



I-95/SR 9 Interchange at 45th Street

Project Development and Environment (PD&E) Study

(Mile Post 31.040)

Palm Beach County, Florida

FPID No.: 436519-1-22-01 | FAP No.: 0951-682-1 | ETDM No.: 14225



AIR QUALITY TECHNICAL MEMORANDUM

August 2017

Prepared for:
Florida Department of Transportation
District Four

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

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Prepared by:

CTS Engineering, Inc.

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CO Florida 2012 Output

1 INTRODUCTION

The purpose of this report is to present the findings of an air quality screening analysis conducted for a proposed Florida Department of Transportation (FDOT) project to improve the State Road (SR) 9/Interstate-95 (I-95) interchange at 45th Street in Palm Beach County ([Figure 1](#)). This Air Quality Technical Memorandum (AQTM) was prepared in accordance with the FDOT Project Development and Environment (PD&E) Manual, Chapter 19 – *Air Quality Analysis* (dated June 14, 2017).

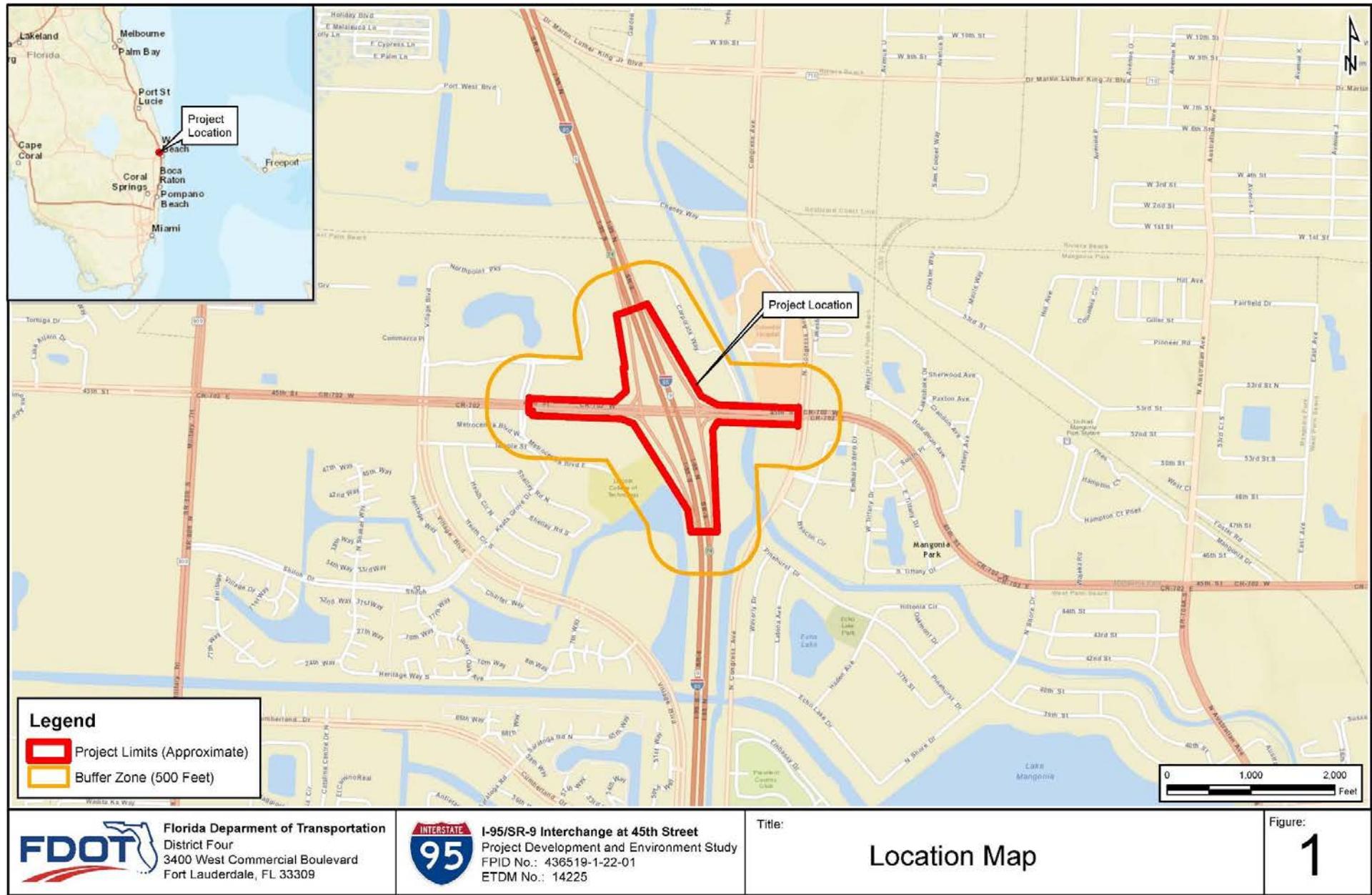
2 SUMMARY OF PROJECT

2.1 Project Description

This report contains information regarding the SR 9/I-95 from South of 45th Street to North of 45th Street PD&E Study (Mile Post 31.040). This project has been developed in compliance with Title VI of the Civil Rights Act of 1964 and other related federal and state nondiscrimination authorities. Neither the FDOT nor this project will deny the benefits of, exclude from participation in, or subject to discrimination anyone on the basis of race, color, national origin, age, sex, disability, or family status.

The FDOT, District Four is conducting a PD&E Study to identify short-term and long-term needs of I-95 and develop design concepts to address traffic spillback onto I-95, improve interchange operations, reduce congestion, and increase safety at the study interchange. This study will also consider Strategic Intermodal System (SIS) connector improvements needed within the project area and is consistent with plans for the I-95 mainline, including the potential extension of I-95 Express lanes through Palm Beach County. This proposed study will investigate alternatives to improve the overall operating conditions and enhance safety within the interchange.

Figure 1 - Location Map



The improvements to the I-95 Interchange at 45th Street will provide additional capacity for vehicles travelling east-west as well as operational improvements north-south through the interchange. Local and network connectivity for the City of West Palm Beach, the Town of Mangonia Park and Palm Beach County will be improved.

The 45th Street interchange of I-95 is a diamond interchange located in City of West Palm Beach, and in close proximity to the Town of Mangonia Park, and the City of Riviera Beach in North Palm Beach County, Florida ([Figure 1](#)). The intersections in the area of influence of the interchange are Village Boulevard and Northpoint Boulevard on the west and Corporate Way and North Congress Avenue on the east. The adjacent interchanges are Blue Heron Boulevard



Figure 2 - I-95 at 45th Street

interchange to the north (1.75 miles) and the Palm Beach Lakes Boulevard interchange to the south (2.80 miles). I-95 is a ten-lane divided interstate freeway providing four general purpose lanes and one high occupancy vehicle (HOV) lane in each direction. Auxiliary lanes are provided on both the northbound and southbound directions between 45th Street and Blue Heron Boulevard to the north. Within the study segment, I-95 passes over 45th Street on a bridge that accommodates ten lanes ([Figure 2](#)). I-95 is a designated SIS highway corridor. Both I-95 and 45th Street are designated as evacuation routes. 45th Street is a six-lane divided roadway with a raised landscape median within the vicinity of the I-95 interchange. Sidewalks are provided along both sides of 45th Street throughout the study area. Additionally, a bicycle lane is provided in both directions along 45th Street starting at the Harley Davidson entrance (west of I-95) to Corporate Way (east of I-95). There are two dedicated left-turn lanes in each direction to access the I-95 on-ramps and three through lanes in each direction. A single free-flow right-turn lane is provided on both eastbound and westbound along 45th Street to serve the I-95 on-ramps.

The land use adjacent to the interchange is mainly residential, commercial, institutional and industrial. Commercial and industrial uses are predominant on the west side of I-95, while commercial and healthcare properties are along the east side of I-95. The South Florida Rail Corridor (SFRC)/CSX Railroad passes under I-95 in this area approximately one mile northwest of the 45th Street interchange. The adjacent signalized intersections are: Village Boulevard and Northpoint Boulevard/Metrocentre Boulevard west of the I-95 southbound ramps, and Corporate Way and N. Congress Avenue east of the I-95 northbound ramps.

Improvement to the I-95 interchange at 45th Street is consistent with the Cost Feasible Plan of the Palm Beach County Metropolitan Planning Organization (MPO)'s 2045 Long Range Transportation Plan (LRTP). *"The purpose is to improve interchange operations and reduce congestion, reduce potential for traffic spillback onto I-95, and increase safety. The improvements are needed to ensure that the I-95 interchange will meet FDOT Level-of-Service standards through year 2040."*

2.2 Background

The FDOT made improvements to the I-95 mainline in Palm Beach County in the 1990s and 2000s, adding a High Occupancy Vehicle (HOV) lane and auxiliary lanes from south of Linton Boulevard to north of PGA Boulevard. Minor interchange improvements were also made to eight of the existing 18 interchanges along this section of the corridor. At the time of the project, FDOT committed to re-examine the need for both short-term and long-term improvements at those interchanges that were not improved during the I-95 mainline project. FDOT District Four also identified the need to re-examine the 2003 I-95 Master Plan Study for Palm Beach County to develop new improvements to interchanges based on changes in traffic volumes and updated design standards since the Master Plan was developed.

A Concept Development Report (CDR) was prepared by the FDOT District Four Office of Planning and Environmental Management in August of 2014. The following are the recommendations identified for short-term and long-term improvements:

2.2.1 CDR Short Term Improvements:

- Third southbound left-turn lane at the I-95 southbound ramp;
- Third northbound left-turn lane and third right-turn lane at the I-95 northbound ramp;
- Additional westbound through lane from Congress Avenue to the I-95 northbound ramps.

2.2.2 CDR Long Term Improvements:

- Fourth through lane on eastbound 45th Street between Village Boulevard and Northpoint Boulevard;
- Fourth through lane on westbound 45th Street east of Congress Avenue;
- Fourth southbound left-turn lane at the I-95 southbound ramp;
- Fourth northbound left-turn lane at the I-95 northbound ramp.

Based on the benefits identified by the proposed improvements listed in the Concept Development Report, it was recommended that FDOT implement this package of proposed improvements to address operational and safety issues/deficiencies through 2040. Due to the proposed impacts and costs associated with the proposed improvements, a PD&E Study was recommended prior to design and project implementation.

2.3 Purpose and Need

The purpose of the study is to identify the short-term and long-term needs of I-95 and develop design concepts to address traffic spillback onto I-95, improve interchange operations, reduce congestion, and increase safety at the study interchange. This study will also consider SIS connector improvements needed within the project area and is consistent with plans for the I-95 mainline, including the potential extension of I-95 Express lanes through Palm Beach County.

Additional considerations for the purpose and need for this project include Capacity, Transportation Demand, Safety, Planning Consistency, Social Demands/Economic Development, Modal Interrelationships, and System Linkage.

Capacity

Traffic operational analyses were conducted at six study intersections on 45th Street to determine the existing delay and Level of Service (LOS).

During the AM and PM peak hours, the existing conditions (2016) are as follows for the following intersections on 45th Street [Name of intersection, overall LOS (AM/PM)]:

- Village Boulevard: (C/C)
- Northpoint Boulevard: (C/C)
- I-95 southbound ramps: (C/C)
- I-95 northbound ramps: (C/C)
- Corporate Way: (C/C)
- Congress Avenue: (C/D)

Operational analyses were conducted to evaluate for year 2040 No Build conditions (without roadway improvements) at the six intersections for AM and PM peak hours. The 2040 No Build conditions are predicted as follows: [Name of intersection, overall LOS (AM/PM)]:

- Village Boulevard: (D/D)
- Northpoint Boulevard: (D/D)
- I-95 southbound ramps: (F/C)
- I-95 northbound ramps: (F/D)
- Corporate Way: (C/B)
- Congress Avenue: (D/E)

Under the existing conditions scenarios, most of the intersections operate at LOS C. Under the project 2040 No Build conditions, most intersections operate at LOS D or

worse. If no improvements are made by 2040, all intersections will experience excessive delays and queuing and operate below acceptable LOS standards (LOS D) during both the AM and PM peak periods.

Transportation Demand

According to the US Census, the county experienced a population growth from 1,320,134 in 2010 to 1,372,171 in 2013, representing an increase of 3.94%. Evaluating the population growth for the City of West Palm Beach, the City has grown from a population of 99,919 in 2010 to 102,436 in 2013 representing an increase of 2.52%. The population of Palm Beach County is projected to increase from 1,372,171 in 2013 to 1,715,300 in 2040 (US Census), representing an increase of 25%. The commercial areas along 45th Street and the new businesses taking advantage of areas designated as special impact zones will further increase the transportation demand along the proposed project area that will contribute to congested conditions. As the population of the county and city increases, developments in the county will continue to grow thereby increasing the amount of traffic. Improvements to the existing interchange is expected to provide mobility to the residents and commuters in this area.

Traffic Safety

The crash analysis results reveal that there was a total of 869 crashes on I-95 from Palm Beach Lakes Boulevard to Blue Heron Boulevard during the four study years (2011-2014). Of these 869 crashes, rear end crashes were the most common type of crash accounting for 37.5% of total crashes followed by sideswipe crashes accounting for 16.3% of total crashes. The 869 crashes included 1,671 vehicles. There were 627 injuries, 58 severe injuries and 10 fatalities. The average crash rate for the I-95 mainline segment within the study limits is 0.06 and is lower than the statewide average crash rate of 0.75 for similar interstate facilities. Summaries of the crash analysis are provided in [Table 1](#).

Table 1: I-95 Crash Summary (2011 to 2014)

Crash Type	Number of Crashes				4-Year Total Crashes	Percent of Total	Mean Crashes Per Year			
	Year									
	2011	2012	2013	2014						
Front to Rear (Rear End)	71	67	75	113	326	37.5%	81.5			
Front to Front	2	0	1	4	7	0.8%	1.75			
Angle	17	28	21	28	94	10.8%	23.5			
Sideswipe, same direction	31	31	26	54	142	16.3%	35.5			
Sideswipe, opposite direction	2	0	3	0	5	0.6%	1.25			
Rear to Side	0	0	0	0	0	0.0%	0			
Rear to Rear	0	0	1	0	1	0.1%	0.25			
Other	54	60	73	79	266	30.6%	66.5			
Unknown	5	5	4	14	28	3.2%	7			
Total Crashes	182	191	204	292	869	100.0%	217.25			

The crash analysis results reveal that there was a total of 174 crashes on 45th Street from Village Boulevard to Congress Avenue during the four study years (2011-2014). Of these 174 crashes, rear end crashes were the most common type of crash accounting for 48.3% of total crashes followed by angled crashes accounting for 25.9% of total crashes. The 174 crashes included 378 vehicles, 4 pedestrians and 2 cyclists. There were 164 injuries, 14 severe injuries and 1 fatality. The average crash rate for 45th Street within the study limits is 2.72 and is lower than the statewide average crash rate of 3.20 for similar arterial facilities. Summaries of the crash analysis are provided in **Table 2**.

Table 2: 45th Street Crash Summary (2011 to 2014)

Crash Type	Number of Crashes				4-Year Total Crashes	Percent of Total	Mean Crashes Per Year			
	Year									
	2011	2012	2013	2014						
Front to Rear (Rear End)	12	13	29	30	84	48.3%	21			
Front to Front	1	4	0	3	8	4.6%	2			
Angle	8	12	10	15	45	25.9%	11.25			
Sideswipe, same direction	0	3	0	6	9	5.2%	2.25			
Sideswipe, opposite direction	0	0	1	0	1	0.6%	0.25			
Rear to Side	0	0	0	1	1	0.6%	0.25			
Rear to Rear	0	0	0	0	0	0.0%	0			
Other	2	0	5	4	11	6.3%	2.75			
Unknown	12	0	0	3	15	8.6%	3.75			
Total Crashes	35	32	45	62	174	100.0%	43.5			

Plan Consistency

The Palm Beach County MPO 2040 Long Range Transportation Plan (LRTP) identified the I-95 at 45th Street Interchange as a Local Stakeholder Project Request. The Master Comprehensive Bicycle Transportation Plan (MCBTP) - Bicycle Facility Recommendation Map designates 45th Street, both east and west of the I-95 interchange, as a "Re-Stripe Candidate" and the Bicycle Needs Map designates 45th Street, both east and west of I-95 interchange, as "Enhanced Priority, Needs Improvement" (Bike LOS C). These designations will be taken into consideration during the PD&E phase such that the designated bicycle lanes can be provided whenever possible.

The FDOT Five-Year Work Program identifies a traffic operations project to install a new dynamic message sign (DMS) on 45th Street east and west of the I-95 interchange.

Social Demand and Economic Development

The Future Land Use Plan for the City of West Palm Beach (June, 2013) identifies the areas north of the interchange to be Industrial uses in a Special Impact Zone to the west of the interchange and Industrial, Conservation and Community Service to the east. Areas to the south of the interchange are identified to be Commercial in a Special Impact Zone and single family to the west of the interchange, and Conservation, Commercial in Special Impact Zone, and Single Family to the west. Special Impact Zones (SIZ) are areas where the City denotes heighten site plan review and compatibility analysis to reduce potential land use incompatibilities. The proposed improvements on the I-95/45th Street interchange will improve mobility and support the economic development of the local businesses as well as stimulate major construction activities that will contribute to the economic growth within the area.

The Florida Division of Emergency Management designates specific routes that residents and visitors can use in case of emergency situations to vacate specific areas. Based on Palm Beach County's Evacuation Routes and Zones Map, 45th Street is classified as an evacuation route from SR 809 to SR A1A, which includes the section of 45th Street in the vicinity of I-95. Serving as part of the evacuation route network, I-95 and 45th Street play an important role in facilitating traffic movement during emergency evacuation periods.

As the population of the County continues to increase, the proposed improvements on the I-95 and 45th Street interchange will enhance capacity and mobility for residents during evacuation.

Currently, along 45th Street are commercial properties consisting of retail and professional offices with a few industrial and non-residential properties. To the north are retail/offices such as North Village Square, Lockheed Martin, Boys & Girls Club, and various corporate plazas that house different commercial establishments. To the south are also mainly hotel and commercial and food establishments, and an educational facility, Lincoln College of Technology. There is a residential area in the southwest portion of the interchange.

Modal Interrelationships

Currently, there are sidewalks and crosswalks along both sides of 45th Street within the vicinity of the interchange; however, not all sidewalks and crosswalks meet the Americans with Disabilities Act (ADA) requirements. Bicycle lanes are currently provided along 45th Street from Corporate Way and continuing west through Village Boulevard, except for a missing section just east of Northpoint Boulevard. As part of the proposed improvements for the interchange, sidewalks and crosswalks within the limits of construction shall be upgraded to meet ADA standards. Bicycle lanes are recommended in conjunction with the recommended lane widening both east of Corporate Way as well as the missing section east of Northpoint Boulevard.

The Mangonia Park Tri-Rail Station is located on 45th Street, approximately 1.3 miles east of the I-95 interchange. The station provides 272 parking spaces and also provides a park-and-ride designated area. The Mangonia Park Tri-Rail Station is accessed by Palm Beach County Transit, Palm Tran, Routes 2, 31, and 33. 45th Street in the vicinity of the I-95 interchange is served by Palm Tran Route 31. Congress Avenue and 45th Street are also served by transit routes. 45th Street is designated as a SIS Connector from I-95 to the Tri-Rail Station. The proposed improvements on the I-95 and 45th Street interchange will improve access to the Tri-Rail Station thus encouraging ridership.

System Linkage

The proposed project at I-95 and 45th Street will help improve connectivity and capacity within the roadway network by addressing traffic spillback onto I-95 and improving interchange connections. The proposed project enhances mobility to the residential and commercial areas along 45th Street, which provides east-west access in North West Palm Beach and Palm Beach County.

The primary need of the project is to alleviate existing and future traffic congestion thereby improving safety at the interchange. Recent studies completed in the region such as the I-95 Interchange at 45th Street Interchange Concept Development Report completed in 2014 identified operational deficiencies at ramps, the terminal intersections, and the adjacent intersections. Existing observations also show increased truck traffic from I-95 to Congress Avenue heading to the Port of Palm Beach contributing to the congestions in the study area. If no operational and safety improvements are made within the interchange area, conditions will become progressively worse as traffic volumes continue to increase, thereby increasing the number of crashes and deteriorating access of this interchange.

3 Alternatives Analysis

All concepts were evaluated and analyzed in order to select a recommended alternative. The concepts developed were further refined with the objective of elimination and reduction of impacts. The following describes the alternatives considered for this project.

3.1 No Build Alternative

The No Build Alternative proposes to keep the existing interchange roadway network into the future without improvements. This alternative is considered to be a viable alternative during the public hearing and final selection phase to serve as a comparison to the study alternatives.

The 45th Street typical section within the project limits consists of a six-lane urban divided roadway with a raised landscaped median. There are two dedicated left-turn lanes to



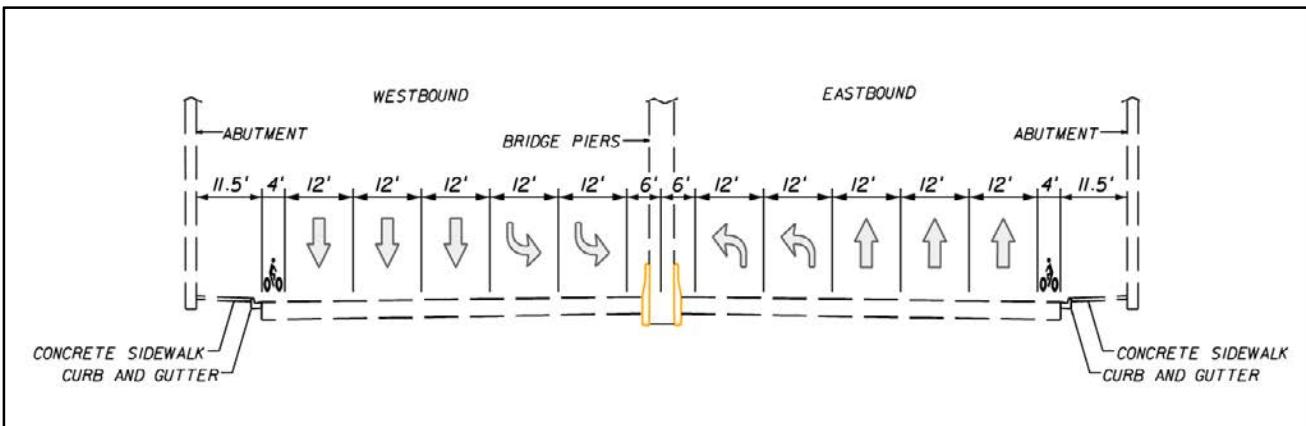
access the I-95 on-ramps and three through lanes in each direction underneath the I-95 overpass. The EB and WB lanes are separated by median containing a raised concrete barrier wall as well as support piers for the I-95 overpass. ([Figure 3](#))

The No Build Alternative has a number of positive aspects, since it would not require expenditure of public funds for design, right-of-way acquisition, construction, or utility relocation. Traffic would not be disrupted due to construction, therefore, avoiding inconveniences to local residents and businesses. Also, there would be no direct or secondary impacts to the environment, the socio-economic characteristics, or community cohesion of the area.

However, the No Build Alternative fails to fulfill the purpose and need of the project. Operational and safety conditions within the interchange area will become progressively worse as traffic volumes continue to increase, thereby increasing the number of crashes and deteriorating access of this interchange.

3.2 Transportation Systems Management and Operation (Figures 4 & 5)

The Transportation Systems Management and Operations (TSM&O) alternative is comprised of minor improvement options that are typically developed to alleviate specific traffic congestion/safety problems, or to get the maximum utilization out of the existing facility by improving operational efficiency. TSM&O alternatives may include intersection improvements such as increasing turning radii, adding turn-lanes, increasing turn-lane lengths, or intelligent transportation system (ITS) enhancements such as closed circuit television (CCTV), dynamic message signs (DMS) with real-time driver information or signalization upgrades and/or optimization.

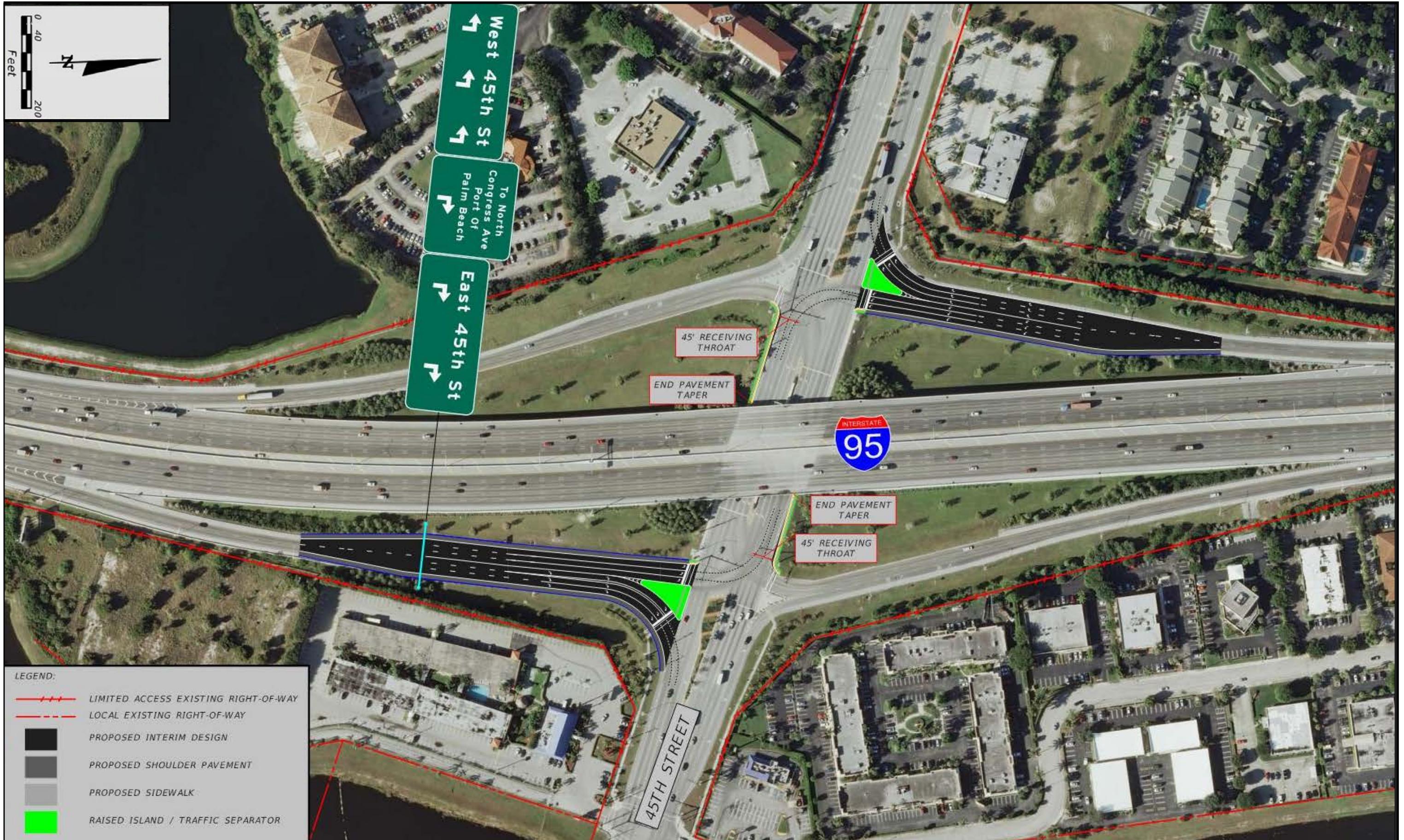


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TITLE:

Existing Typical Section

FIGURE:
3



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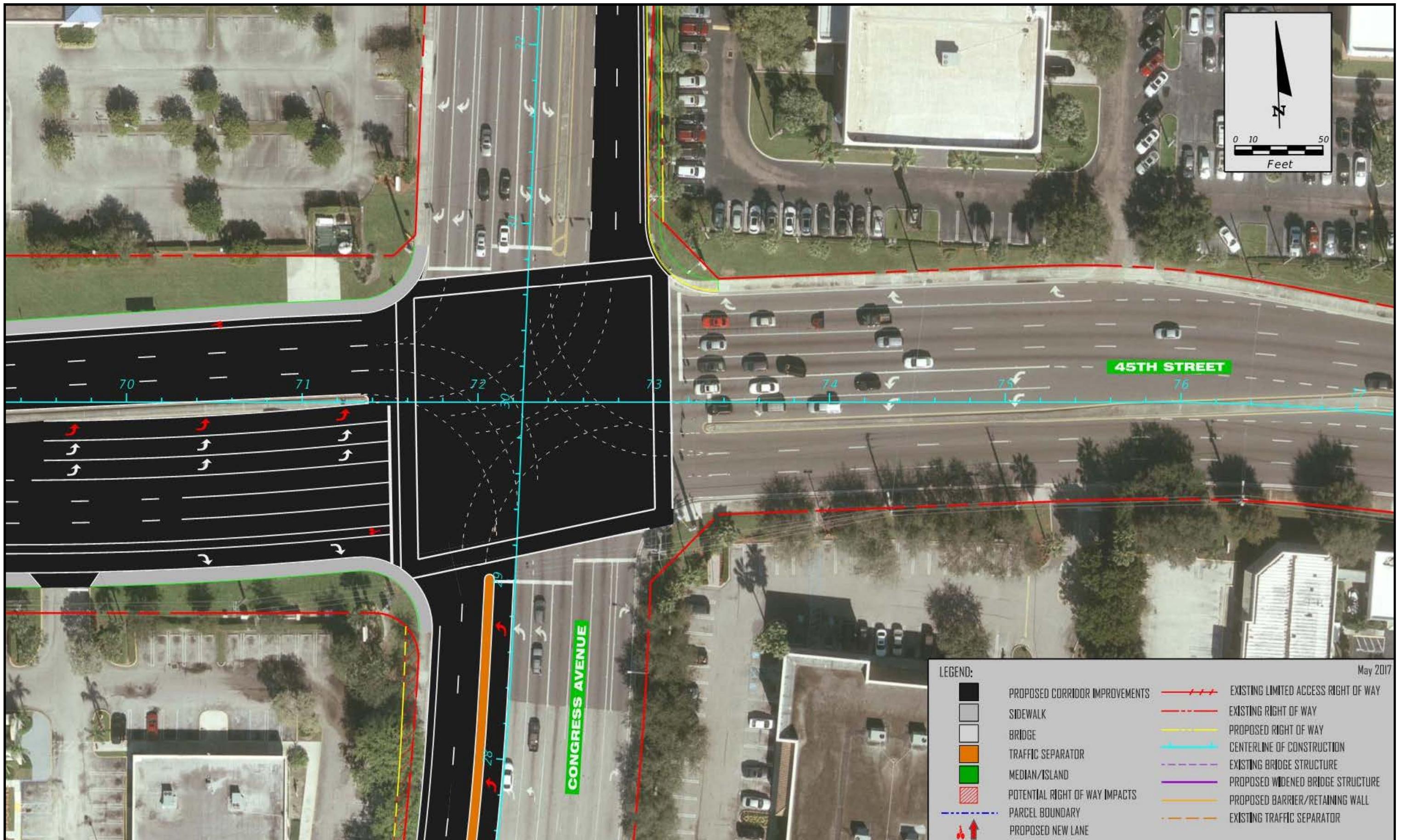
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TITLE:

TSM&O Improvements

FIGURE:

4



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The proposed TSM&O options are as follows:

- Provide one additional right turn lane and one additional left turn lane at the I-95 southbound off-ramp intersection;
- Provide new overhead signage at the I-95 southbound off-ramp to indicate 3 lanes to East 45th Street and 3 lanes to West 45th Street;
- Provide one additional right turn lane and one additional left turn lane at the I-95 northbound off-ramp intersection;
- Provide new overhead signage at the I-95 northbound off-ramp to indicate 3 lanes to West 45th Street, 1 lanes to North Congress Avenue, and 2 lanes to East 45th Street;
- Provide travel information system;
- Develop signal system strategies.

3.3 Build Alternatives

All conceptual build alternatives were evaluated in a general manner and analyzed in order to select the recommended Build Alternative. The concepts developed were further refined with the objective of elimination and reduction of impacts. The engineering decisions to achieve this objective are thoroughly documented in the Preliminary Engineering Report.

3.3.1 Alternative 1 (Figures 6 & 7)

- Widen 45th Street to add one through lane in each direction from Northpoint Boulevard to Congress Avenue;
- Provide one bike lane in each direction from Northpoint Boulevard to Congress Avenue;
- Extend the eastbound to southbound on-ramp to start just east of Northpoint Boulevard;
- Provide one additional right turn lane and one additional left turn lane at the I-95 southbound off-ramp intersection;



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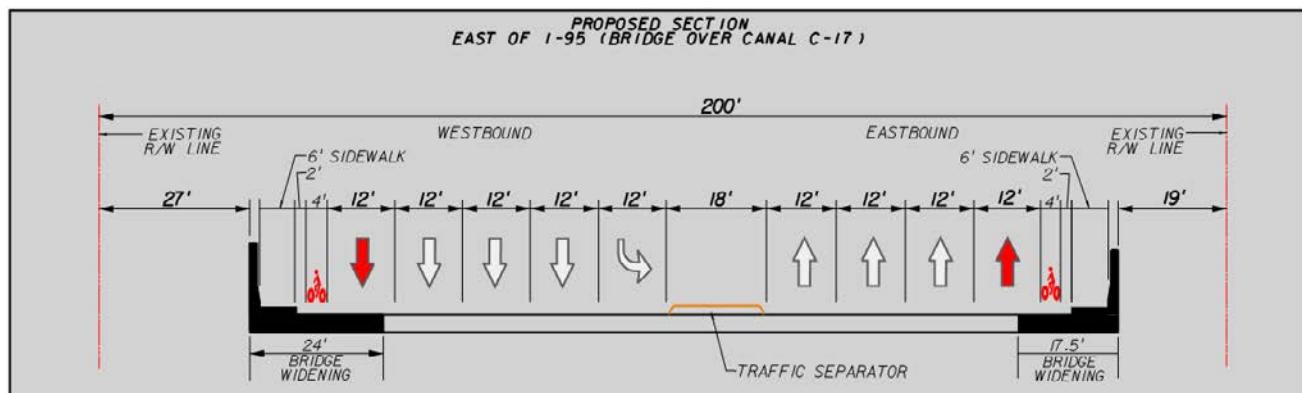
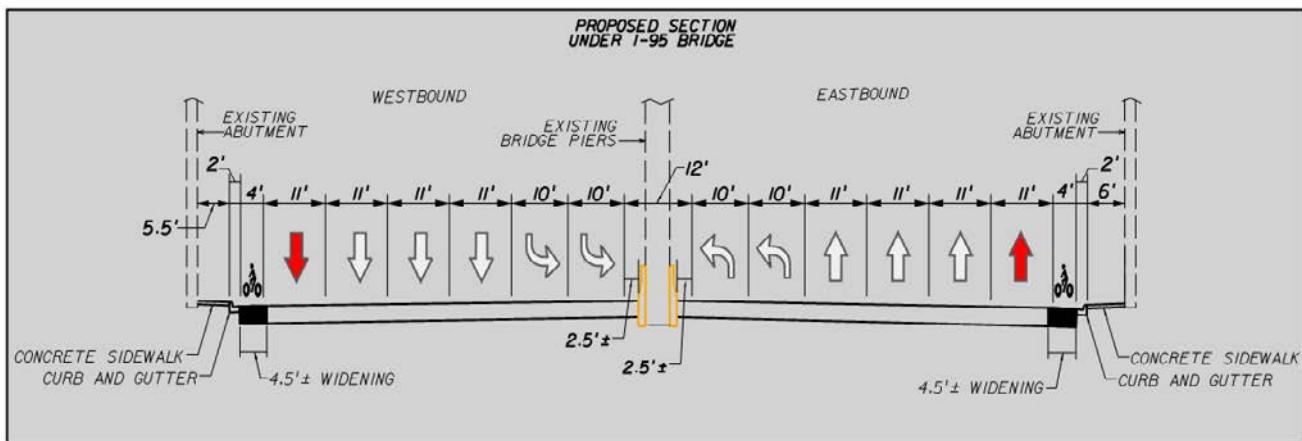
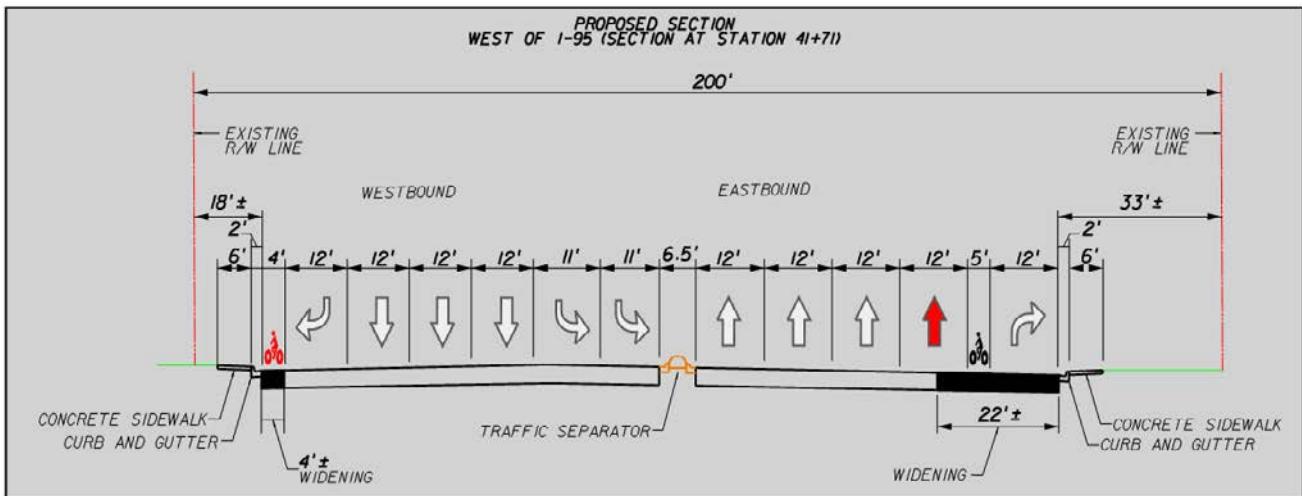
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TITLE:

Alternative 1 Improvements

FIGURE:

6



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TITLE:

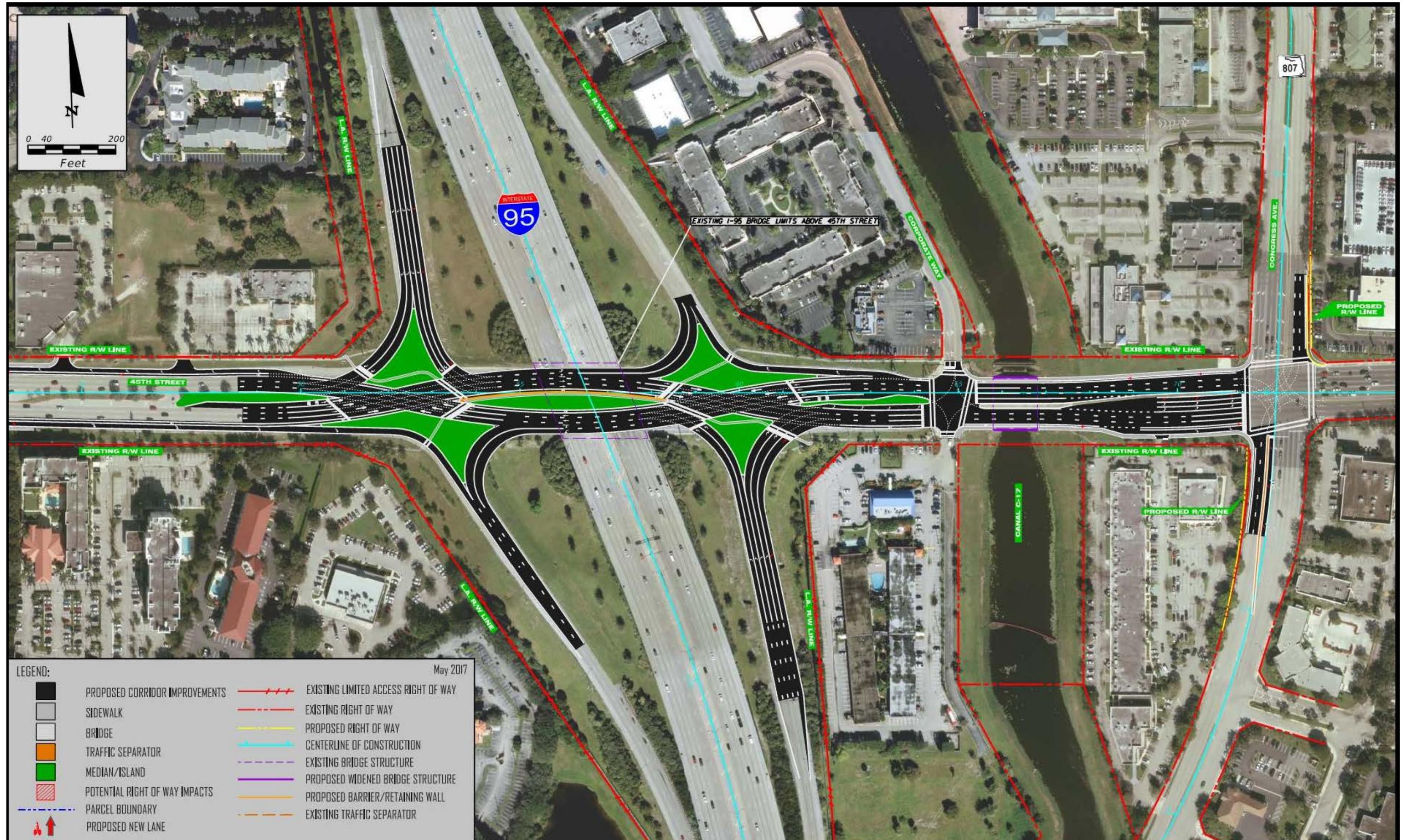
Typical Section – Alternative 1

FIGURE:
7

- Provide new overhead signage at the I-95 southbound off-ramp to indicate 3 lanes to East 45th Street and 3 lanes to West 45th Street;
- Provide one additional right turn lane and one additional left turn lane at the I-95 northbound off-ramp intersection;
- Provide new overhead signage at the I-95 northbound off-ramp to indicate 3 lanes to West 45th Street, 1 lanes to North Congress Avenue, and 2 lanes to East 45th Street;
- Widen the existing bridge along 45th Street over the C-17 Canal to accommodate one additional through lane and one bike lane in each direction;
- Add one additional left turn lane from eastbound 45th Street to northbound Congress Avenue to provide triple left turns at the intersection;
- Add one additional left turn lane from northbound Congress Avenue to westbound 45th Street to provide triple left turns at the intersection;
- Restriped the existing 45th Street westbound right turn lane to a shared through and right;
- Provide travel information system;
- Develop signal system strategies.

3.3.2 Alternative 2 (Figures 8 & 9)

- Modify the existing Diamond Interchange to a Diverging Diamond Interchange (DDI) configuration, which provides 3 continuous through lanes through the interchange with 2 free flow left turn lanes into the I-95 on ramps;
- Provide one bike lane in each direction from Northpoint Boulevard to Congress Avenue;
- Extend the 45th Street eastbound to I-95 southbound on-ramp to start at Northpoint Boulevard;
- Provide one additional left turn lane at the I-95 southbound off-ramp intersection;
- Provide new overhead signage at the I-95 southbound off-ramp to indicate 3 lanes to East 45th Street and 2 lanes to West 45th Street;
- Provide one additional right turn lane at the I-95 northbound off-ramp intersection;



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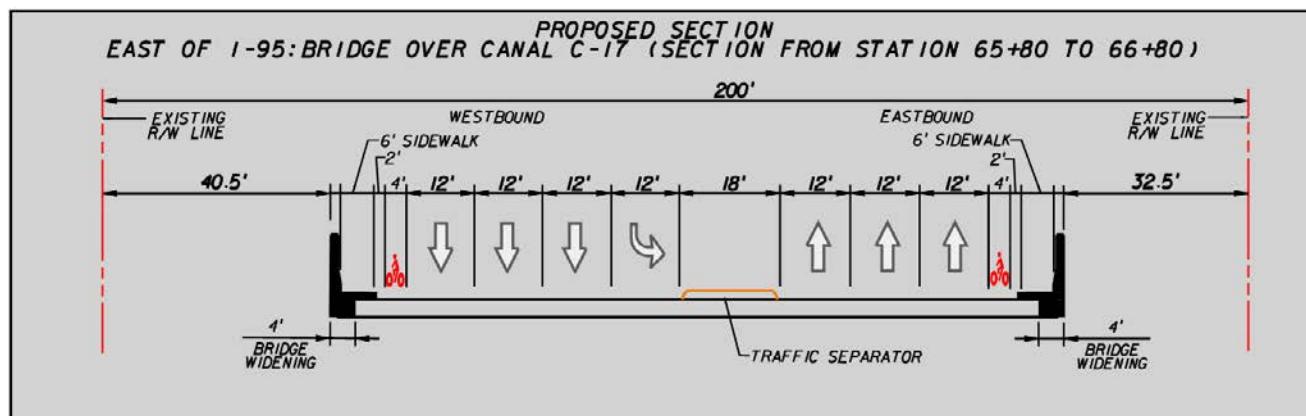
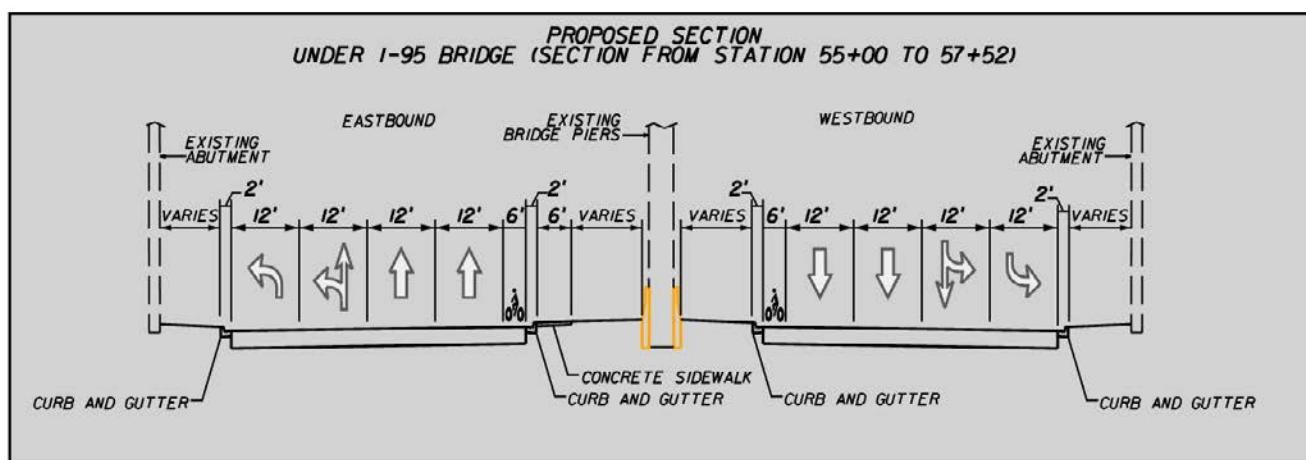
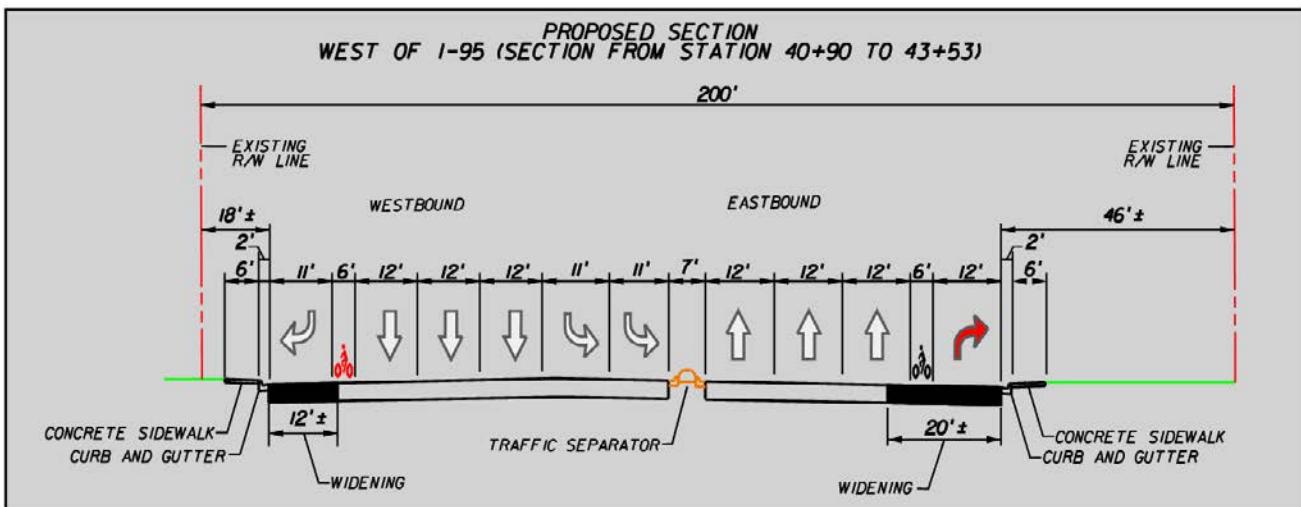


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TITLE:

Alternative 2 Improvements

FIGURE:



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TITLE:

Typical Section – Alternative 2

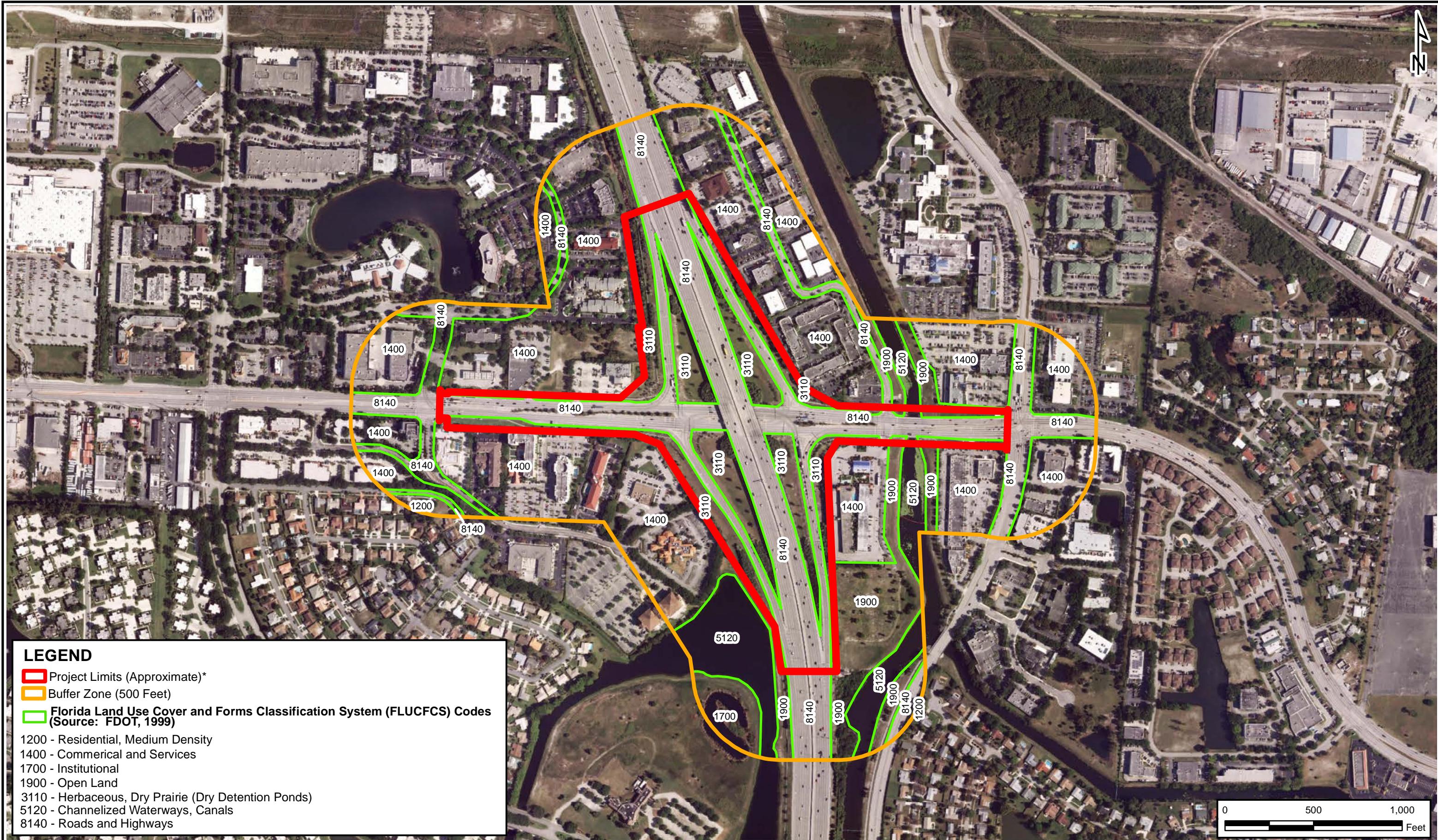
FIGURE:
9

- Provide new overhead signage at the I-95 northbound off-ramp to indicate 2 lanes to West 45th Street, 1 lanes to North Congress Avenue, and 2 lanes to East 45th Street;
- Widen the existing bridge along 45th Street over the C-17 Canal to accommodate one bike lane in each direction;
- Add one additional left turn lane from eastbound 45th Street to northbound Congress Avenue to provide triple left turns at the intersection;
- Add one additional left turn lane from northbound Congress Avenue to westbound 45th Street to provide triple left turns at the intersection;
- Provide travel information system;
- Develop coordinated signal system strategies.

4 EXISTING LAND USE

Existing land use within the project area was determined through the interpretation of aerial photography and field reconnaissance of the project corridor conducted on May 17, 2017. Existing land use was mapped based on the Florida Land Use, Cover and Forms Classification System (FLUCFCS) (FDOT, 1999) for the project area and is illustrated in [Figure 10](#).

I-95 and 45th Street are considered Roads and Highways (FLUCFCS 8140). The majority of the remaining existing land use surrounding the interchange is commercial development (FLUCFCS 1400). Additional land uses adjacent to the intersection in relatively low abundance include dry detention ponds (FLUCFCS 3110), open land (FLUCFCS 1900), medium-density residential development (FLUCFCS 1200), Channelized waterways (FLUCFCS 5120), institutional (FLUCFCS 1700), and other roadways (FLUCFCS 8140). No undeveloped natural areas are present within the project limits or 500-foot buffer zone limits (see [Figure 10](#)).



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



I-95/SR-9 Interchange at 45th Street
 Project Development and Environment Study
 FPID No.: 436519-1-22-01
 ETDM No.: 14225

Title:

Land Use Map

Figure:

10

5 AIR QUALITY ASSESSMENT

The proposed project has the potential to alter traffic conditions and influence the air quality within the project study area. Potential air quality impacts in the area surrounding the project corridor were assessed for all viable project alternatives, including the No-Build Alternative, in accordance with the Federal Highway Administration (FHWA) discussion paper *Appropriate Level of Highway Air Quality Analysis for a CE/EA/FONSI and EIS* and guidelines contained in Part 2, Chapter 19 of the FDOT PD&E Manual (dated June 14, 2017).

The pollutants of primary concern with roadway traffic are ozone (O₃), oxides of nitrogen (NO_x), hydrocarbons (HC), small particulate matter (PM10) and carbon monoxide (CO). Ozone, NO_x, HC and PM10 are analyzed at the program level unless specific review of an individual project is requested by appropriate reviewing agencies. Since CO is a localized pollutant that is emitted directly into the atmosphere by vehicles, it is analyzed for individual roadway projects where substantial changes to the traffic conditions are anticipated. The National Ambient Air Quality Standard (NAAQS) for CO is 35 parts per million (PPM) for one-hour periods and 9 PPM for eight-hour periods.

Much of the project corridor is bordered by commercial land use such as hotels, medical offices, restaurants and retail establishments. Areas at these sites that may be considered sensitive to changes in air quality include hotel pools and restaurant patios.

5.1 Project-Level Air Quality Analysis Methodology

The project's No Build and Build Alternatives were assessed for potential air quality impacts at the project-level using the FDOT's PC based CO Florida 2012 screening model. Traffic-generated air quality impacts are primarily a concern near signalized intersections during peak periods, when numerous vehicles are often stopped and idling during the traffic signal's red phase.

The *CO Florida 2012* screening model incorporates emission factors developed from the United States Environmental Protection Agency's (USEPA) Motor Vehicle Emission



Simulator (MOVES) version 2010a model and the CAL3QHC2 dispersion model and includes several worst-case assumptions for traffic characteristics, receptor location, meteorology and terrain. *CO Florida 2012* generates multiple default receptor locations, the numbers of which are dependent upon intersection type. User inputs to the screening model include project alternative; land use type; analysis year; and, the volume and speed of peak hour traffic approaching the intersection. Given the local surroundings, an urban land use type was selected, which includes a background CO level of 5.0 PPM for one-hour predictions and 3.0 PPM for eight-hour predictions.

Output from the *CO Florida 2012* screening model includes the estimated one-hour and eight-hour CO level, in PPM, at the default receptor locations and a report stating whether the project passes or fails the screening analysis. A project alternative that passes the *CO Florida 2012* model is not expected to result in any violations of the NAAQS for CO and is not likely to have any impact on the air quality of the surrounding area.

The location within the project study area considered to have the greatest potential for traffic generated air quality impacts is the I-95 interchange at 45th Street. This location was selected for the CO screening analysis.

The traffic data used for the CO screening analysis were derived from traffic projections for the project's build year (2020) and design year (2040). The worst-case design hour traffic data for the No Build Alternative is the same as for the recommended Build Alternative. In *CO Florida 2012*, the user inputs the traffic volumes for each approach leg. The program automatically selects the worst-case (volume and speed) for each direction and applies that volume to both legs. The posted speed limit in the area [65 miles per hour (MPH)] was used for the peak hour cruise speed on I-95; and, a speed of 45 MPH was used for 45th Street. Design hour traffic volume data for this interchange are presented in **Table 3**.

Table 3: CO Florida 2012 Traffic Data Summary

Alternative	Roadway	Direction	Design Hour Approach Volumes		Speed (Miles/Hour)
			Build Year (2020)	Design Year (2040)	
No Build	I-95	Southbound	9,159	9,481	65
		Northbound	10,102	11,579	65
	45 th Street	Eastbound	2,570	3,329	45
		Westbound	1,742	2,275	45
Build	I-95	Southbound	9,159	9,481	65
		Northbound	10,102	11,579	65
	45 th Street	Eastbound	2,570	3,329	45
		Westbound	1,742	2,275	45

5.2 Air Quality Analysis Results

The worst-case predicted CO levels for this analysis are presented in [Table 4](#). Individual results for the CO Florida 2012 default receptors are presented in the screening model output files presented in the [Appendix](#). The CO screening analysis for this project indicates that the worst-case one-hour CO level is 9.9 PPM during the build year and design year. The predicted worst-case eight-hour CO level is estimated to be 5.9 PPM during the build year and the design year.

Table 4: CO Florida 2012 Screening Analysis Results

Alternative	Projected Worst-Case One-Hour Carbon Monoxide Level (PPM)		Projected Worst-Case Eight-Hour Carbon Monoxide Level (PPM)	
	Opening Year (2020)	Design Year (2040)	Opening Year (2020)	Design Year (2040)
No Build	9.9	9.9	5.9	5.9
Build	9.9	9.9	5.9	5.9

5.3 Greenhouse Gas Emissions

Greenhouse gases (GHG) cause a global phenomenon in which heat is trapped in the earth's atmosphere. Because atmospheric concentration of GHGs continues to climb, our planet will continue to experience climate-related phenomena. For example, warmer global temperatures can cause changes in precipitation and sea levels. The burning of fossil fuels and other human activities are adding to the concentration of GHGs in the atmosphere. Many GHGs remain in the atmosphere for time periods ranging from decades to centuries.

To date, no national standards have been established regarding GHGs, nor has the USEPA established criteria or thresholds for ambient GHG emissions pursuant to its authority to establish motor vehicle emission standards for CO₂ under the Clean Air Act. GHGs are different from other air pollutants evaluated in the federal environmental reviews because their impacts are not localized or regional due to their rapid dispersion into the global atmosphere, which is characteristic of these gases. The affected environment for CO₂ and other GHG emissions is the entire planet. In addition, from a quantitative perspective, global climate change is the cumulative result of numerous and varied emissions sources (in terms of both absolute numbers and types), each of which makes a relatively small addition to global atmospheric GHG concentrations. In contrast to broad scale actions such as actions involving an entire industry sector or very large geographic areas, it is difficult to isolate and understand the GHG emissions impacts for a particular transportation project. Furthermore, presently there is no scientific methodology for attributing specific climatological changes to a particular transportation project's emissions.

Under the National Environmental Policy Act (NEPA), detailed environmental analysis should be focused on issues that are significant and meaningful to decision-making (40 CFR 1500.1(b), 1500.2(b), 1500.4(g), and 1501.7). The 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 preferred alternative. More detailed information on GHG emissions “is not essential to a reasoned choice among reasonable alternatives” (40 CFR 1502.22(a)) or to making a decision in the best overall public interest based on a balanced consideration of transportation, economic, social, and environmental needs and impacts (23 CFR 771.105(b)).

In summary, this document does not incorporate an analysis of the GHG emissions or climate change effects of each of the alternatives because the potential change in GHG emissions is very small in the context of the affected environment. Because of the insignificance of the GHG impacts, those local impacts will not be meaningful to a decision on the environmentally preferable alternative or to a choice among alternatives. For these reasons, no alternatives-level GHG analysis has been performed for this project.

6 SUMMARY

The project is located in an area which is designated as attainment for all of the NAAQS under the criteria provided in the Clean Air Act. Therefore, the Clean Air Act conformity requirements do not apply to the project. However, the proposed project has the potential to influence the air quality within the project study area. Therefore, a project-level air quality analysis was conducted for the area surrounding the project corridor in accordance with guidelines contained in Part 2, Chapter 19 of the FDOT PD&E Manual.

Since CO is a localized pollutant, it is often analyzed at the project level for projects where substantial changes to the traffic conditions are anticipated. The NAAQs for CO is 35 PPM for one-hour periods and 9 PPM for eight-hour periods. The CO screening analysis for this project indicates that the worst-case one-hour CO level is 9.9 PPM during the build year and design year. The predicted worst-case eight-hour CO level is estimated to be 5.9 PPM during the build year and the design year.

The results of the CO screening analysis indicate the proposed project is not expected to cause any exceedances of the one-hour or eight-hour NAAQS for CO. Thus, the project passes the CO screening analysis, and air quality impacts resulting from the proposed project are not expected.

7 CONSTRUCTION

Construction activities for the proposed action may potentially have short-term air quality impacts within the immediate vicinity of the project. Construction activities may generate temporary increases in air pollutant emissions in the form of dust from earthwork and unpaved roads and smoke from open burning. Such emissions and potential impacts will be minimized by adherence to all applicable State and local regulations and to the FDOT's *Standard Specifications for Road and Bridge Construction*.

8 COORDINATION WITH LOCAL OFFICIALS

Agency coordination to obtain Air Quality related information occurred through the Efficient Transportation Decision Making (ETDM) and Advance Notification (AN) processes. The ETDM Environmental Technical Advisory Team (ETAT) review occurred during May and June 2015, and the latest version of the ETDM *Programming Screen Summary Report* (#14225) was published on August 13, 2015 and republished on February 01, 2016 and February 22, 2016. This report is on file at the District Four Planning and Environmental Management (PL&EM) Office and may be found online at <https://etdmpub.fla-etat.org/est/>. The AN was circulated on May 01, 2015, and only minor AN responses regarding air quality were received. Through the ETDM review process, the USEPA assigned the degree of effect to air quality due to the project as "minimal" since the project is not located in a non-attainment area. The FDOT has summarized the degree of effect on air quality as "minimal". Based on the air quality analysis conducted for this project, air quality impacts are not expected to occur as a result of this project.

APPENDIX

CO Florida 2012 Output

Opening Year (2020) No-Build

CO Florida 2012 - Results
Wednesday, May 24, 2017

Project Description

Project Title	FDOT 4 I-95/45th St PD&E		
Facility Name	I-95/45th St Interchange		
User's Name	CTS		
Run Name	No-Build Opening		
FDOT District	4		
Year	2020		
Intersection Type	E-W Freeway N-S Diamond		
Speed	Arterial	45 mph	Freeway 65 mph
Approach Traffic	Arterial	2570 vph	Freeway 10102 vph

Environmental Data

Temperature	53.9 F
Reid Vapor Pressure	13.3 psi
Land Use	Urban
Stability Class	D
Surface Roughness	175 cm
1 Hr. Background Concentration	5.0 ppm
8 Hr. Background Concentration	3.0 ppm

Results

(ppm, including background CO)

Receptor	Max 1-Hr	Max 8-Hr
1	9.9	5.9
2	7.5	4.5
3	7.9	4.7
4	8.0	4.8
5	7.7	4.6
6	7.9	4.7
7	8.2	4.9
8	7.8	4.7
9	6.9	4.1
10	9.6	5.8
11	9.9	5.9
12	7.5	4.5
13	7.8	4.7
14	8.0	4.8
15	7.7	4.6
16	8.0	4.8
17	8.2	4.9
18	7.8	4.7
19	6.9	4.1
20	9.7	5.8

*****PROJECT PASSES*****

NO EXCEEDANCES OF NAAQ STANDARDS ARE PREDICTED

Opening Year (2020) Recommended Build Alternative

CO Florida 2012 - Results
Wednesday, May 24, 2017

Project Description

Project Title	FDOT 4 I-95/45th St PD&E		
Facility Name	I-95/45th St Interchange		
User's Name	CTS		
Run Name	Build Opening Year		
FDOT District	4		
Year	2020		
Intersection Type	E-W Freeway N-S Diamond		
Speed	Arterial	45 mph	Freeway 65 mph
Approach Traffic	Arterial	2570 vph	Freeway 10102 vph

Environmental Data

Temperature	53.9 F
Reid Vapor Pressure	13.3 psi
Land Use	Urban
Stability Class	D
Surface Roughness	175 cm
1 Hr. Background Concentration	5.0 ppm
8 Hr. Background Concentration	3.0 ppm

Results

(ppm, including background CO)

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1	9.9	5.9
2	7.5	4.5
3	7.9	4.7
4	8.0	4.8
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6	7.9	4.7
7	8.2	4.9
8	7.8	4.7
9	6.9	4.1
10	9.6	5.8
11	9.9	5.9
12	7.5	4.5
13	7.8	4.7
14	8.0	4.8
15	7.7	4.6
16	8.0	4.8
17	8.2	4.9
18	7.8	4.7
19	6.9	4.1
20	9.7	5.8

*****PROJECT PASSES*****
NO EXCEEDANCES OF NAAQ STANDARDS ARE PREDICTED

Design Year (2020) No-Build

CO Florida 2012 - Results
Wednesday, May 24, 2017

Project Description

Project Title	FDOT 4 I-95/45th St PD&E		
Facility Name	I-95/45th St Interchange		
User's Name	CTS		
Run Name	No Build Design Year		
FDOT District	4		
Year	2040		
Intersection Type	E-W Freeway N-S Diamond		
Speed	Arterial	45 mph	Freeway 65 mph
Approach Traffic	Arterial	3239 vph	Freeway 11579 vph

Environmental Data

Temperature	53.9 F
Reid Vapor Pressure	13.3 psi
Land Use	Urban
Stability Class	D
Surface Roughness	175 cm
1 Hr. Background Concentration	5.0 ppm
8 Hr. Background Concentration	3.0 ppm

Results

(ppm, including background CO)

Receptor	Max 1-Hr	Max 8-Hr
1	9.9	5.9
2	7.6	4.6
3	7.6	4.6
4	7.7	4.6
5	7.3	4.4
6	7.9	4.7
7	8.3	5.0
8	7.8	4.7
9	6.8	4.1
10	9.5	5.7
11	9.9	5.9
12	7.6	4.6
13	7.6	4.6
14	7.6	4.6
15	7.3	4.4
16	7.9	4.7
17	8.3	5.0
18	7.8	4.7
19	6.8	4.1
20	9.5	5.7

*****PROJECT PASSES*****

NO EXCEEDANCES OF NAAQ STANDARDS ARE PREDICTED

Design Year (2040) Recommended Build Alternative

CO Florida 2012 - Results
Wednesday, May 24, 2017

Project Description

Project Title	FDOT 4 I-95/45th St PD&E		
Facility Name	I-95/45th St Interchange		
User's Name	CTS		
Run Name	Build Design Year		
FDOT District	4		
Year	2040		
Intersection Type	E-W Freeway N-S Diamond		
Speed	Arterial	45 mph	Freeway 65 mph
Approach Traffic	Arterial	3239 vph	Freeway 11579 vph

Environmental Data

Temperature	53.9 F
Reid Vapor Pressure	13.3 psi
Land Use	Urban
Stability Class	D
Surface Roughness	175 cm
1 Hr. Background Concentration	5.0 ppm
8 Hr. Background Concentration	3.0 ppm

Results

(ppm, including background CO)

Receptor	Max 1-Hr	Max 8-Hr
1	9.9	5.9
2	7.6	4.6
3	7.6	4.6
4	7.7	4.6
5	7.3	4.4
6	7.9	4.7
7	8.3	5.0
8	7.8	4.7
9	6.8	4.1
10	9.5	5.7
11	9.9	5.9
12	7.6	4.6
13	7.6	4.6
14	7.6	4.6
15	7.3	4.4
16	7.9	4.7
17	8.3	5.0
18	7.8	4.7
19	6.8	4.1
20	9.5	5.7

*****PROJECT PASSES*****

NO EXCEEDANCES OF NAAQ STANDARDS ARE PREDICTED
