Middle Lane	See Design Exception for Locations							

Location	Station Range			Cross Slope Range			FDOT Allowable Range	AASHTO Allowable Range
	STA.	to	STA.	Min.	to	Max.		
Westbound Inside Lane	See Design Exception for Locations							
Eastbound Inside Lane	See Design Exception for Locations							
Eastbound Middle Lane	See Design Exception for Locations							
Eastbound Outside Lane	75+00.00	-	76+00.00	-0.018	-	-0.023	0.025-0.035	0.015-0.040
	78+00.00	-	93+00.00	-0.015	-	-0.022	0.025-0.035	0.015-0.040
	96+00.00	-	97+00.00	-0.019	-	-0.024	0.025-0.035	0.015-0.040
	99+00.00	-	99+00.00	-0.019	-	-0.019	0.025-0.035	0.015-0.040
	101+00.00	-	103+00.00	-0.018	-	-0.023	0.025-0.035	0.015-0.040
	110+00.00	-	117+00.00	-0.016	-	-0.021	0.025-0.035	0.015-0.040
	119+00.00	-	120+00.00	-0.017	-	-0.022	0.025-0.035	0.015-0.040
	123+00.00	-	125+00.00	-0.017	-	-0.019	0.025-0.035	0.015-0.040
	127+00.00	-	132+00.00	-0.015	-	-0.018	0.025-0.035	0.015-0.040
	153+00.00	-	154+00.00	-0.021	-	-0.024	0.025-0.035	0.015-0.040
	168+00.00	-	169+00.00	-0.019	-	-0.023	0.025-0.035	0.015-0.040
	173+00.00	-	173+00.00	-0.019	-	-0.019	0.025-0.035	0.015-0.040
	193+00.00	-	201+00.00	-0.016	-	-0.022	0.025-0.035	0.015-0.040
	218+00.00	-	224+00.00	-0.016	-	-0.021	0.025-0.035	0.015-0.040
	227+00.00	-	227+00.00	-0.015	-	-0.015	0.025-0.035	0.015-0.040
	235+00.00	-	236+00.00	-0.017	-	-0.017	0.025-0.035	0.015-0.040
	238+00.00	-	239+00.00	-0.016	-	-0.016	0.025-0.035	0.015-0.040
	248+00.00	-	255+00.00	-0.016	-	-0.023	0.025-0.035	0.015-0.040
	257+00.00	-	258+00.00	-0.018	-	-0.02	0.025-0.035	0.015-0.040
	260+00.00	-	263+00.00	-0.015	-	-0.016	0.025-0.035	0.015-0.040
	265+00.00	-	267+00.00	-0.016	-	-0.021	0.025-0.035	0.015-0.040

The FDOT PPM states that the minimum design speed of an existing urbanized SIS highway corridor is 60 mph and the criteria provided in *A Policy on Geometric Design of Highways and Streets* (AASHTO) states a minimum design speed of no less than 50 mph should be used for a freeway facility. The locations not meeting current FDOT design criteria, but meeting the AASHTO criteria are summarized in **Table 5-3**.

Table 5-3. Design Speed Variations – I-10 (SR 8) from I-295 to I-95

Location	Current Posted Speed	FDOT Criteria (MPH)	AASHTO Criteria (MPH)
I-295 to Roosevelt Boulevard (US 17)	55	60	50
Roosevelt Boulevard (US 17) to I-95	50	60	50

According to the FDOT PPM standards (Topic #625-000-007), the median width for all freeway facilities with barriers at all design speeds is to be maintained at 26 feet. The locations where the Recommended Alternative does not meet current FDOT standards is provided in **Table 5-4**.

Table 5-4. Median Width Variations – I-10 (SR 8) from I-295 to I-95

Location	Begin Sta.	End Sta.	Width	FDOT Criteria (FT)
From Ellis Rd to McDuff Ave (SR 129)	139+80	267+10	26 to 16	26
From King St to CSX Railroad	749+60	755+41	16 to 12	26
From CSX Railroad to I-95	655+36	678+00	12 to 26	26

According to the FDOT PPM, shoulder widths for freeways with four lanes or more in one direction is to be maintained as 12-feet with a paved width of ten feet. The AASHTO criteria is a minimum median/left shoulder width of ten feet for a six-lane or greater freeway with 12-foot median shoulders preferred for sections with high truck traffic. The locations where the Recommended Alternative does not meet the current FDOT design standards, but meets AASHTO criteria are provided in **Table 5-5**.

Table 5-5. Shoulder Width Variations – I-10 (SR 8) from I-295 to I-95

Location	Begin STA.	End STA.	Lane Direction	Shoulder Side	Width (FT)	FDOT Criteria (FT)	AASHTO Criteria (FT)
Between McDuff Ave (SR 129) and CSX Railroad	729+50	755+60	Westbound	Outside	10	12	10
Between CSX Railroad and I-95	668+00	670+50	Westbound	Outside	10	12	10
Between CSX Railroad and I-95	665+00	676+00	Westbound	Inside	10	12	10
Between Ellis Rd and Cassat Ave (SR 111)	138+00	147+00	Eastbound	Outside	10.5	15.5	10
Between McDuff Ave (SR 129) and CSX Railroad	729+30	752+00	Eastbound	Inside	10	12	10
Between Roosevelt Blvd (US 17) and CSX Railroad	742+20	755+40	Eastbound	Outside	10	12	10
Between CSX Railroad and I-95	655+64	662+20	Eastbound	Outside	10	12	10
Between CSX Railroad and I-95	665+00	680+00	Eastbound	Inside	6	8	4

According to the FDOT PPM, the minimum stopping sight distance for an interstate with a design speed of 60 mph is 645 feet. According to AASHTO, stopping sight distance for an interstate with a design speed of 60 mph is 570 feet. The locations where the Recommended Alternative does not meet the current FDOT design standards, but meets AASHTO criteria are provided in **Table 5-6**.

Table 5-6. Stopping Sight Distance Variations – I-10 (SR 8) from I-295 to I-95

Location	Direction	Calculated SSD (FT)	FDOT SSD (FT)	AASHTO SSD (FT)
Over Cassat Ave (SR 111)	Westbound	637.25	645	570
Between McDuff Ave (SR 129) and King St	Westbound	619.03	645	570

According to the FDOT PPM standards, the vertical clearance underneath structures for urban arterials and collectors without curb and gutter should be maintained at 16.5 feet. AASHTO criteria states a minimum vertical clearance for existing structures as 14 feet. **Table 5-7** summarizes the locations where the FDOT minimum criteria is not met by the Recommended Alternative.

Table 5-7. Vertical Clearance Variations – I-10 (SR 8) from I-295 to I-95

Location	Bridge Number	Existing Clearance	FDOT Criteria	AASHTO Criteria
Stockton St (EB)	720196	14' 7"	16' 6"	14'
King St (WB)	720194	14' 3"	16' 6"	14'
King St (EB)	720314	14' 3"	16' 6"	14'
Roosevelt Blvd (US 17)	720193	14' 10"	16' 6"	14'
McDuff Ave (SR 129)	720313	14' 5"	16' 6"	14'
Nelson Street	720312	14' 4"	16' 6"	14'
Luna St	720311	14" 3"	16' 6"	14'
Edgewood Ave	720310	15' 3"	16' 6"	14'
Cassat Ave (SR 111)	720309	14' 10"	16' 6"	14'
Ellis Rd (WB)	720187	14' 3"	16' 6"	14'
Ellis Rd (EB)	720308	14' 3"	16' 6"	14'
Lane Ave (SR 103) (WB)	720186	14' 4"	16' 6"	14'
Lane Ave (SR 103) (EB)	720307	14' 4"	16' 6"	14'

The required design variations maintain existing roadway characteristics and therefore, driver expectancy is anticipated to remain unchanged. Design variations and exceptions will be developed for this project and will be processed in coordination with the District Design Engineer following FDOT and FHWA guidelines and will be included in the Design-Build RFP Package.

5.1.3.2 Exceptions

The following design exceptions have been identified for the I-10 (SR 8) from I-295 and I-95 Recommended Alternative. These design exceptions are a result of existing geometric deficiencies along I-10 (SR 8) and the proposed design does not worsen the magnitude of these exceptions, but maintain the current conditions:

- Design Loading Structural Capacity
- Shoulder Width
- Stopping Sight Distance
- Superelevation Rate
- Cross Slope

Design loading structural capacity s exceptions are anticipated for the Recommended Alternative and are summarized in **Table 5-8**.

Table 5-8. Loading Structural Capacity Exceptions – I-10 (SR 8) from I-295 to I-95

Location	Year of Rating	Rating Factor	AASHTO Criteria
Eastbound Bridge over Cassat Ave (SR 111)	1989	0.97	< 1.0
Eastbound Bridge over Nelson Ave	2011	0.83	< 1.0
Eastbound Bridge over Roosevelt Blvd (US 17)	2011	0.95	< 1.0
Eastbound Bridge over King St	2005	0.96	< 1.0
Eastbound Bridge over Stockton St	2009	0.94	< 1.0

Shoulder width design exceptions anticipated for the Recommended Alternative and are summarized in **Table 5-9**.

Table 5-9. Shoulder Width Exceptions – I-10 (SR 8) from I-295 to I-95

Location	Begin STA.	End STA.	Lane Direction	Shoulder Side	Width (FT)	FDOT Criteria (FT)	AASHTO Criteria (FT)
Between Lane Ave (SR 103) and Ellis Rd	137+80	139+00	Westbound	Inside	10-7	12	10
From Ellis Road to McDuff Ave (SR 129)	139+00	267+10	Westbound	Inside	7	12	10
From McDuff Ave (SR 129) to Roosevelt Blvd (US 17)	724+90	726+50	Westbound	Inside	7-10	12	10
From CSX Railroad to Stockton St	655+80	663+50	Westbound	Inside	6	12	10
Between Ellis Rd and Cassat Ave (SR 111)	143+20	147+20	Eastbound	Inside	10-7	12	10
Between Ellis Rd and McDuff Ave (SR 129)	147+20	267+10	Eastbound	Inside	7	12	10
Between McDuff Ave (SR 129) and Roosevelt Blvd (US 17)	724+90	729+20	Eastbound	Inside	7-10	12	10
Between King St and CSX Railroad	752+00	755+40	Eastbound	Inside	10-6	12	10
Between King St and CSX Railroad	655+80	658+50	Eastbound	Inside	6	12	10

Stopping sight distance design exceptions are anticipated for the Recommended Alternative and are summarized in **Table 5-10**.

Table 5-10. Stopping Sight Distance Exceptions – I-10 (SR 8) from I-295 to I-95

Location	Direction	Existing SSD (FT)	Calculated SSD (FT)	FDOT SSD (FT)	AASHTO SSD (FT)
Approaching Cassat Ave (SR 111)	Westbound	559.98	559.98	645	570
Approaching Luna St.	Westbound	400.22	400.22	645	570
Over King St.	Westbound	567.55	478.54	645	570
Between Lane Ave (SR 103) and Cassat Ave (SR 111)	Eastbound	564.6	564.6	645	570
Over Cassat Ave (SR 111)	Eastbound	547.4	547.4	645	570
Approaching Luna St	Eastbound	464.37	460.61	645	570
Over Roosevelt Blvd (US 17)	Eastbound	520.03	520.03	645	570
Over King St	Eastbound	482.66	479.45	645	570

Superelevation design exceptions are anticipated for the Recommended Alternative and are summarized in **Table 5-11**.

Table 5-11. Superelevation Rate Exceptions – I-10 (SR 8) from I-295 to I-95

Location	Direction	Radius (FT)	*e*	FDOT Criteria (*e*)	AASHTO Criteria (*e*)	Equivalent Design Speed
Between Lane Ave (SR 103) and Cassat Ave (SR 111)	EB & WB	3050	0.030	0.053	0.052	45
Approaching Cassat Ave (SR 111)	EB & WB	3000	0.035	0.053	0.053	45
Over Cassat Ave (SR 111)	EB & WB	2865	0.037	0.055	0.055	45
Approaching Luna St	EB & WB	1525	0.071	0.090	0.090	50
Over Roosevelt Blvd (US 17)	EB	2128	0.055	0.071	0.07	50
Over King St	EB	1844	0.055	0.079	0.079	50

Location	Direction	Radius (FT)	*e*	FDOT Criteria (*e*)	AASHTO Criteria (*e*)	Equivalent Design Speed
Between McDuff Ave (SR 129) and King St	WB	2986	0.045	0.053	0.051	55
Over King St	WB	2378	0.045	0.065	0.064	50

Cross slope design exceptions are anticipated for the Recommended Alternative and are summarized in **Table 5-12**.

Table 5-12. Planning Cross Slope Exceptions – I-10 (SR 8) from I-295 to I-95

Location	Station Range			Cross Slope Range			FDOT Allowable Range	AASHTO Allowable Range
	STA.	to	STA.	Min.	to	Max.		
Westbound Outside Lane	78+00.00	-	78+00.00	-0.013	-	-0.013	0.025-0.035	0.015-0.040
	108+00.00	-	108+00.00	-0.006	-	-0.006	0.025-0.035	0.015-0.040
	112+00.00	-	112+00.00	-0.013	-	-0.02	0.025-0.035	0.015-0.040
	119+00.00	-	119+00.00	-0.011	-	-0.011	0.025-0.035	0.015-0.040
	121+00.00	-	121+00.00	-0.012	-	-0.012	0.025-0.035	0.015-0.040
	125+00.00	-	125+00.00	-0.007	-	-0.007	0.025-0.035	0.015-0.040
	131+00.00	-	131+00.00	-0.013	-	-0.013	0.025-0.035	0.015-0.040
	135+00.00	-	136+00.00	-0.008	-	-0.004	0.025-0.035	0.015-0.040
	174+00.00	-	174+00.00	-0.013	-	-0.013	0.025-0.035	0.015-0.040
	192+00.00	-	198+00.00	-0.006	-	-0.014	0.025-0.035	0.015-0.040
	216+00.00	-	217+00.00	-0.01	-	-0.012	0.025-0.035	0.015-0.040
	219+00.00	-	219+00.00	-0.01	-	-0.01	0.025-0.035	0.015-0.040
	227+00.00	-	230+00.00	-0.01	-	-0.013	0.025-0.035	0.015-0.040
	232+00.00	-	232+00.00	-0.013	-	-0.013	0.025-0.035	0.015-0.040
	234+00.00	-	234+00.00	-0.011	-	-0.011	0.025-0.035	0.015-0.040
	242+00.00	-	242+00.00	-0.014	-	-0.014	0.025-0.035	0.015-0.040
	244+00.00	-	248+00.00	-0.008	-	-0.014	0.025-0.035	0.015-0.040
	250+00.00	-	252+00.00	-0.01	-	-0.014	0.025-0.035	0.015-0.040
	255+00.00	-	256+00.00	-0.008	-	-0.013	0.025-0.035	0.015-0.040
	263+00.00	-	263+00.00	-0.011	-	-0.011	0.025-0.035	0.015-0.040
	265+00.00	-	266+00.00	-0.014	-	-0.014	0.025-0.035	0.015-0.040
Westbound Middle Lane	101+00.00	-	102+00.00	-0.011	-	-0.014	0.015-0.025	0.015-0.025
	105+00.00	-	110+00.00	-0.01	-	-0.013	0.015-0.025	0.015-0.025
	113+00.00	-	113+00.00	-0.01	-	-0.01	0.015-0.025	0.015-0.025
	115+00.00	-	119+00.00	-0.006	-	-0.014	0.015-0.025	0.015-0.025
	122+00.00	-	122+00.00	-0.01	-	-0.01	0.015-0.025	0.015-0.025
	124+00.00	-	124+00.00	-0.013	-	-0.013	0.015-0.025	0.015-0.025
	126+00.00	-	127+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	134+00.00	-	136+00.00	-0.011	-	-0.013	0.015-0.025	0.015-0.025
	152+00.00	-	153+00.00	-0.004	-	-0.011	0.015-0.025	0.015-0.025
	169+00.00	-	169+00.00	-0.013	-	-0.013	0.015-0.025	0.015-0.025

Location	Station Range			Cross Slope Range			FDOT Allowable Range	AASHTO Allowable Range
	STA.	to	STA.	Min.	to	Max.		
	173+00.00	-	173+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	195+00.00	-	199+00.00	-0.01	-	-0.014	0.015-0.025	0.015-0.025
	216+00.00	-	218+00.00	-0.013	-	-0.014	0.015-0.025	0.015-0.025
	221+00.00	-	221+00.00	-0.01	-	-0.01	0.015-0.025	0.015-0.025
	223+00.00	-	227+00.00	-0.01	-	-0.014	0.015-0.025	0.015-0.025
	234+00.00	-	234+00.00	-0.005	-	-0.005	0.015-0.025	0.015-0.025
	237+00.00	-	239+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	258+00.00	-	260+00.00	-0.013	-	-0.014	0.015-0.025	0.015-0.025
Westbound Inside Lane	75+00.00	-	75+00.00	-0.013	-	-0.013	0.015-0.025	0.015-0.025
	78+00.00	-	78+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	80+00.00	-	82+00.00	-0.013	-	-0.014	0.015-0.025	0.015-0.025
	85+00.00	-	85+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	88+00.00	-	91+00.00	-0.012	-	-0.014	0.015-0.025	0.015-0.025
	94+00.00	-	94+00.00	-0.012	-	-0.012	0.015-0.025	0.015-0.025
	99+00.00	-	106+00.00	-0.007	-	-0.014	0.015-0.025	0.015-0.025
	108+00.00	-	109+00.00	-0.004	-	-0.007	0.015-0.025	0.015-0.025
	113+00.00	-	116+00.00	-0.008	-	-0.014	0.015-0.025	0.015-0.025
	119+00.00	-	119+00.00	-0.013	-	-0.013	0.015-0.025	0.015-0.025
	122+00.00	-	122+00.00	-0.013	-	-0.013	0.015-0.025	0.015-0.025
	129+00.00	-	132+00.00	-0.008	-	-0.014	0.015-0.025	0.015-0.025
	169+00.00	-	171+00.00	-0.011	-	-0.014	0.015-0.025	0.015-0.025
	198+00.00	-	198+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	224+00.00	-	225+00.00	-0.013	-	-0.014	0.015-0.025	0.015-0.025
	233+00.00	-	233+00.00	-0.01	-	-0.01	0.015-0.025	0.015-0.025
	241+00.00	-	241+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	248+00.00	-	254+00.00	-0.011	-	-0.014	0.015-0.025	0.015-0.025
	257+00.00	-	257+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
Eastbound Inside Lane	79+00.00	-	83+00.00	-0.011	-	-0.014	0.015-0.025	0.015-0.025
	86+00.00	-	90+00.00	-0.004	-	-0.013	0.015-0.025	0.015-0.025
	92+00.00	-	94+00.00	-0.006	-	-0.012	0.015-0.025	0.015-0.025
	97+00.00	-	97+00.00	-0.013	-	-0.013	0.015-0.025	0.015-0.025
	99+00.00	-	99+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	101+00.00	-	101+00.00	-0.012	-	-0.012	0.015-0.025	0.015-0.025
	103+00.00	-	103+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	106+00.00	-	106+00.00	-0.011	-	-0.011	0.015-0.025	0.015-0.025
	113+00.00	-	120+00.00	-0.005	-	-0.014	0.015-0.025	0.015-0.025
	122+00.00	-	123+00.00	-0.005	-	-0.012	0.015-0.025	0.015-0.025
	126+00.00	-	133+00.00	-0.007	-	-0.014	0.015-0.025	0.015-0.025

Location	Station Range			Cross Slope Range			FDOT Allowable Range	AASHTO Allowable Range
	STA.	to	STA.	Min.	to	Max.		
	168+00.00	-	168+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	194+00.00	-	194+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	197+00.00	-	199+00.00	-0.013	-	-0.014	0.015-0.025	0.015-0.025
	213+00.00	-	214+00.00	-0.012	-	-0.013	0.015-0.025	0.015-0.025
	217+00.00	-	218+00.00	-0.013	-	-0.014	0.015-0.025	0.015-0.025
	227+00.00	-	227+00.00	-0.012	-	-0.012	0.015-0.025	0.015-0.025
	234+00.00	-	236+00.00	-0.008	-	-0.014	0.015-0.025	0.015-0.025
	238+00.00	-	238+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	249+00.00	-	251+00.00	-0.013	-	-0.014	0.015-0.025	0.015-0.025
	257+00.00	-	259+00.00	-0.01	-	-0.014	0.015-0.025	0.015-0.025
Eastbound Middle Lane	77+00.00	-	77+00.00	-0.011	-	-0.011	0.015-0.025	0.015-0.025
	83+00.00	-	85+00.00	-0.013	-	-0.014	0.015-0.025	0.015-0.025
	88+00.00	-	88+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	90+00.00	-	90+00.00	-0.01	-	-0.01	0.015-0.025	0.015-0.025
	96+00.00	-	97+00.00	-0.013	-	-0.014	0.015-0.025	0.015-0.025
	102+00.00	-	102+00.00	-0.013	-	-0.013	0.015-0.025	0.015-0.025
	104+00.00	-	105+00.00	-0.001	-	-0.011	0.015-0.025	0.015-0.025
	107+00.00	-	108+00.00	-0.013	-	-0.014	0.015-0.025	0.015-0.025
	110+00.00	-	112+00.00	-0.009	-	-0.014	0.015-0.025	0.015-0.025
	114+00.00	-	115+00.00	-0.011	-	-0.013	0.015-0.025	0.015-0.025
	117+00.00	-	119+00.00	-0.005	-	-0.013	0.015-0.025	0.015-0.025
	122+00.00	-	124+00.00	-0.013	-	-0.014	0.015-0.025	0.015-0.025
	129+00.00	-	129+00.00	-0.013	-	-0.013	0.015-0.025	0.015-0.025
	131+00.00	-	131+00.00	-0.012	-	-0.012	0.015-0.025	0.015-0.025
	133+00.00	-	134+00.00	-0.011	-	-0.012	0.015-0.025	0.015-0.025
	153+00.00	-	154+00.00	-0.009	-	-0.014	0.015-0.025	0.015-0.025
	194+00.00	-	198+00.00	-0.009	-	-0.014	0.015-0.025	0.015-0.025
	200+00.00	-	201+00.00	-0.013	-	-0.014	0.015-0.025	0.015-0.025
	214+00.00	-	214+00.00	-0.014	-	-0.014	0.015-0.025	0.015-0.025
	218+00.00	-	221+00.00	-0.01	-	-0.013	0.015-0.025	0.015-0.025
	223+00.00	-	225+00.00	-0.012	-	-0.014	0.015-0.025	0.015-0.025
	236+00.00	-	238+00.00	-0.009	-	-0.014	0.015-0.025	0.015-0.025
	240+00.00	-	241+00.00	-0.011	-	-0.014	0.015-0.025	0.015-0.025
	245+00.00	-	245+00.00	-0.011	-	-0.011	0.015-0.025	0.015-0.025
	247+00.00	-	248+00.00	-0.012	-	-0.014	0.015-0.025	0.015-0.025
	250+00.00	-	254+00.00	-0.006	-	-0.012	0.015-0.025	0.015-0.025
	257+00.00	-	257+00.00	-0.013	-	-0.013	0.015-0.025	0.015-0.025
	260+00.00	-	267+00.00	-0.01	-	-0.014	0.015-0.025	0.015-0.025

Location	Station Range			Cross Slope Range			FDOT Allowable Range	AASHTO Allowable Range
	STA.	to	STA.	Min.	to	Max.		
Eastbound Outside Lane	94+00.00	-	95+00.00	-0.005	-	-0.014	0.025-0.035	0.015-0.040
	98+00.00	-	98+00.00	-0.005	-	-0.005	0.025-0.035	0.015-0.040
	100+00.00	-	100+00.00	-0.012	-	-0.012	0.025-0.035	0.015-0.040
	104+00.00	-	109+00.00	-0.006	-	-0.013	0.025-0.035	0.015-0.040
	118+00.00	-	118+00.00	-0.011	-	-0.011	0.025-0.035	0.015-0.040
	121+00.00	-	122+00.00	-0.012	-	-0.013	0.025-0.035	0.015-0.040
	126+00.00	-	126+00.00	-0.01	-	-0.01	0.025-0.035	0.015-0.040
	133+00.00	-	135+00.00	-0.012	-	-0.014	0.025-0.035	0.015-0.040
	170+00.00	-	172+00.00	-0.011	-	-0.013	0.025-0.035	0.015-0.040
	214+00.00	-	217+00.00	-0.009	-	-0.012	0.025-0.035	0.015-0.040
	225+00.00	-	226+00.00	-0.012	-	-0.013	0.025-0.035	0.015-0.040
	228+00.00	-	234+00.00	-0.008	-	-0.013	0.025-0.035	0.015-0.040
	237+00.00	-	237+00.00	-0.013	-	-0.013	0.025-0.035	0.015-0.040
	240+00.00	-	247+00.00	-0.001	-	-0.011	0.025-0.035	0.015-0.040
	256+00.00	-	256+00.00	-0.013	-	-0.013	0.025-0.035	0.015-0.040
	259+00.00	-	259+00.00	-0.007	-	-0.007	0.025-0.035	0.015-0.040
	264+00.00	-	264+00.00	-0.013	-	-0.013	0.025-0.035	0.015-0.040

The required design exceptions maintain existing roadway characteristics and therefore, driver expectancy is anticipated to remain unchanged. Design variations and exceptions will be developed for this project and will be processed in coordination with the District Design Engineer following FDOT and FHWA guidelines and will be included in the Design-Build RFP Package.

5.1.4 Right of Way Needs and Relocation

The proposed roadway improvements associated with the Recommended Alternative can be accommodated within the existing FDOT and City of Jacksonville ROW. To minimize property impacts, operational improvements at Lane Avenue (SR 103) and Cassat Avenue (SR 111) are limited to existing FDOT and City of Jacksonville ROW. The proposed stormwater pond sites are located on lands currently owned by the FDOT or the City of Jacksonville and do not require additional ROW acquisition from private lands. No relocations are anticipated for the Recommended Alternative.

5.1.5 Intersection and Freeway Operations

A PTAR was completed for this project and is provided in **Appendix D**. The PTAR documents the operations of I-10 (SR 8) from I-295 to I-95 using VISSIM analysis software under the Existing Year (2016), Open Year (2025) and Design Year (2045) traffic conditions. The purpose of the PTAR completed for this PD&E Study is to document the engineering and operational acceptability of the improvements proposed to I-10 (SR 8) from I-295 to I-95.

Analyses of I-10 (SR 8) system, Lane Avenue (SR 103) and Cassat Avenue (SR 111) arterials, including the mainline and the interchange ramps for the Recommended Alternatives were evaluated using VISSIM software. Several MOEs were summarized and reported to evaluate the performance of the Recommended Alternatives when compared to

the No Build Alternative to justify the need for the project.

Two IOARs were completed for this PD&E study and summarizes the traffic operational and safety analysis performed to evaluate the operational performance of the Recommended Alternatives. These IOARs were submitted to FDOT for approval. These are:

- Lane Avenue (SR 103) Interchange Improvements IOAR
- Cassat Avenue (SR 111) Interchange Improvements IOAR

The two IOARs developed for this project are provided in **Appendix C**.

5.1.6 Planning Consistency

The federal Fixing America's Surface Transportation Act (FAST Act, 2015) serves as the current regulatory and funding framework for transportation planning. The TPO is the government organization that provides both long-range and short-term transportation planning for a six-county area including Duval County. The Path Forward 2040 Long Range Transportation Plan (LRTP, November 2014), as amended, represents long-term transportation planning for Duval County. Short-term planning is represented by the TPO's Transportation Improvement Program (TIP). The purpose of the LRTP is to identify the transportation needs of the community and establish priorities for funding those improvements in the TIP. The TPO projects are listed in the TIP FY 2017/18 – 2021/22 (April 2017). The project is identified in the Path Forward 2040 Final Needs Plan (Nov 2014).

FDOT lists planned projects with federal participation, including all TPO TIPs, in the State Transportation Improvement Program (STIP) which is submitted to and approved by the FHWA. The PD&E Study for the I-10 (SR 8) from I-295 to I-95 is programmed for PD&E Study under the STIP (June 2017). Improvements associated with I-10 from I-295 to I-95 are included in the SIS funded projects cost feasible component of the 2040 LRTP. Right of Way (ROW) acquisition and construction are included in the FY 2017/18 – 2021/22 TIP. Planning consistency information is presented in **Table 5-13**.

Table 5-13. Planning Consistency – I-10 (SR 8) from I-295 to I-95

Currently Adopted CFP-LRTP	**COMMENTS** **FM No. 213326-2: I-10 from I-295 to I-95** **FM No. 439100-1: I-10 from I-295 to I-95 (Westbound)** **FM No. 439102-1: I-10 from Cassat to I-95 (Eastbound)**				
Y	**All projects are listed in NFTPO 2040 LRTP and FDOT SIS First Five Year**				
PHASE	**Currently Approved TIP**	**Currently Approved STIP**	**TIP/STIP $**	**TIP/STIP FY**	**COMMENTS**
213326-2					
PE	Y	Y	$1,581,289	< 2017 - 2018	PD&E State Funds
439100-1					
PE	Y	Y	$2,997,700	2017 / 2018 2019 / 2020	Final Design State & Federal Funds
R/W	Y	Y	$3,850,000	2018 / 2019	RRU Federal Funds Note: STIP Amendment in processing

PHASE	Currently Approved TIP	Currently Approved STIP	TIP/STIP $	TIP/STIP FY	COMMENTS
CST	Y	Y	$95,148,106	2019 / 2020	Design Build Westbound Improvements Federal Funds
439102-1					
PE	Y	Y	$1,645,000	2017 / 2018	Final Design State & Federal Funds
R/W	Y	Y	$2,000,000	2018 / 2019	RRU Federal Funds
CST	Y	Y	$37,864,383	2019 / 2020	Design Build Eastbound Improvements Federal Funds

5.1.7 Bicycle and Pedestrian Facilities

The proposed typical sections (**Appendix H**) for the Recommended Alternative along I-10 (SR 8) does not provide for bicycle and pedestrian facilities because the improvements are located within the limited access ROW for I-10.

The existing sidewalks located to the east and west side of the roadways along several arterial interchanges within the project limits are maintained. Enhancements are being considered near the Stockton Street, McDuff Avenue (SR 129) and Day Avenue underpass tunnel to widen the sidewalks by cutting the sloped from the bridge embankments. No bicycle facilities are present along the project corridor under existing conditions and are not proposed with the proposed Recommended Alternative.

5.1.8 Utility Impacts

Existing utilities within the project area are described in **Table 2-6** and include overhead power lines, underground ITS fiber optic, cable, water distribution, sanitary and storm sewer, and gas distribution. Relocation of these utilities may be required to accommodate the proposed improvements based on the location and depth of these utilities. FDOT maintains underground ITS fiber optic and roadway lighting conduits or cables within the project area along I-10 (SR 8). Coordination during design and construction will be required to determine the need for these utility relocations. I-10 (SR 8) on- and off-ramp light poles in conflict with the proposed design will require relocation or replacement.

5.1.9 Railroad

The existing overpass bridge over CSX railroad which runs north to south through the project area is being widened to accommodate the additional westbound general-purpose lane along I-10 (SR 8). **Figure 5-2** shows the limits of the widening along the CSX railroad overpass bridge (Bridge # 720195). The construction work involves widening the bridge to the north and south and reconfiguring the median barrier wall. Coordination with CSX public projects liaison is being conducted by FDOT to obtain the necessary permits and clearances.

Figure 5-2. Proposed CSX Railroad Overpass Construction

5.1.10 Temporary Traffic Control Plan/Project Construction Phasing

At a minimum, all existing traffic lanes, including auxiliary lanes, should be maintained and remain open during construction. Widening of the structures over the arterials and the CSX Railroad along I-10 (SR 8) may require periodic lane closures that should be carefully coordinated with the FDOT and local jurisdictions. A three phase Temporary Traffic Control Plan is anticipated for this project:

- Phase I – Widen the outside shoulders of the bridges and construct the outside roadway widening.
- Phase II – Shift traffic to the outside lanes and construct the inside shoulders and roadway widening.
- Phase III – Mill and resurface/grind the existing lanes and construct the remaining overbuild.

5.1.11 Drainage

As part of the Department's Environmental Look Around (ELA) Policy to consider regional ponds as opposed to "postage stamp" ponds, an ELA was held on March 1, 2017 with FDOT District Two and SJRWMD. This ELA discussed the approach to best meet stormwater management and treatment of additional impervious area and provide treatment of currently untreated runoff within the Cedar River and McCoy Creek Basins. To minimize the requirement for additional ROW, a second ELA was held with the City of Jacksonville to identify potential parcels that could be utilized or expanded to accommodate increased runoff.

The pond sited in the Cedar River Basin, Pond CR-1, is located just east of Lane Avenue (SR 103), north of the project limits, and currently receives runoff from various land uses, some with higher nutrient concentrations than highway runoff. This pond was originally designed to provide attenuation only to alleviate flooding at Cassat Avenue (SR 111); however, under the I-10 (SR 8) widening project this pond will be expanded to also provide treatment of the existing runoff currently being conveyed to the pond. This compensating treatment will address the added impervious associated with the widening of I-10 (SR 8) within the Cedar River Basin.

Multiple pond sites have been identified in the McCoy Creek Basin. These ponds are all located along I-95, north of I-10 (SR 8) and will provide compensatory treatment for the I-10 (SR 8) added impervious. The first, Pond MC-2, is located just north of McCoy Creek and will treat I-95 runoff which currently discharges into McCoy Creek untreated. The basin limits for this pond includes I-95 between the bridges over McCoy Creek and CSX railroad. The second, Pond MC-3 or MC-5, are located just east of I-95 and to the north of Forsyth Street and will provide the remaining compensatory treatment for the I-10 (SR 8) added impervious. The basin limits for this pond includes I-95 between Forsyth Street and Church Street.

5.1.12 Structural Evaluation

The existing vertical clearance observed near the 15 bridge structures within the I-10 (SR 8) from I-295 and I-95 project study area are maintained with the proposed design by utilizing shallower beams for the widening. Load rating was performed for all 15 bridge structures within the I-10 (SR 8) project limits using approved FDOT Load Rating procedures. All 15 structures passed the load rating and were determined to be fit for widening. The Day Avenue underpass tunnel is proposed to be replaced with a similar 8-feet x 8-feet box span structure after consultation and coordination with FDOT Bridge Department.

5.1.13 Access Management

The construction of the additional general-purpose lanes along I-10 (SR 8) will not change the access classification or interchange spacing. I-10 (SR 8) will continue to be classified as “Limited Access Highway, Class 1”.

5.1.14 Cost Estimates

Preliminary construction cost estimates were established using the FDOT Long Range Estimate (LRE) program. **Table 5-14** presents a summary of the estimated costs for the Recommended Alternative for I-10 (SR 8) from I-295 and I-95. The FDOT Long Range Estimates (LRE) were completed for this project and are provided in **Appendix I.** Design cost and Construction Engineering and Inspection (CEI) cost was assumed to be 10% and 12% of the construction cost estimate, respectively. Wetland mitigation was assumed to be $110,000 per acre.

Table 5-14. Cost Estimate – I-10 (SR 8)

Description	Recommended Alternative Costs ($-millions)
Estimated Construction Costs	$125,000,000
Engineering/Design Costs (10% of Construction)	$12,500,000
CEI (12% of Construction)	$15,000,000
Estimated Right of Wat Costs	$0
Wetland Mitigation Costs	$2,125,200
TOTAL COST	**$154,625,200**

5.1.15 Value Engineering

A Value Engineering (VE) Study was held, during April 3 – 7, 2017 using the VE methodology to improve a PD&E Study. The objective of the VE Study was to identify opportunities and propose recommendations that may improve value in terms of capital cost, constructability, maintenance of traffic, and the basic functional requirements of the project.

The objective of this evaluation was to identify ideas with the most promise to achieve savings while preserving functions or improving operations

The VE team prepared a VE Study Report that documented the value engineering analysis performed related to the planned project improvements.

The design suggestions identified by the VE team are presented for FDOT's consideration. No specific action is normally required to accept or not accept the suggestions, though it is often helpful, for documentation purposes, to formally list those suggestions that will be acted upon by FDOT. A summary of the VE Study recommendations are provided in the VE Report prepared for this project and is provided in **Appendix J**.

5.2 Environmental Impacts of the Recommended Alternative

This section provides the results of the analysis of the potential beneficial or adverse impacts of the project's Recommended Alternative and No Build Alternative. The project is evaluated with respect to transportation, social, economic, cultural, physical, natural, and biological resources as part of the PD&E Study. Information used to conduct the evaluation includes detailed studies completed for this PD&E and comments received from Environmental Technical Advisory Team (ETAT) members through the Efficient Transportation Decision Making (ETDM) process. A program level ETDM screening was published for I-10 (SR 8) from I-295 and I-95, ETDM #14275, dated November 18, 2016. Through ETDM, early agency and public comments were obtained to identify project related issues and potential environmentally sensitive areas. The ETDM Programming Summary Reports are also available on the ETDM public website https://etdmpub.fla-etat.org/est/#.

The project was initially evaluated for the deployment of express lanes along the eastbound and westbound I-10. I-10 within the project limits has minimal ROW available for expansion and is located between two historic districts. This precluded FDOT from adding the additional lanes as express lanes because motorists weaving to enter and exit an express lane system would degrade the operations of the mainline general-purpose lanes. Building laced flyovers to remove the weave was not feasible due to cost constraints and significant impacts to the historic district. This resulted in a length where a safe weave could be accommodated, at-grade, in only a 1.0 mile eastbound and 1.7 miles westbound express lane system which offers little incentive to users. Owing to these reasons, after initial planning efforts, the project was converted into a general-purpose lane capacity improvement project

The proposed improvements along I-10 (SR 8) from I-295 east to I-95 along with the interchange operational improvements at Lane Avenue (SR 103) and Cassat Avenue (SR 111) are included in the impact analyses discussed in this section. Proposed stormwater pond sites located outside the existing ROW are included. Several resources discussed in the following sections have been evaluated in individual technical documents and are incorporated by reference or appended to this document.

5.2.1 Social and Economic

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations (59 Federal Register 7629 1994), and FHWA Order 6640.23A, FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, require federal agencies to determine whether a proposed action would have an adverse and disproportionately high impact on minority and/or low-income populations.

5.2.1.1 Social

Population

Data from the 2015 American Community Survey (ACS) 5-Year Estimates were collected for the census tracts located within a 500-foot project area buffer. Census tract data within the buffer area was examined to identify the presence or absence of minority populations and to identify potential disproportionate impacts. Total and minority population data is presented in **Table 5-15**.

The demographic information indicates a minority population of 8,473 individuals comprising approximately 37 percent of the population within the project buffer area. Within this population are 1,728 persons (8 percent) identified as Hispanic.

Table 5-15. Total and Minority Population

Geographic Area	Total Pop.	Not Latino or Hispanic							Hispanic or Latino of Any Race
		White	Black / African American	AIAN	Asian	NHPI	Other Race	Two or More Races	
Census Tract 25.01	3,952	2,104	1,524	94	54	0	34	142	485
Census Tract 25.02	3,555	2,585	553	12	36	0	0	369	103
Census Tract 26	3,076	425	2,637	0	0	0	9	5	54
Census Tract 120	5,391	3,647	1,381	35	34	15	72	207	433
Census Tract 121	1,657	1,104	391	0	36	0	0	126	239
Census Tract 171	5,341	4,634	512	24	33	0	65	73	414
TOTAL	**22,972**	**14,499**	**6,998**	**165**	**193**	**15**	**180**	**922**	**1,728**
TOTAL Percent	100	63	30	.7	1	.5	.8	4	8

Source: U.S. Census Bureau, 2015 American Community Survey (ACS) 5-Year Estimates

Income and Poverty Status

Census tract data was also evaluated for low-income populations. The median household income and households below the poverty status were examined to identify the presence or absence of low-income populations in the project buffer and identify potential disproportionate impacts. The poverty level was determined based on the 2017 U.S. Department of Health and Human Services poverty threshold of $24,600 for a family of four. **Table 5-16** presents the estimated number of households, median household income, and households below the poverty level within buffer area census tracts.

The No-Build and Build Alternatives proposed would not have a disproportionate impact on low-income populations.

Table 5-16. Median Household Income and Poverty Status

Geographic Area	Total Households	Median Household Income (dollars)	Households Below Poverty	
			Number	Percent of Census Tract Total Households
Census Tract 25.01	1,678	$26,267	506	30
Census Tract 25.02	1,554	$49,026	190	12
Census Tract 26	1,125	$18,284	557	50
Census Tract 120	1,900	$50,685	215	11
Census Tract 121	579	$27,118	202	35
Census Tract 171	3,026	$41,935	496	16
TOTAL	**9,862**		**2,166**	**32**

Notes:
(1) Geographic Area was determined to be the 2015 Census Tracts within the project area buffer.
(2) Households below the poverty level were determined based on 2015 American Community Survey 5-Year Estimates and 2017 U.S. Department of Health and Human Services poverty threshold of $24,600 for a family of four.

Limited English Proficiency (LEP)

Data from the 2015 ACS 5-Year Estimates were reviewed for language spoken at home by ability to speak English for the population 5 years and above. Within the project buffer, approximately 6 percent of the population 5 years old and above speaks English "less than very well." Demographic data indicates that approximately 1 percent of the population within the project area buffer speak a language other than English.

As part of the project's Public Involvement Plan (PIP), accommodations were made to ensure compliance with Title VI of the U.S. Civil Rights Act of 1964, and other related statutes. Informational materials, such as newsletters and fact sheets, were developed in bilingual format as well as advertisements of public meetings upon the FDOT's request and approval.

The Build Alternative would not have an impact on LEP populations within or adjacent to the project buffer area.

It is anticipated that the proposed Build Alternative will not have a disproportionally high and adverse effect on minority and low-income populations. It is also anticipated that the Build Alternative will not raise environmental justice issues.

Community Services

Community services located within the vicinity of the I-10 project area include two elementary schools, two parks, one community center, 15 churches, and one historic district.

No adverse impacts to community facilities and services are anticipated as a result of the Build Alternative. With the Build Alternative, there will be temporary impacts in the form of noise, dust, emissions, and traffic disruptions during construction, but traffic will be maintained. Many of the effects to the adjacent and surrounding communities are anticipated to be positive as they will facilitate access to the existing community services for the residents, commuters, and service providers.

5.2.1.2 Economic

The project segment of the I-10 corridor serves major east-west movement through the City of Jacksonville and western Duval County. Land use located within the project area includes office, commercial, light industrial, and residential areas. Along with the expected 24 percent population increase (from 2010 to 2040) for Duval County, employment is expected to increase by 23 percent during the same period. The study area is located within a City of Jacksonville Enterprise Zone and a U.S. Department of Housing and Urban Development (HUD) Empowerment Zone, both of which encourage economic growth and revitalization.

The proposed Build Alternative improvements support the City of Jacksonville's Future Land Use Element and policies along with Transportation Element Policy 1.5.1 which seeks to decrease automobile travel on or encourage the efficient use of the SIS and other State Highway Systems. The Build Alternative also supports Goal 3, which seeks to increase total roadway network capacity by adding new lane-miles to the existing roadway network when necessary to ensure the safe, efficient movement of persons and goods.

Benefits associated with the Build Alternative include reduced congestion, increased traffic flow, and increased accessibility. The potential for expansion of existing businesses along the corridor or development of new business will be encouraged to improve the economic environment within and adjacent to the project area.

Environmental Justice

The Study Area was examined to determine if the proposed project would disproportionally affect minority and low-income populations. Data from the 2015 American Community Survey (ACS) 5-Year Estimates were collected for the census tracts located within a 500-foot project area buffer. Census tract data within the buffer area was examined to identify the presence or absence of minority populations and to identify potential disproportionate impacts. The demographic information indicates a minority population of approximately 37 percent within the project buffer area.

In addition, the median household income and households below the poverty status were examined to identify the presence or absence of low-income populations and identify potential disproportionate impacts. The poverty level was determined based on the 2017 U.S. Department of Health and Human Services poverty threshold of $24,600 for a family of four. The household income data indicates approximately 32 percent of all households within the project area buffer are below poverty.

Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency (LEP) (2001), requires federal agencies to work to provide meaningful access to LEP applicants and beneficiaries. Data from 2015 American Community Survey 5-Year Estimates were reviewed for language spoken at home by ability to speak English for the population 5 years and above within the project buffer. Approximately 6 percent of the population 5 years old and above speaks English "less than very well." Demographic data indicates that approximately 1 percent of the population within the project area buffer speak a language other than English.

The proposed project is not anticipated to require additional ROW. To minimize property impacts, capacity improvements along I-10 (SR 8) and improvements at Lane Avenue (SR 103) and Cassat Avenue (SR 111) are located within existing FDOT ROW. The proposed stormwater pond sites are located on lands currently owned by the FDOT or the City of Jacksonville and do not require additional ROW acquisition.

Based on the Recommended Alternative improvements, it is anticipated that the project will not have a disproportionally high and adverse effect on minority and low-income populations. It is anticipated that neither the Recommended Alternative nor No Build Alternative will raise environmental justice issues.

5.2.1.3 Land Use Changes

The proposed improvements associated with the Build Alternative are compatible with the City of Jacksonville's Comprehensive Plan and supports the plan's Future Land Use Element. According to the 2030 Comprehensive Plan Future Land Use Map (Figure 5-3) the project area will remain urbanized with predominantly light industrial, community/general commercial, neighborhood commercial and high-density residential land uses. The Future Land Use Element identifies the Urban Priority Area (UPA) and Urban Area (UA) development areas within the project area. The UPA includes the historic core of the City and major connecting corridors. The UA corresponds with the densely developed portions of the City that have been in residential or employment-generating land uses prior to City-County consolidation and includes major connecting corridors.

The proposed improvements associated with the Build Alternative are not anticipated to significantly affect land use in the area. The character of the study area remains unchanged and will continue to support the existing and future land uses within the project and surrounding area maintaining the goals of the City of Jacksonville Future Land Use Map.

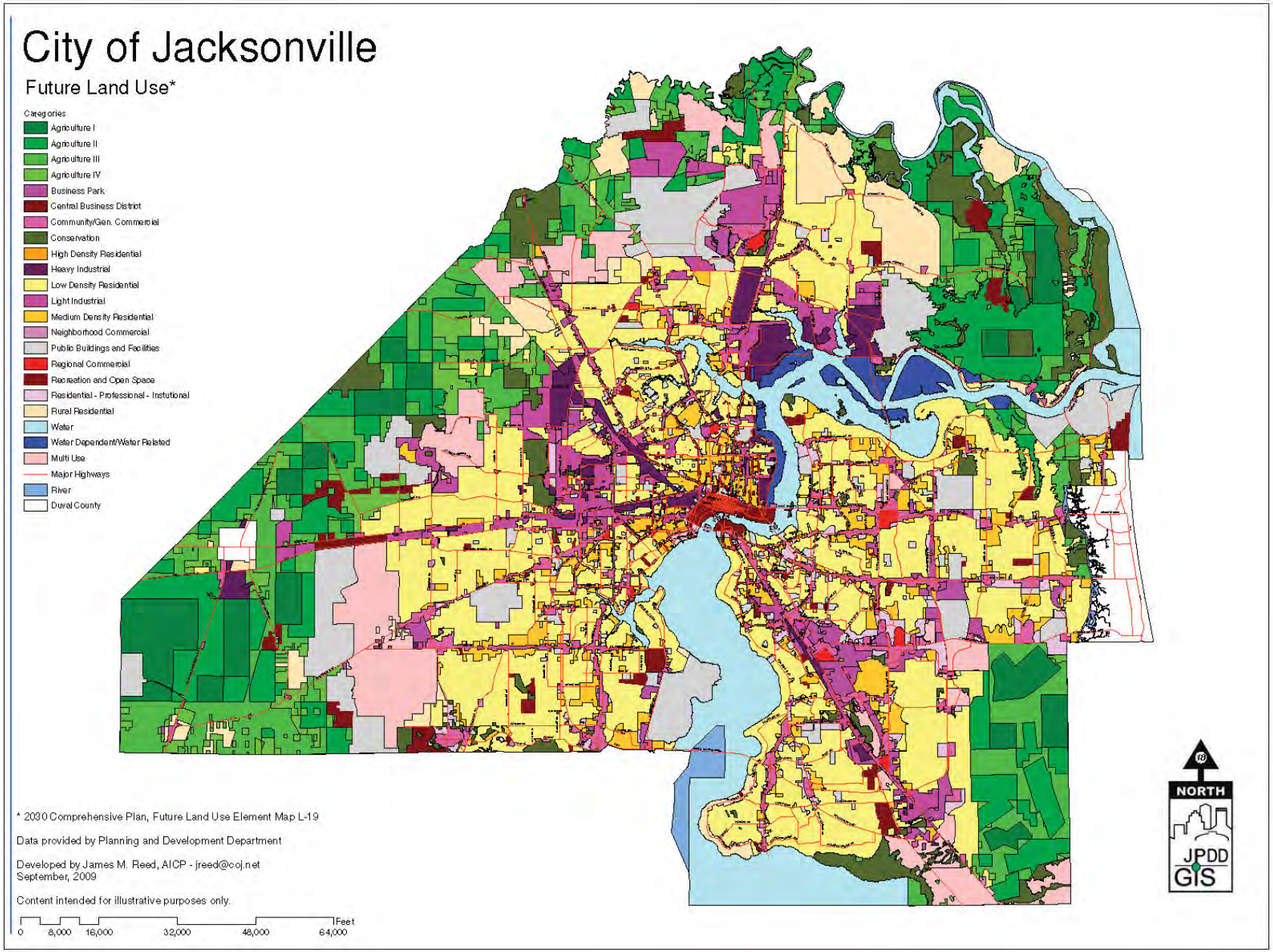


Figure 5-3. Duval County 2030 Comprehensive Plan Future Land Use Map

5.2.1.4 Mobility

The proposed Build Alternative will reduce congestion, improve local and regional mobility, and accommodate expanding commercial, light industrial, and residential uses within the vicinity of the project area while supporting the vision of both Duval County and the City of Jacksonville.

5.2.1.5 Aesthetics

The proposed Build Alternative is compatible with future residential and commercial land uses within the project area because the interstate already exists. The project and surrounding area is developed and urban in nature and aesthetic effects are anticipated to be minimal. Transportation is the predominant land use within the project area with adjacent uses including commercial, light industrial, institutional, and scattered residential. There are no Scenic Highways/Byways within the project area and vicinity.

5.2.1.6 Relocation Potential

The proposed Build Alternative including stormwater pond sites are constructed on lands currently owned by FDOT or City of Jacksonville; therefore, no relocations or private ROW acquisition are anticipated.

The proposed project, as presently conceived, will not displace any residences or businesses within the community. Should this change over the course of the project, the Florida Department of Transportation will carry out a ROW and Relocation Program in accordance with Florida Statute 339.09 and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646 as amended by Public Law 100-17). The brochures that describe in detail the FDOT's Relocation Assistance Program and ROW acquisition program are "Residential Relocation Under the Florida Relocation Assistance Program", "Relocation Assistance Business, Farms and Non-profit Organizations", "Sign Relocation Under the Florida Relocation Assistance Program", Mobile Home Relocation Assistance", and "Relocation Assistance Program Personal Property Moves". All of these brochures are distributed at all public hearings and made available upon request to any interested persons.

5.2.1.7 Farmlands

The project has no involvement with farmlands.

5.2.2 Cultural Resources

In accordance with FDOT PD&E Manual Part 2, Chapter 7 Section 4(f) (June 14, 2017) and Chapter 8 Archaeological and Historical Resources (June 14, 2017), a Phase I Cultural Resource Assessment Survey (CRAS) was conducted for the project. The purpose of the survey was to locate, identify, and bound any determined or potentially eligible resources within the project's Area of Potential Effect (APE) which was defined to include the proposed pond footprints with an additional 100-foot buffer around each pond. A screening survey was completed for the I-10 Mainline as improvements are limited to the existing ROW. Due to extensive modern development, urban soils present within the corridor, and lack of potential for the improvements to affect significant historic structures or archaeological sites, no further work for the I-10 Mainline was recommended.

5.2.2.1 Section 4(f)

Through the ETDM EST, a moderate DOE was assigned to Section 4(f) resources. While Section 4(f) resources are in proximity to the project area, direct impacts to these resources are not anticipated and no mitigation would be needed.

Section 4(f) of the Department of Transportation Act of 1966 as amended established the requirement for avoidance of parks and recreational lands, wildlife and waterfowl refuges, and historic sites of national, state, or local significance. To determine applicability, Section 4(f) is applied to a property that represents a significant publicly owned park or recreation area, wildlife or waterfowl refuge, or historic property. (FDOT PD&E Manual, Part 2, Chapter 7, June 14, 2017).

No Section 4(f) resources are located within or immediately adjacent to the project area, therefore, Section 4(f) does not apply.

5.2.2.2 Historic Sites/Districts

The architectural survey resulted in the identification and evaluation of 17 historic resources within the I-10 corridor and pond site alternatives APE, including eight previously recorded historic resources and nine newly recorded historic resources. The previously recorded resources include one historic bridge (8DU11915), one resource group (8DU21755), and five historic structures (8DU12008, 8DU21327, 8DU21329, 8DU21330, and 8DU21620). The newly recorded resources include one historic linear resource (8DU22144) and eight historic structures (8DU22136-8DU22143). The field survey confirmed that nine previously recorded historic structures located within the I-10 pond site alternatives APE (8DU00219, 8DU07848, 8DU07849, and 8DU07881-8DU07886) have been moved or demolished.

Based on the results of the survey, the South Myrtle Avenue-McCoy's Creek Bridge (8DU11915) and the McCoy's Creek Improvement Project Bridge resource group (8DU21755) remain NRHP-eligible. The South Myrtle Avenue-McCoy's Creek Bridge (8DU11915), in addition to being individually eligible, remains eligible as a contributing resource to Resource Group 8DU21755. The 14 remaining resources lack the historical significance and architectural or engineering distinction necessary for listing in the NRHP and are recommended ineligible, individually or as contributors to a historic district.

The State Historic Preservation Office (SHPO) concurred (Appendix B) with the findings presented in the CRAS on November 7, 2017, specifically that the South Myrtle Avenue-McCoy's Creek Bridge (8DU11915) and the McCoy's Creek Improvement Project Bridge resource group (8DU21755) remain NRHP-eligible. Improvements associated with the Build Alternative will have no effect on NRHP-listed or -eligible historic resources. No further work is recommended.

5.2.2.3 Archaeological Sites

The archaeological research strategy was composed of background investigation, a historical document search, and field survey of the proposed pond site locations. Based on an examination of environmental variables (soil drainage, relative elevation, and access to marine resources), as well as the results of previously conducted surveys, project study area APE was considered to have low potential for prehistoric archaeological sites. The APE contains disturbed urban soils and modern development. The APE was considered to have low potential for historic archaeological sites due to the level of disturbance within the ROW.

Archaeological reconnaissance was conducted within the existing and proposed pond ROW. The pond locations were visually examined via pedestrian survey for the presence of exposed artifacts and above-ground features (e.g., structural remains and prehistoric mounds). The Phase I field survey consisted of subsurface shovel testing within the proposed pond footprints at varying intervals according to the potential for containing buried archaeological sites.

Twenty-three shovel tests were dug within the pond site alternatives APE. The results of the investigation are summarized here and presented in **Table 5-17**. Nine of the 14 shovel tests completed for pond site MC-3 were positive for cultural material. Intact sediments were encountered in the vicinity of pond site MC-3, while soils in the remainder of the APE typically exhibited poor drainage or a high degree of subsurface disturbance. The positive shovel tests in pond site MC-3 resulted in the recording of the West Duval Street Site (8DU22134), based on the recovery of historic period artifacts. No additional artifacts were found during pedestrian survey or recovered by any of the other shovel tests. Two shovel tests dug within pond site MC-2 were negative for cultural material. The remaining pond sites: CR-1, CR-2, CR-3, and MC-1 are existing pond sites and no further work was required.

Due to the presence of intact stratigraphy yielding diagnostic cultural material, the West Duval Site (8DU22134) was identified as potentially NRHP eligible under Criterion D. The site is currently enclosed by a fence along the northwestern boundary and represents the recommended avoidance boundary. The remaining portions of Pond MC-3 to the west of the fence have been heavily modified and are recommended clear for pond construction activities. The design plans will avoid any impact to the West Duval Site (8DU22134).

No archaeological sites or archaeological occurrences were noted within the I-10 from I-295 to I-95 ROW. Based on the heavily disturbed nature of the soils within the I-10 from I-295 to I-95, there is low potential for intact archaeological sites to be present and no further archaeological work is recommended.

The SHPO concurred with the findings of the archaeological survey on November 7, 2017.

Table 5-17. Pond Site Cultural Resource Investigation Results

Pond Site ID	Pond Footprint (Acres)	Number of Shovel Tests	Comments	Recommendations
CR-1	5.86	0	Existing pond	No further work
CR-2	0.52	0	Pond footprint inundated with water	No further work
CR-3	14.2	0	Existing pond	No further work
MC-1	3.4	0	Existing pond	No further work
MC-2	1.78	2	All shovel tests negative	No further work
MC-3	1.79	14	Nine shovel tests positive	8DU22134 recorded; avoidance of site boundaries recommended or further investigation necessary if site cannot be avoided. Western side of the pond is disturbed, and no further work recommended.

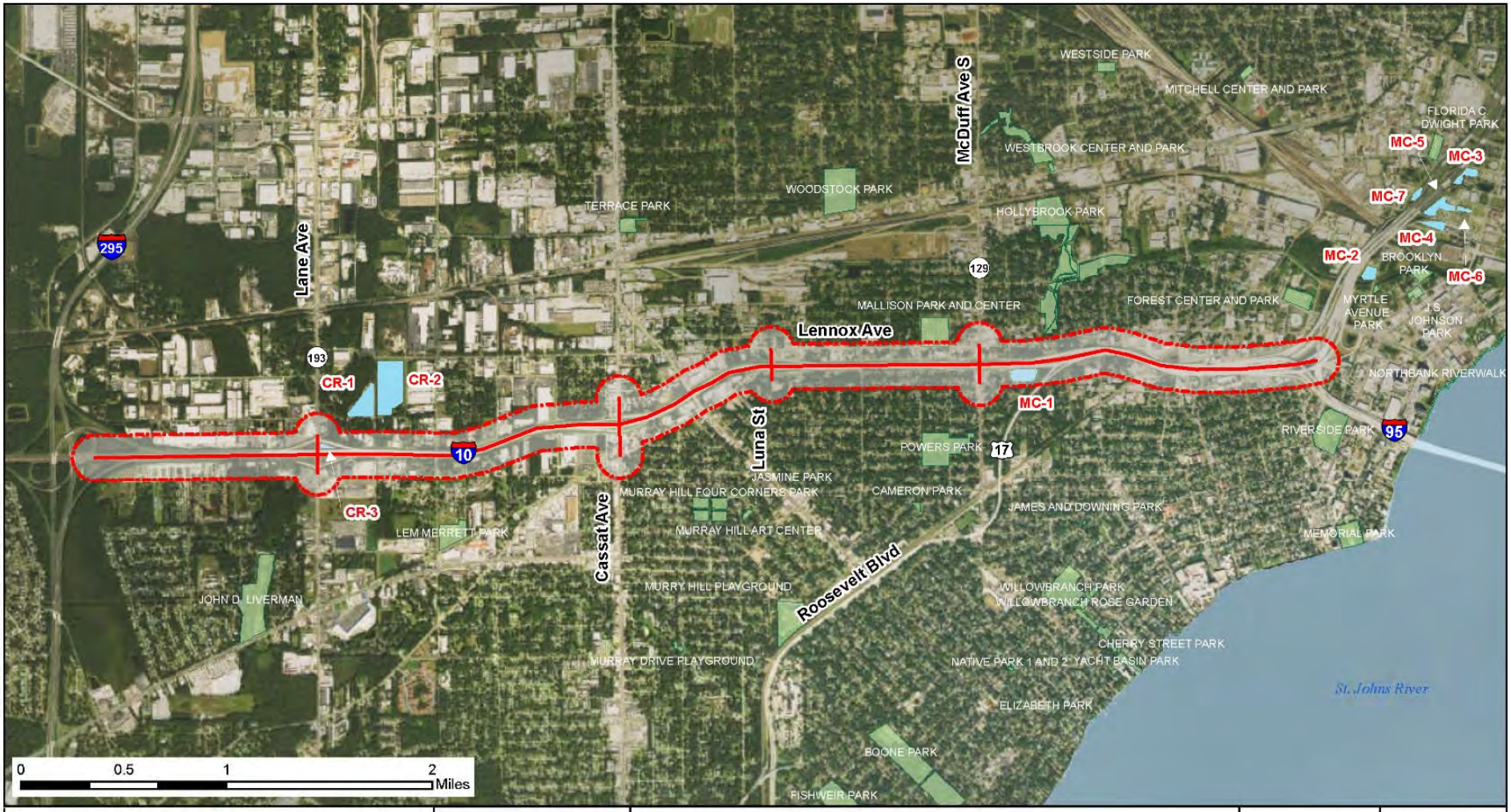
Pond Site ID	Pond Footprint (Acres)	Number of Shovel Tests	Comments	Recommendations
MC-4	1.52	0	Pond footprint is an existing parking lot	No further work
MC-5	2.84	7	Majority of pond footprint is an existing parking lot; previously recorded 8DU17727 encountered. Phase II investigations of site were conducted in 2006.	Site is ineligible for NRHP; no further work
MC-6	0.76	0	Pond footprint is an existing parking lot.	No further work
MC-7	0.78	0	Majority of proposed pond footprint includes existing pond	No further work

5.2.2.4 Recreation Areas

Through the ETDM EST, a minimal DOE was assigned by the FDOT. The National Park Service assigned a No Involvement DOE.

No resources are located within the 500-foot project area buffer. Mallison Park is located just outside the 500-foot buffer area limits (**Figure 5-4**). No direct or constructive use of Mallison Park will occur as a result of the proposed project improvements.

Neither the Recommended Alternative nor the No Build Alternative will impact recreation areas.



PD&E Study
I-10 (State Road 8) from I-295 to I-95
Duval County
ETDM No. 14275
FM No. 213326-2-22-01

PARKS AND RECREATION AREAS

Project Area
500 ft. Buffer
Parks and Recreation Areas
Potential Ponds

N

FIGURE
5-4

5.2.3 Natural Resources

5.2.3.1 Wetlands and Other Surface Waters

A Natural Resource Evaluation (NRE) technical memorandum was completed in accordance with FDOT PD&E Manual, Part 2, Chapter 9, Wetlands and Other Surface Waters (June 14, 2017) and Executive Order 11990, Protection of Wetlands (1977). The NRE was completed to document and present the findings of potential wetland involvement associated with proposed improvements and is on file with the FDOT District Two PLEMO.

Identification and assessment of wetlands and surface waters within and adjacent to the project area was completed. Project area wetlands water are shown in **Figure 5-5.** Field investigations were performed to evaluate the presence of wetland vegetation, hydric soils, and hydrologic indicators within the I-10 (SR 8) corridor and stormwater pond site locations. Potential wetland impacts within the I-10 (SR 8) project corridor are located near the I-95/I-295 interchange and are anticipated to be minimal. A summary is provided in **Table 5-18**.

Table 5-18. Summary of Estimated Permanent Wetland Impacts for I-10

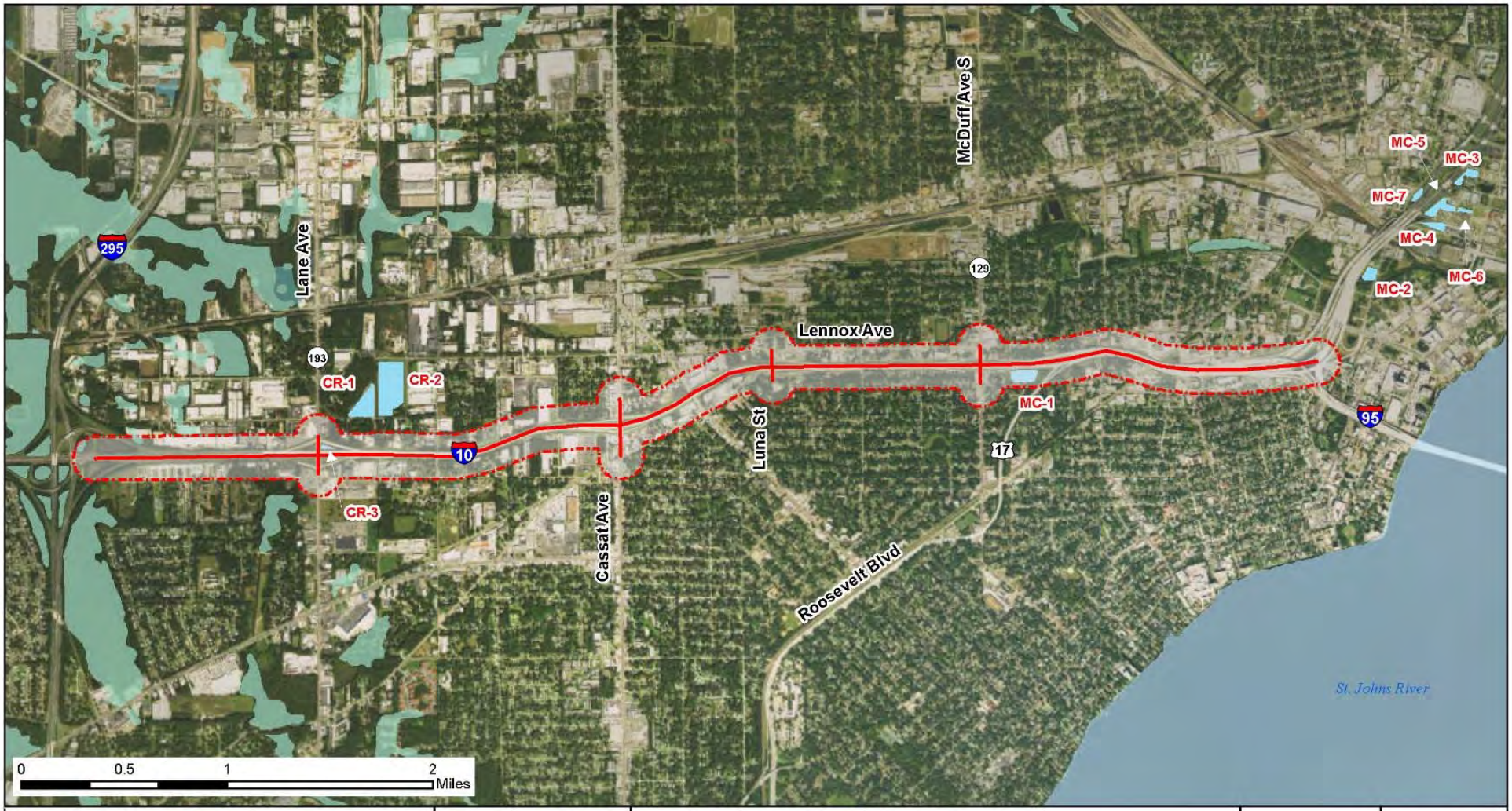
Location	Habitat (FLUFCS)	Wetland (Acres)
I-10	Stream and Lake Swamp	0.55
I-10	Mixed Hardwood Wetlands	13.67
I-10	Cattail	4.84

Source: NRE Technical Memorandum

Proposed stormwater pond site alternatives are located near, but not necessarily immediately adjacent to I-10 (SR 8). A pond site alternatives screening analysis was completed for potential pond sites MC-1 through MC-7 and CR-1 through CR-3 and are shown on **Figure 5-5**. Potential impacts associated with each of the pond site alternatives are presented in **Table 5-19**.

Table 5-19. Summary of Pond Site Potential Wetland Impacts

Pond Site ID	Wetland (Acres)	Comments
CR-1	-	Existing stormwater pond
CR-2	0.09	Existing stormwater pond
CR-3	-	Grass area
MC-1	-	Existing stormwater pond and partial wooded area
MC-2	0.17	Grass area and partial wooded area
MC-3	-	Partial wooded area including N. Stuart Street
MC-4	-	Existing parking lot
MC-5	-	Existing stormwater pond, parking lot grass area, including portions of Houston and Cleveland Streets
MC-6	-	Existing parking lot
MC-7	-	Existing stormwater pond



PD&E Study
I-10 (State Road 8) from I-295 to I-95
Duval County
ETDM No. 14275
FM No. 213326-2-22-01

WETLANDS

Project Area
500 ft. Buffer
Potential Ponds

Wetland Type
FRESHWATER FORESTED/SHRUB WETLAND
FRESHWATER EMERGENT WETLAND

N

FIGURE
5-5

Jurisdictional determinations and mitigation requirements will be completed during the permitting process as wetlands are subjected to further study, delineated, verified, and surveyed during final design. Potential stormwater ponds that occur within existing pond sites are components of permitted stormwater management systems, and as such will not be considered jurisdictional wetlands by the regulatory agencies. Mitigation will not be required for impacts to existing ponds. Upland-cut ditches that occur within some pond sites are also unlikely to require mitigation if impacted.

FDOT is committed to the mitigation of all wetland impacts required by regulatory agencies that may result from the project. The amount and type of mitigation required will be identified and negotiated with all applicable regulatory agencies when the project enters the design and permitting phase. If mitigation is required, FDOT will employ various strategies to fulfill mitigation needs for wetland impacts resulting from the construction of the proposed project. These strategies may include the use of approved mitigation banks or restoration, enhancement, preservation, and/or creation of wetlands, either on or off-site. Any mitigation proposed will be completed in compliance with, and to the satisfaction of, all state and federal regulatory requirements.

The project has been evaluated to assure the protection, preservation, and enhancement of the Nation's wetlands to the fullest extent practicable during the planning, construction, and operation of transportation facilities and projects. During the design phase, permits and other authorizations will be required from the USACE and SJRWMD due to anticipated surface water impacts.

It is anticipated the following permits will be required during the design phase:

- Dredge & Fill Permit – U.S. Army Corps of Engineers
- Environmental Resource Permit – St. Johns River Water Management District
- National Pollutant Discharge Elimination System– Florida Department of Environmental Protection

5.2.3.2 Water Quality and Quantity

The project study area is located within the McCoy Creek and Cedar River basins discharging into the Lower St. Johns River basin. The Willow Branch, Cedar River, McCoy Creek, St. Johns River, and Big Fish Creek surface waters are located within a 100-foot project area buffer. All waterbodies are designated impaired Florida waters except Willow Branch.

Increased storm water runoff and discharge due to increased impervious areas is anticipated. These increases will require increased stormwater management capacity because of the project. The proposed improvements are to an existing roadway facility, therefore, significant hydrological and water quality (e.g., chemical, physical, and biological properties) impacts are not expected to occur.

The SJRWMD regulates stormwater discharge and typically requires an individual ERP for this type of project. The SJRWMD has also been delegated the authority to regulate impacts to isolated wetlands and wetlands connected to waters of the State.

A Water Quality Impact Evaluation (WQIE) was completed for the project to comply with the Clean Water Act and the Safe Drinking Water Act. The results of the WQIE indicate that the project will not result in significant impacts to water quality. Stormwater treatment facilities will be designed in accordance with applicable state and local regulations.

Within the McCoy Creek Basin stormwater runoff treatment will provide an overall reduction in nitrogen and phosphorus pollutant loading within the basin. Within the Cedar River Basin, existing roadway impervious area that is currently untreated will be treated with stormwater management improvements associated with the I-10 (SR 8) from I-295 to I-95 improvements.

To meet SJRWMD water quality criteria the following shall be met within the McCoy Creek Basin:

- FDOT owned sites along I-95 north of McCoy Creek will be used as pond sites to treat stormwater runoff from I-95 within the McCoy Creek basin
- Changes to the existing stormwater conveyance systems will be required to convey stormwater to the proposed pond sites
- Because McCoy Creek discharges into the St. Johns River, which is impaired, calculations would be required showing peak discharge form pond is less than 10% of McCoy Creek base flow to demonstrate no direct discharge into the St. Johns River

To meet SJRWMD water quality criteria the following shall be met within the Cedar River Basin:

- Changes to the existing pond size and depth will be required to provide required compensatory treatment associated with the additional impervious area resulting from the I-10 (SR 8) widening improvements
- Calculations must meet SJRWMD requirements for compensatory treatment of the additional impervious area
- The existing pond was permitted with a pond liner to prevent impacts to adjacent wetlands

An evaluation of potential pond site locations was completed following the District Two pond siting procedures. This included identification of pond site locations and screening. The results of the pond siting process identified parcels currently owned by FDOT or the City of Jacksonville. The sites can accommodate a large amount of runoff to meet compensatory treatment requirements, have desirable outfalls, and do not require the acquisition of additional property.

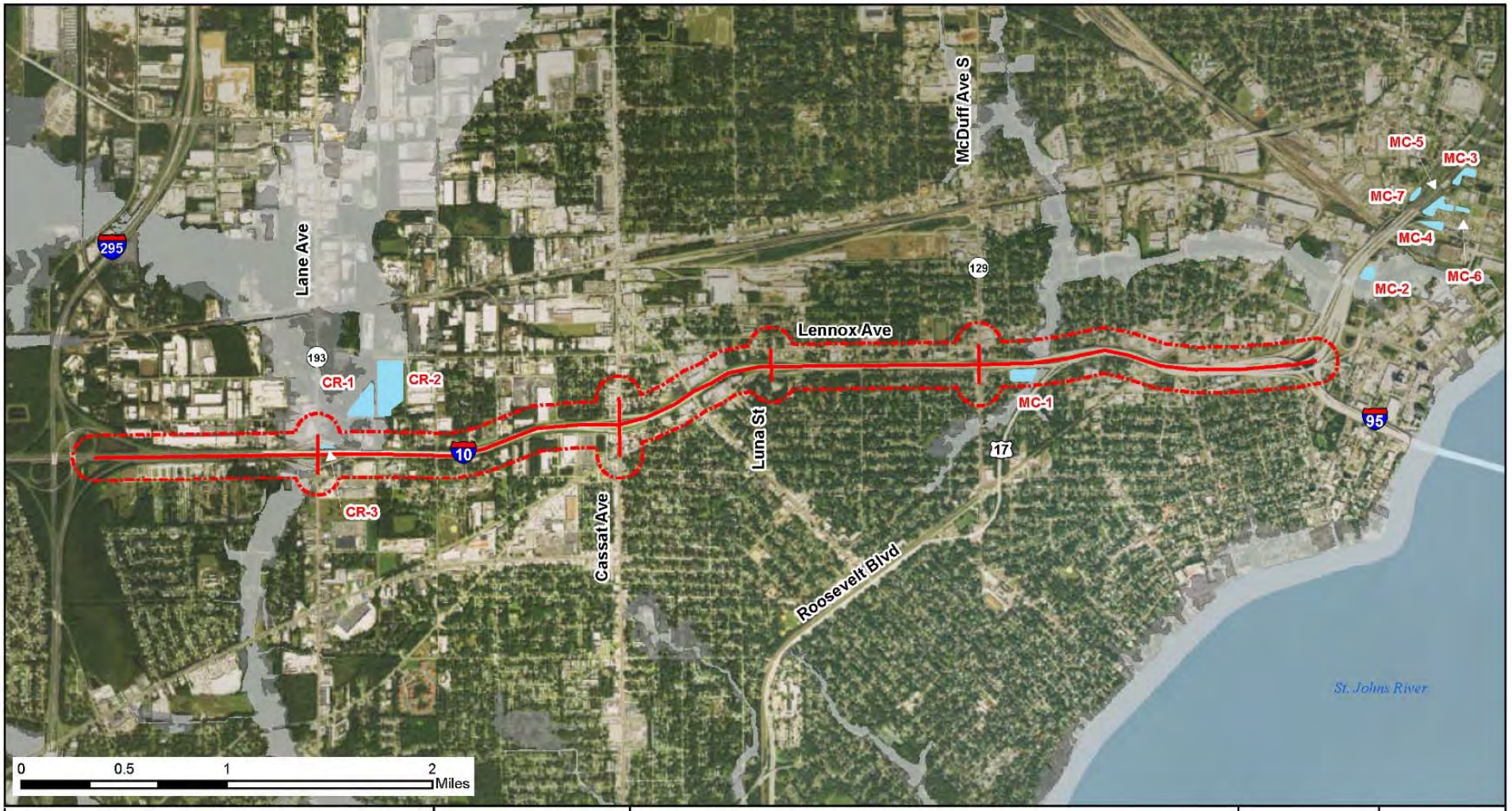
Pond site location recommendations are based on preliminary data calculations, reasonable engineering judgment, and assumptions along with the results of the pond screening analysis. Pond sizes and locations may change during final design as more detailed information becomes available.

5.2.3.3 Floodplains

Special Flood Hazard Areas (SFHA) are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are Zone X, unshaded.

Review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) numbers 12031C0334H, 12031C0353H, 12031C0354H, and 12031C0358H for the project area show I-10 (SR 8) from I-1295 to I-95 passing through Zone X. Zone X encompasses areas of minimal flooding. The floodplain boundaries and associated information are shown in **Figure 5-6**.

Areas adjacent to the Cedar River and McCoy Creek which flow under I-10 (SR 8) have a SFHA zone designation of AE. Zone AE encompasses areas having a 1-percent chance flood of being equaled or exceeded in any given year.



PD&E Study
I-10 (State Road 8) from I-295 to I-95
Duval County
ETDM No. 14275
FM No. 213326-2-22-01

FLOODPLAINS

Project Area
500 ft. Buffer
Potential Ponds

FLOODPLAIN
100-YEAR FLOODPLAIN
500-YEAR FLOODPLAIN

N

FIGURE
5-6

This project involves some work within the horizontal limits of the 100-year floodplain near the Lave Avenue (SR 103) and Roosevelt Boulevard (US 17) interchanges. The proposed roadway and drainage changes will cause minimal increases in flood heights and flood limits. These minimal increases will not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant change in flood risks or damage. There will not be a significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.

5.2.3.4 Protected Species and Habitat

Through the ETDM EST, a moderate DOE was assigned by the USFWS. The Florida Fish and Wildlife Conservation Commission (FFWCC) assigned a minimal DOE and SJRWMD assigned a DOE of none. The project area is located within the Lower St. Johns River Ecosystem Management Area, USFWS wood stork Core Foraging Area (CFA), and Eastern indigo snake species range. The FFWCC did not identify any significant fish, wildlife, or habitat resources within the project area.

Table 5-20 summarizes listed wildlife species with the potential to occur within the vicinity of the project area based on the project locations and availability of suitable habitat.

Table 5-20. Listed Wildlife Species and the Potential to Occur within the Project Area & Vicinity

Scientific Name	Common Name	Status	Likelihood of Occurrence
Birds			
Mycteria Americana	Wood Stork	FT	Moderate
Haliaeetus leucocephalus	Bald Eagle	---	Low
Mammals			
Trichechus manatus	West Indian Manatee	FT	No Involvement
Reptiles			
Drymarchon corais couperi	Eastern Indigo Snake	FT	Low

Legend: SSC = Species of Special Concern; ST = State-designated Threatened; FT = Federally-designated Threatened; T = Threatened; FE = Federally-designated Endangered; E = Endangered

Source: Florida Fish and Wildlife Conservation Commission. Florida's Endangered and Threatened Species. Official Lists; U.S. Fish and Wildlife Service, County Listed Species

Due to minimal involvement with protected species and habitat, a technical memorandum was completed to document and present the findings of potential protected species and habitat impacts associated with proposed improvements along I-10 (SR 8) from I-295 east to I-95, at Lane Avenue (SR 103), Cassat Avenue (SR 111), and the stormwater pond sites. The NRE documenting ESBA was completed in compliance with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.), 50 CFR Part 202 and in accordance with FDOT PD&E Manual, Part 2, Chapter 16, Protected Species and Habitat (June 14, 2017). The NRE technical memorandum is on file with the FDOT District Two PLEMO.

Neither the Recommended Alternative nor the No Build Alternative are expected to have impacts to listed species as part of his project. No cumulative impacts to the project area or pond site locations are anticipated due to the urban nature of the project area.

5.2.3.5 Essential Fish Habitat

Through the ETDM ETS, the NMFS indicated proposed improvements located within the project area would not directly impact areas that support essential fish habitat (EFH), National Oceanic and Atmospheric Administration (NOAA) trust fishery resources, or wetland areas that support NOAA trust fishery resources. The NMFS concluded that this project will not require an EFH assessment. Further consultation with the NMFS is not necessary unless future modifications to the project could result in adverse impacts to EFH.

5.2.4 Physical Resources

5.2.4.1 Highway Traffic Noise

A traffic noise study was completed in accordance with the FDOT PD&E Manual, Part 2, Chapter 18, Highway Traffic Noise (June 14, 2017) and Title 23 Code of Federal Regulations (CFR) Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise (July 2010). The primary objectives of the noise study were to document the methodology used to conduct the noise assessment, determine the existing site conditions including noise-sensitive land uses within the project study area, and assess the significance of traffic noise levels on noise-sensitive sites. The analyses were conducted for Recommended Alternative and No Build Alternative using FHWA Traffic Noise Model 2.5 (TNM 2.5). The evaluation of noise abatement measures for sites that approach or exceed the Noise Abatement Criteria (NAC) set forth by the FDOT and FHWA were also completed and was used for this evaluation. A Noise Study Report (NSR) was prepared for the project and is on file at the FDOT District Two PLEMO.

Noise, by definition, is unwanted sound that interferes with normal activities and would not be considered a resource, but rather a condition that potentially affects both the human and natural environment. Noise is perceived differently by every individual and is described in terms of loudness, frequency, and duration and is emitted from many sources, including airplanes, factories, railroads, power-generating plants, and highway vehicles). Highway noise, or traffic noise, is usually a composite of noises from engine exhausts, drive trains, and tire-roadway interaction.

The magnitude of noise is usually described by its sound pressure. Because the range of sound pressure varies greatly, a logarithmic scale is used to relate sound pressures to some common reference level, particularly the decibel. Sound pressures described in decibels are defined in terms of frequency-weighted scales. For a community noise impact assessment, the A-weighted scale is used almost exclusively in vehicle noise measurements because it places the most emphasis on the frequency characteristics that correspond to a human's subjective response to noise. Sound levels measured using A-weighting are often expressed as A-weighted decibels (dBA).

Noise Analysis

Within the project study area, a total of 389 noise sensitive sites were analyzed for impacts. The noise-sensitive sites identified in the immediate project area are a mixture of residential, commercial, light industrial and churches, parks and community centers.

Traffic noise impacts occur when the predicted traffic sound levels equal or exceed the FHWA NAC or when the predicted traffic sound levels exceed existing levels by 10 dBA. When traffic noise impacts are predicted, the traffic noise analysis should also include an evaluation of noise abatement measures for reducing or eliminating noise impacts.

For the project area, Existing Year (2016) and No Build (2045) traffic noise impact were predicted at 255 receptor sites. For the Recommended Alternative (2040), 322 impacted receptors with a nominal noise level increase of 1.6 dBA from the Existing Year (2016) condition were reported.

Noise Abatement

Twelve noise sensitive areas were identified within the project study area. FHWA and FDOT require that noise-abatement measures be evaluated when noise levels of a proposed roadway project approach or exceed NAC. Out of 389 analyzed noise sensitive receptor sites, eighty-five percent (312 receptors) are predicted to exceed the NAC. The feasibility and reasonableness of noise barriers were considered for 312 receptors.

Twenty-one noise barriers were evaluated to abate for the project traffic noise impacts. Of these, only two are both reasonable and feasible and recommended for further evaluation in final design. The location of the reasonable and feasible noise barrier locations is shown in **Figure 5-7**. A detailed discussion of where the noise abatement was considered for impacted sites is included in the Noise NSR completed for this PD&E Study.

5.2.4.2 Air Quality

The Recommended Alternative and No Build Alternative for the PD&E Study were screened for potential air quality impacts in accordance with the FDOT PD&E Manual, Part 2, Chapter 19, Air Quality (June 14, 2017) and using FDOT's screening model (CO Florida 2012, Version 1.01) to produce estimates of one-hour and eight-hour carbon monoxide (CO) at default air quality receptor locations. The one-hour and eight-hour estimates can be directly compared to the current one-and eight-hour National Ambient Air Quality Standards (NAAQS) for CO, 35 parts per million (PPM) and 9 PPM, respectively.

The roadway intersection selected for screening is typically the one with the worst-case combination of traffic volumes, low vehicular speeds, and closest receptors. The Recommended Alternative and No Build Alternative for the Open Year (2025) and the Design Year (2045) were evaluated. Based on the traffic study completed for the project, the I-10 (SR 8)/ Lane Avenue (SR 103) intersection was found to have the highest total approach traffic volume for the opening year (2025) scenario. The I-10 (SR 8)/ Cassat Avenue (SR 111) intersection was utilized for the design year (2045) scenario. The traffic data input used in the evaluation is provided in the Air Quality Technical Memorandum completed for this PD&E Study.

The project "passes" the screening model by achieving CO levels well below the one- and eight-hour NAAQS CO standards. The outputs from the CO Florida 2012 screening models are provided in the Air Quality Technical Memorandum on file at the FDOT District Two PLEMO. Air quality impacts due to construction operations for the proposed highway improvement project are expected to be short-term, minor, and localized.

To date, no national standards have been established regarding GHGs, nor has United States EPA established criteria or thresholds for ambient GHG emissions pursuant to its authority to establish motor vehicle emission standards for CO_2 under the Clean Air Act. FHWA has concluded, based on the nature of GHG emissions and the exceedingly small potential GHG impacts of the proposed action that the GHG emissions from the proposed action will not result in "reasonably foreseeable significant adverse impacts on the human environment" (40 CFR 1502.22(b)). The GHG emission from the project build alternatives will be insignificant, and will not play a meaningful role in a determination of the environmentally preferable alternative or the selection of the Recommended Alternative. For these reasons, no GHG analysis has been performed for the alternatives proposed for this project.

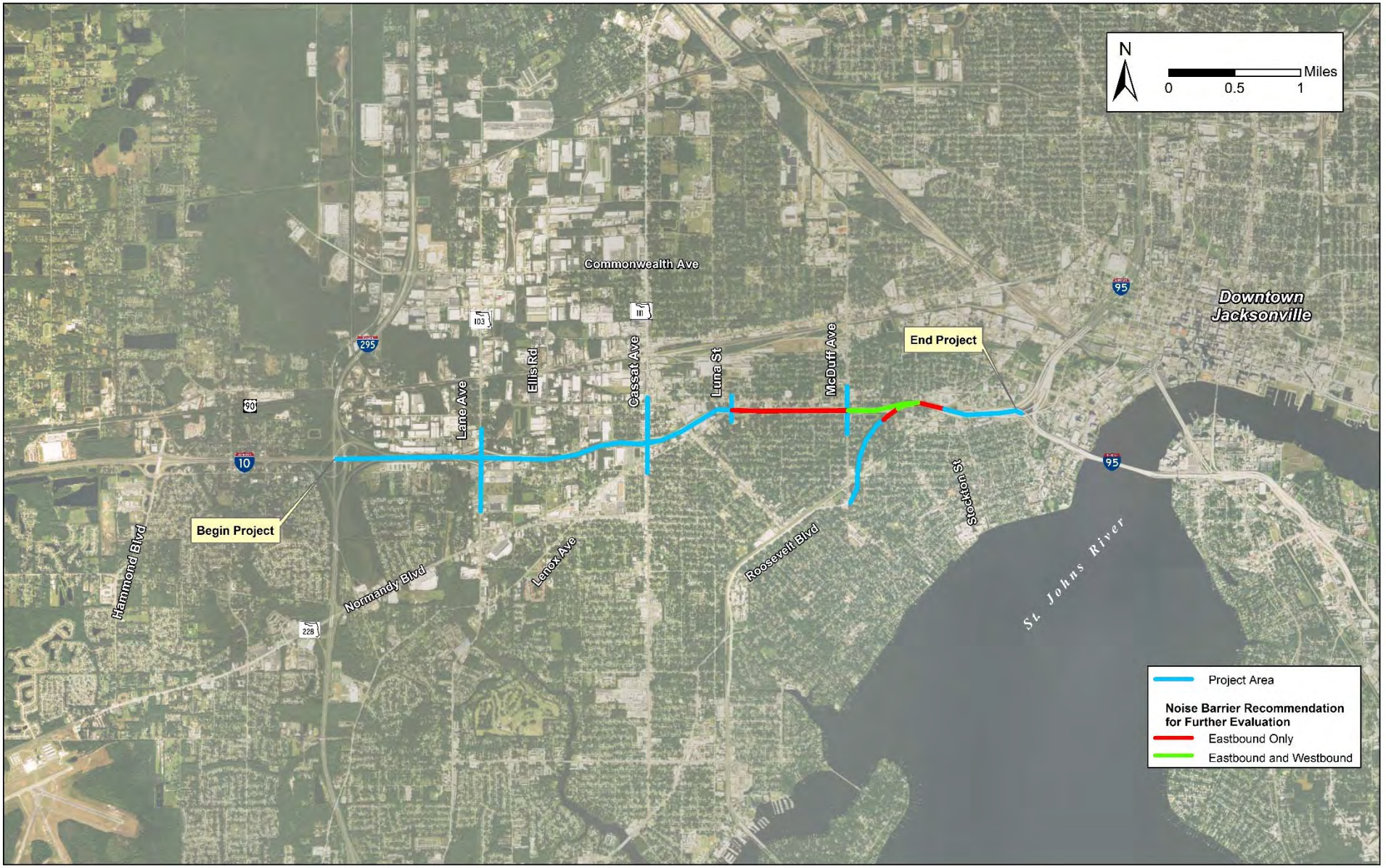


Figure 5-7. Noise Barrier Locations Recommended for Further Evaluation

5.2.4.3 Contamination

A Level I Contamination Screening Evaluation Report (CSER) was completed for this PD&E Study in accordance with the FDOT PD&E Manual Part 2, Chapter 20, Contamination (June 14, 2017). This report evaluated potential and existing contamination sources within the project area buffer. The CSER is on file at the FDOT District Two PLEMO.

Available records reported many sources associated with hazardous waste management, petroleum storage systems/spills, cleaning or dry-cleaning activities, and environmental contamination within a one-quarter mile radius of the project area. Evaluation of site characteristics for these sources and associated environmental information resulted in the identification of 74 sources. In addition, 10 pond sites were also investigated. A contamination risk rating was utilized to evaluate the likelihood a contaminated site may have an impact on the project area and potential pond sites. The risk rating distribution for these identified sites/facilities is presented in **Table 5-21**. A summary of potential pond site contamination risk rating is presented in **Table 5-22**.

Table 5-21. Summary of Potential Contamination Sources by Risk Rating

Risk Rating	Number of Sites		
	I-10	Pond Sites	TOTAL
High	32	5	37
Medium	25	2	27
Low	8	0	8
No	8	2	10

No Rating: Site not evaluated
No: No potential contamination impact to subject site/corridor
Low: Subject site/corridor have ongoing contamination issues, however, not likely to impact the project
Medium: Potential to impact the subject site/corridor from petroleum or hazardous substance contamination
High: Contamination will substantially impact construction activities, have ROW acquisition implications, or other liability to FDOT

Table 5-22. Summary of Pond Site Potential Contamination by Risk Rating

Pond Site ID	Pond Size (Acres)	Description	Risk Rating	Potential Contamination Source
CR-1	5.86	Existing stormwater pond	Medium	Existing stormwater pond.
CR-2	0.52	Existing stormwater pond	Not Evaluated	Existing stormwater pond.
CR-3	14.2	Grass area	No	Located with the I-10 ROW. Impacts to pond site construction not anticipated.
MC-1	3.4	Existing stormwater pond and partial wooded area	No	None. Impacts to pond site construction not anticipated.
MC-2	1.78	Grass area and partial wooded area	High	Located adjacent to I-95. Parcels are located within the Forest Street Incinerator Ash zone.
MC-3	1.79	Partial wooded area including N. Stuart Street	Medium	Located adjacent to I-95. Previous dry cleaner and photo finishing/printing operations.
MC-4	1.52	Existing parking lot	High	Located adjacent to I-95. Previous auto repair facility. Adjacent UST/LUST site to north with tank closures in 1990. Elevated screening levels in soil as of 1991. No cleanup activities to date

Pond Site ID	Pond Size (Acres)	Description	Risk Rating	Potential Contamination Source
MC-5	2.84	Existing stormwater pond, parking lot grass area, including portions of Houston and Cleveland Streets	High	Located adjacent to I-95. Previous auto repair/junk yard. UST/LUST tank closure activities performed. Elevated screening levels in soil as of 1991. No cleanup activities to date.
MC-6	0.76	Existing parking lot	High	Located adjacent to I-95. Previous residential, commercial and church site. Adjacent parcels previously removed USTs. Abandoned monitoring wells on the northern portion of the site.
MC-7	0.78	Existing stormwater pond	High	Located within I-95 ROW. Previous auto repair/junk yard facility. Site has been disturbed.

Based on these risk ratings, soil or groundwater contamination which can potentially impact worker health, the environment, construction schedule, and costs may be encountered during construction if potentially impacted sites are not addressed in the design phase.

A hazardous materials survey of potential Asbestos Containing Materials (ACMs) and lead based paint (LBP) coatings was completed for 15 bridges, 3 culverts, 1 box culvert, and 1 pedestrian underpass within the project study area. The findings of the ACM survey are summarized in **Table 5-23**. Analytical results of samples revealed that none of the homogeneous areas sampled on the referenced bridges contained greater than 1 percent asbestos by PLM. One paint chip sample was collected from the concrete painted Pedestrian Underpass walls located at I-10 and Day Avenue. Analytical results indicated that the paint chip sample contained 0.014 percent by weight of lead which is below the HUD action level for LBP.

Table 5-23. Summary of Analytical Results for Asbestos-Containing Materials and Lead-Based Paint

Friable ACM	Non-Friable Category I ACM	Non-Friable Category II ACM	Material Containing <1% Asbestos	Lead Based Pain ≥0.5 percent by weight
No	No	No	No	No*

* Lead concentrations were detected <0.5% wt. which must be handled in accordance with OSHA Standard 29 CFR 1926.62

A detailed discussion of the ACM survey is included in the Asbestos-Containing Materials and Lead-Based Pain Survey report completed for this PD&E Study. This report is on file at the FDOT District Two PLEMO.

It is recommended that a hazardous material survey be completed if construction activities will disturb existing infrastructure, equipment, or utilities that are not identified in the Asbestos-Containing Materials and Lead-Based Pain Survey report prepared for this PD&E.

5.2.5 Public Involvement/Project Coordination

Public involvement for the project include public meetings, project website, coordination meetings, and presentations to the North Florida TPO Board, Technical and Citizen Advisory Committees, Riverside Avondale Preservation Society, and North-East Florida Transportation Application Forum.

A project website, http://www.nflroads.com/SR8, has been set up to provide project information, meeting times and dates, and project related designs and documents.

5.2.5.1 Public Involvement Plan

A project specific Public Involvement Plan (PIP) was developed at the beginning of the PD&E process for the project. The purpose of the PIP is to assist in providing information and to obtain input from concerned citizens, agencies, private groups (residential/business), and governmental entities. The overall goal of this plan is to help ensure that the study reflects the values and needs of the communities it is designed to benefit.

Two public meetings were held for this project to provide interested citizens and residents an opportunity to learn about the project, ask questions, and provide feedback and/or comments to FDOT.

5.2.5.2 Public Workshop

An Alternative Public Workshop was held on Thursday, March 30, 2017 from 4:30 p.m. to 7:30 p.m. The workshop was intended to provide the public with an update on the PD&E Study. It was conducted at the FDOT Urban Office located at 2198 Edison Avenue, Jacksonville, Florida 32204.

Approximately 35 individuals attended the meeting representing local agencies, elected officials, the public, and media. Thirteen FDOT staff and FDOT consultants project team members were available at the meeting to discuss the project and answer questions. Two written comments received at the public meeting.

One commenter expressed concern regarding the length of the I-10 (SR 8) westbound on-ramp at Cassat Avenue stating that the length of the ramp is insufficient. Microsimulation analyses were performed for No Build and Build Alternatives for Opening Year (2025) and Design Year (2045) traffic characteristics. The Build Alternative simulation did not show excessive density at the merge location of the I-10 mainline with the Cassat Avenue on-ramp causing spillback onto Cassat Avenue preventing drivers from entering the ramp. Furthermore, intersection capacity analysis at this ramp showed LOS B during the Opening Year (2025) AM and PM peak hours and LOS B and LOS D during the Design Year (2045) AM and PM peak hours, respectively, staying within the FDOT target for urbanized intersections. Thus, the need for a longer merge segment or ramp is not warranted at this location.

A second commenter expressed concern regarding the proximity of I-10 (SR 8) to the residences along Hancock Road and associated noise and light impacts. Mention of a vegetative buffer that was removed has added to the increased noise and light impacts. Due to the isolated nature of the receptors at this location, a noise wall is not considered reasonable or feasible and does not meet FHWA and FDOT criteria for construction of a noise wall. Further evaluation for noise mitigation may be considered during the Design Phase of this project.

5.2.5.3 Public Hearing

A Public Hearing was scheduled for this project on Thursday, November 9, 2017 from 4:30 p.m. to 7:00 p.m. The FDOT will continue to coordinate with all project stakeholders following completion of the PD&E Study and through the design process. A copy of the public hearing transcript will be included as **Appendix G**.

6. List of Technical Reports

The following technical documents were completed for this PD&E study and are appended to this document:

6.1.1 Engineering

- Design Traffic Memorandum
- Interchange Operational Analysis Reports (IOARs)
    - Lane Avenue (SR 103) Interchange Interchanges
    - Cassat Avenue (SR 111) Interchange Improvements
- VISSIM Project Traffic Analysis Report (PTAR)
- Long Range Estimates
- Typical Sections

6.1.2 Environmental

- Phase I Cultural Resources Assessment Survey (CRAS)
- Level I Contamination Screening Evaluation Report (CSER)
- Natural Resource Evaluation (NRE) Report
    - Endangered Species Biological Assessment
    - Wetlands Evaluation Report
- Noise Study Report
- Air Quality Technical Memorandum
- Water Quality Impact Evaluation (WQIE) Checklist
- Type 2 Categorical Exclusion