

Preliminary Engineering Report

City of Plantation
Midtown Bridge – New Bridge Construction
Project Development and Environment (PD&E) Study

Financial Project ID: 448884-1-22-01

ETDM Number: 14481



PREPARED FOR:
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Preliminary Engineering Report

City of Plantation
Midtown Bridge - New Bridge Construction
Project Development and Environment (PD&E) Study from SR 84 to SW 17 Street
Broward County, Florida

FM Number: 448884-1-22-01

ETDM Number: 14481

Date: March 2022

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Florida.

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Pages or sheets covered by this seal: Entire Report

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1 Project Summary

1.1 Project Description

This Preliminary Engineering Report (PER) has been prepared as part of the Project Development and Environment (PD&E) study that proposes to construct a new bridge connection between the Plantation Midtown District, in the City of Plantation, and Westbound (WB) SR 84. The bridge is being proposed as a new connector to relieve existing and future traffic congestion on Pine Island Road and University Drive in proximity to the proposed bridge.

The project study area is bounded by the Pine Island Road intersections at Peters Road and SR84/I-595 to the west, Peters Road on the north, SR 84 eastbound on the South and the University Drive intersections at Peters Road and State Road (SR) 84/I-595 to the east. The proposed new connection could be 200 feet in length from WB SR 84 to the south and SW 17th Street to the north. Figure 1-1 shows the study area and potential location of a new bridge connection.

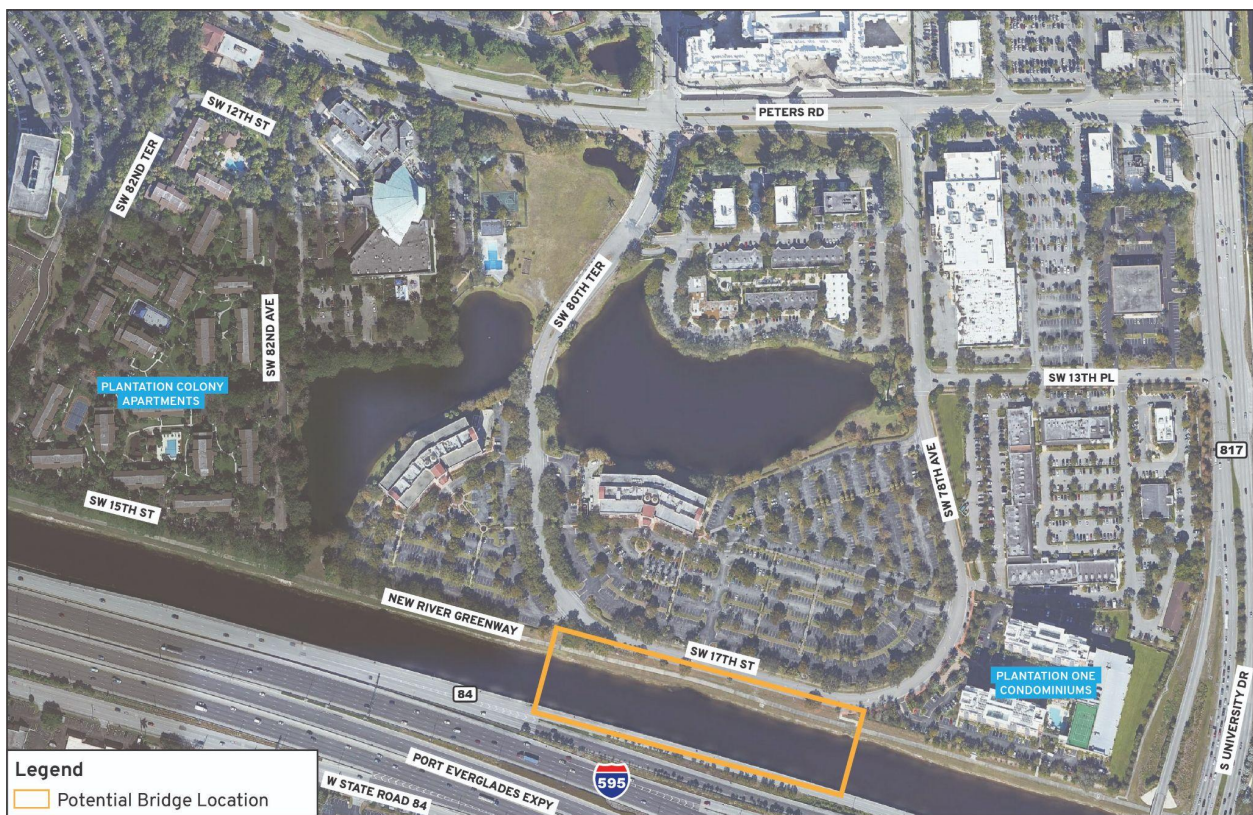


Figure 1-1. Study Area and Potential Location for New Bridge

1.2 Purpose & Need

1.2.1 Purpose

The purpose of this study is to address congestion in the Midtown District of the City of Plantation, Broward County, Florida. This study will supplement the joint Broward Metropolitan Planning Organization (Broward MPO)/Florida Department Of Transportation District 4 (FDOT 4) I-595 Arterial Connectivity Study (I-595 ACS). The I-595 ACS is a project where the Broward MPO and FDOT 4 partnered to conduct a planning study to address connectivity for all modes and congestion along eight (8) north-south arterial corridors that intersect with I-595 and SR 84 in Central Broward County. The study area for the I-595 ACS included the Pine Island Road and University Drive corridors approximately one (1) mile north and south of I-595. This Midtown Plantation Bridge study will supplement that effort by analyzing alternatives for the location of a new bridge over the South Florida Water Management District (SFWMD) New River Canal between Westbound (WB) SR 84 and SW 17th Street.

The I-595 ACS includes an extensive list of recommended improvements for both Pine Island Road and University Drive. Including:

- Recommended improvements for the **Pine Island Road corridor** include SR 84 / I-595 interchange improvements, intersection improvements at SW 6th Court, Peters Road, and Nova Drive, as well as multimodal improvements. To address the SR 84 interchange deficiencies, the modified diamond interchange with overpasses alternative is recommended for further analysis, design, and implementation. Standard intersection lane improvements are also proposed for the three additional intersections along Pine Island Road where the LOS will not meet the target LOS D. Turn lanes are proposed at: SW 6th Court, Peters Road, and Nova Drive.

The recommended Pine Island Road corridor concept also includes new bicycle lanes where they are missing in the northbound direction between Orange Grove Drive and eastbound SR 84. The existing bus stops on Pine Island Road were reviewed to determine whether any need a bench or a shelter. All four of the bus stops located on Pine Island Road between SR 84 and SW 3rd Street have benches, but not shelters. Daily activity at all four bus stops is greater than 10. Therefore, a shelter is recommended for the four BCT stops (#3572, 3573, 3574, and 3575) along Pine Island Road.

- Recommended improvements for the **University Drive corridor** include roadway capacity improvements along University Drive north and south of SR 84, improvements at the SR 84 / I-595 interchange, and intersection improvements at Peters Road, Nova Drive, and SW 30th Street. Corridor improvements also include multimodal improvements such as added sidewalk, bicycle lanes, and bus stop improvements. These improvements are recommended for further analysis, design, and implementation to address the safety, capacity, and operational deficiencies. At the University Drive and Peters Road intersection, the additional lanes at-grade intersection alternative is recommended as the best alternative.

The recommended University Drive corridor concept includes wider bicycle lanes along University Drive within the study limits, which is in keeping with FDOT's ongoing bicycle lane design and construction project along University Drive (FM#432066). The recommended improvements also include adding sidewalk where it is currently missing on the east side of University Drive between Peters Road and Federated Road.

The additional fourth through lane recommended along University Drive in each direction may be utilized as a bus and access lane. The recommended additional lane along University Drive can help with implementation of premium transit service along the corridor in the future. Proposed transit improvements include bus stop shelters where needed for the existing stops along University Drive.

The I-595 ACS did perform a preliminary analysis of a bridge alternative on daily traffic. The analysis was performed utilizing a year 2045 sub area travel demand model simulation of the study area including a north/south bridge between SW 17th Street and WB SR 84 approximately 1,600 feet west of University Drive. The results showed that the bridge would provide additional capacity and provide for traffic congestion relief/reductions on Pine Island Road from Peters Road to the I-595 Interchange and on University Drive from Peters Road to the I-595 Interchange. The I-595 ACS analysis of the bridge was for daily traffic only.

This Plantation Midtown Bridge Study Project Development & Environment (PD&E) effort performed a detailed analysis of safety and Year 2021 Existing, 2025 Build Year and Year 2045 peak hour traffic for implementation of the bridge project only so as to assess its impact. The results show that construction of the new bridge will provide for immediate and long term areawide operational and safety benefits. The benefits include reductions in travel time and intersection delays and approach queue lengths as compared to the No-Build scenario, as follows:

- Once the bridge is constructed, the 2025 Build Alternative analysis shows reductions in intersection delays and some approach queue lengths. For example, University Drive at Peters Road experiences a 15% reduction in delay during the morning peak hour and the SR 84 WB intersection delay is reduced by 5%. Likewise, the intersection of Pine Island Road and SR 84 WB experiences a 3% delay reduction during both peak hours. In addition, the new bridge connections at SW 17th Street and at SR 84 westbound operate well at LOS A and B, respectively, during the peak hours.
- The benefits of building the bridge will be long term. By 2045 University Drive at Peters Road experiences a 13% reduction in delay during both peak hours, while delay at the SR 84 WB intersection is reduced by 25% during the PM. Likewise, the intersection of Pine Island Road and SR 84 WB experiences a 5% delay reduction during the AM peak hour. The Bridge connections continue to operate acceptably well at LOS B/C and A/A during the AM/PM peak hours at SW 17th Street and at SR 84 westbound, respectively.

The safety analysis shows additional benefits to building the bridge as there will be short and long term expected crash reductions. Southbound (SB) University Drive traffic is expected to experience reduced instances of tailgating and providing more adequate gaps during the peak hours. This can prevent

rear-end and sideswipe crashes during the traffic congestion periods. Overall, the proposed bridge connector is anticipated to improve safety through less traffic interaction and increased mobility on the adjacent roadways.

Capacity

University Drive, is between 1,000' and 1,700' to the east of the proposed project, and is a 6-lane divided roadway with 22-foot wide median, 6-foot-wide sidewalks, 5-foot-wide bike lanes and served 78,500 Average Annual Daily Traffic (AADT) vehicles north of I-595, in 2019. Pine Island Road, to the west of the project, is a 6-lane divided roadway with 24-foot wide median, 6-foot-wide sidewalks, 5-foot-wide bike lanes in and serving 52,000 AADT in 2019 north of I-595. University Drive is currently operating below the Daily Level of Service (LOS) target 'D' for the State Highway System, at LOS F, both north and south of I-595. The Pine Island Road corridor is currently operating above the Daily LOS target at LOS C. A 2019 peak hour intersection analysis shows that both University Drive and Pine Island Road intersections at SR 84 are operating at LOS E or F during the peak periods, as follows:

- University Drive / SR 817 at SR 84 WB - The WB movements all experience long delays, which causes the intersection to operate at LOS E in the AM peak hour.
- University Drive / SR 817 at Peters Road - The intersection operates at LOS E during the AM peak hour.
- Pine Island Road at SR 84 WB in both AM and PM peak hours - The intersection operates at an overall LOS F during both the AM peak hour and PM peak hour.

Transportation Demand

The Plantation Midtown District encompasses approximately 860 acres and is bounded by University Drive to the east, Interstate I-595 to the south, Pine Island Road to the west, and Cleary Boulevard to the north. The Plantation Midtown Master Plan was adopted in November of 2003 and is focused on the retrofit/revitalization of the area that has been characterized by suburban sprawl, auto-orientation, and pedestrian impediments to a transit-oriented design with strong pedestrian components. The Master Plan has progressed where the Plantation Midtown District has evolved into a regional hub of commercial and employment activities with residential neighborhoods that have a significant daytime employee population. Future growth in the City of Plantation is expected to continue to be focused within the Plantation Midtown Area.

The Traffic Analysis Report developed peak hour traffic in the study area by collecting Year 2021 data and estimating demand for Year 2025 opening Year and Year 2045 traffic for both the no-build and build bridge conditions based on traffic growth rates. Existing year 2021 peak hour volumes were developed for the entire study area by following approved processes and techniques consistent with the latest version of the 2019 FDOT's Project Traffic Forecasting Handbook. Intersection turning movement counts were plotted on a spreadsheet. In order to comply with FDOT District 4 Planning's policy on seasonal adjustments, no factors were applied to the raw turning movement counts. As for the peak hour TMCs, the individual peak hours for the TMCs were used since the counts were collected on different dates

throughout the network.

The 2025 and 2045 future year No Build scenario traffic volumes were developed by applying an appropriate growth rate to each study segment's 2021 traffic volume. Similar to the ACS report, a comparison was made of the three types of growth rates: historical growth rates from trend analysis, growth rates from model volumes, and the surrounding population and employment growth projections.

Peak hour turning movement volume projections were prepared for 2045 No-Build conditions using the TMTTool spreadsheet and some minor manual adjustments. The same methodology as the ACS report was applied for the Build condition. The SERPM 8.512 model was used to develop Annual Average Daily Traffic projections for the 2045 Build condition. A two-lane, two-way roadway link was added to the model between SR 84 westbound and Peters Road. Using the Build AADT and existing turning movement counts, balanced Build turning movement volumes were developed for AM and PM peak hours.

Details of the future traffic demand are provided separately in the Traffic Analysis Report "Traffic Forecasting for Plantation Midtown Bridge Improvement PD&E Study & Design Services" report. In addition, pedestrian and bicycle volumes were grown accordingly at the intersections and at the new bridge crossing south of SW 17th Street using the same growth rate that was applied to the traffic volumes.

System Linkage

The City of Plantation is evaluating both short-term and long-term options to improve the transportation network in Midtown to accommodate the anticipated growth. Strategies include building the proposed bridge between University Drive and Pine Island Road to provide direct access to and from WB SR 84. The proposal is specifically intended to reduce congestion on the existing nearby roadways and to create better system linkages with a complementary network supporting Pine Island Road and University Drive. The new access bridge connection between SW 17th Street and SR 84, addresses the City's overall vision for the Midtown District including a north-south connector in the middle of the Midtown District which would run parallel to University Drive and Pine Island Road.

Economic Development

The City's primary objectives to plan for a town center in Plantation is to promote revitalization and redevelopment opportunities, strengthen the area's existing economic foundation, encourage mixed use by inclusion of residential development, enhance vehicular mobility by improvements to the transportation system, and create a pedestrian-friendly environment.

The Master Plan promotes economic revitalization to be implemented by increasing both the number of permanent residents living in Central Plantation and the number of visiting consumers. Regulations have been established to encourage infill development, increased parking densities.

The results of the screenline analysis performed in the completed september 2020 Midtown Bridge Traffic Data and Traffic Projections Technical Memorandum indicates that the proposed new bridge connection increases the opportunity for increased growth and economic development as the analysis of

the 2045 Build Scenario showed 7,076 more AADT entering the study area than the No-Build Scenario.

Modal Interrelationships

The Master Plan places a high priority on making the Midtown District a pedestrian friendly environment. Pedestrian pathways should connect the disparate parts of the area, be wide and lighted, and buffered from vehicular traffic with landscaping. The City of Plantation may also explore opportunities for a service connection to the I-595 Express Bus system that currently passes by the Plantation Midtown District on I-595. Service could utilize the new bridge and directly connect to the Midtown residents and businesses with direct express service to the City of Sunrise, TriRail and Downtown Miami.

1.2.2 Need

As previously mentioned, the Plantation Midtown Bridge project was part of the joint Broward MPO/FDOT 4 Arterial Connectivity Study Along I-595 that is included in the Broward MPO 2021 to 2025 TIP as FM# 441954-1 on page 7-1-33. The need for the bridge project is documented in Technical Memorandum 2: Midtown Bridge Traffic Data and Traffic Projections Technical Memorandum that was completed in September 2020.

Pedestrian Bicycle Accommodations

The proposed bridge alternative will bisect the New River Greenway on the northside of the canal outside of the Limited Access Facility (LAF) boundary.

Navigational Needs

A new bridge may have implications to navigation if the waterway is navigable. As for the Plantation Midtown Bridge, there are low level bridges upstream and downstream that already limit navigation and since the bridge is on the west side of the SFWMD Broward Memorial Lock, located west of the Florida's Turnpike, this project study area should not be considered navigable waters. It is anticipated the bridge structures will generally have the same dimensions and height as the Pine Island Road and University Drive bridges.

Logical Termini

Figure 1-1 shows the bridge location area is between 1,000' to 1,700' west of the centerline of University Drive. The actual location of the bridge will be determined in this study. Locational factors for the south and north termini include WB SR 84 travel speeds, design of a proposed ramp west bound I-595 ramp from the I-595 ACS study, adequate merging and weaving distance to I-595, access management requirements, distance from the University Drive/SR 84 intersection, access to development within the Plantation Midtown District, right-of-way and any potential environmental issues related to crossing of the New River Canal. Analysis will include intersection concepts and impacts on SW 17th Street and WB SR 84 at the Bridge and along Peters Road at 80th Terrace and 78th Avenue.

1.2.3 Project Status

The Plantation Midtown Bridge project was analyzed as part of the joint Broward Metropolitan Planning

Organization (Broward MPO)/Florida Department of Transportation District 4 (FDOT 4) Arterial Connectivity Study Along I-595. This study is shown in the Broward MPO 2021 to 2025 Fiscal Years (FY) Transportation Improvement Program (TIP) Financial Management Number (FM#) 441954-1 on page 7-1-33. The need for the bridge project is documented in Technical Memorandum 2: Midtown Bridge Traffic Data and Traffic Projections Technical Memorandum that was completed in September 2020.

The project is within the jurisdiction of the Broward MPO and is identified as a roadway need, and is included in the adopted 2045 Metropolitan Transportation Plan (MTP).

	Social and Economic							Cultural and Tribal			Natural			Physical								
	Social	Economic	Land Use Changes	Mobility	Aesthetic Effects	Relocation Potential	Farmlands	Section 4(f) Potential	Historic and Archaeological Sites	Recreational and Protected Lands	Wetlands and Surface Waters	Water Resources	Floodplains	Protected Species and Habitat	Coastal and Marine	Noise	Air Quality	Contamination	Infrastructure	Navigation	Special Designations	
Alternative #1 - New Bridge <i>Published: 02/18/2022 Reviewed from 11/12/2021 to 12/27/2021</i>	2	1	2	1	2	2	N/A	3	3	3	3	3	2	2	2	2	2	2	2	2	N/A	3

Figure 1-2. ETDM Summary Report

The purpose and need, and potential effects were screened through the Efficient Transportation Decision Making (ETDM) process and documents in the ETDM programming screening report (#14481, 02/18/2022). The results of the Environmental Technical Advisory Team (ETAT) program screen view is shown in Figure 1-2. The degree of effect assigned for several project issuers were minimal, moderate, enhanced, or none. Below, Figure 1-3 provides the Degree of Effect Legend. A moderate degree effect was given to all categories in the Cultural and tribal category, wetlands and surface waters, and water resources, and special designations. An enhanced degree effect was given to Economic and Mobility. The project has a positive effect on the ETAT resource or can reverse a previous adverse effect leading to environmental improvement as stated in the Degree of Effect Legend.

Degree of Effect Legend			
Color Code	Meaning	ETAT	Public Involvement
N/A	Not Applicable / No Involvement	There is no presence of the issue in relationship to the project, or the issue is irrelevant in relationship to the proposed transportation action.	
0	None (after 12/5/2005)	The issue is present, but the project will have no impact on the issue; project has no adverse effect on ETAT resources; permit issuance or consultation involves routine interaction with the agency. The <i>None</i> degree of effect is new as of 12/5/2005.	No community opposition to the planned project. No adverse effect on the community.
1	Enhanced	Project has positive effect on the ETAT resource or can reverse a previous adverse effect leading to environmental improvement.	Affected community supports the proposed project. Project has positive effect.
2	Minimal	Project has little adverse effect on ETAT resources. Permit issuance or consultation involves routine interaction with the agency. Low cost options are available to address concerns.	Minimum community opposition to the planned project. Minimum adverse effect on the community.
2	Minimal to None (assigned prior to 12/5/2005)	Project has little adverse effect on ETAT resources. Permit issuance or consultation involves routine interaction with the agency. Low cost options are available to address concerns.	Minimum community opposition to the planned project. Minimum adverse effect on the community.
3	Moderate	Agency resources are affected by the proposed project, but avoidance and minimization options are available and can be addressed during development with a moderated amount of agency involvement and moderate cost impact.	Project has adverse effect on elements of the affected community. Public Involvement is needed to seek alternatives more acceptable to the community. Moderate community interaction will be required during project development.
4	Substantial	The project has substantial adverse effects but ETAT understands the project need and will be able to seek avoidance and minimization or mitigation options during project development. Substantial interaction will be required during project development and permitting.	Project has substantial adverse effects on the community and faces substantial community opposition. Intensive community interaction with focused Public Involvement will be required during project development to address community concerns.
5	Potential Dispute (Planning Screen)	Project may not conform to agency statutory requirements and may not be permitted. Project modification or evaluation of alternatives is required before advancing to the LRTP Programming Screen.	Community strongly opposes the project. Project is not in conformity with local comprehensive plan and has severe negative impact on the affected community.
5	Dispute Resolution (Programming Screen)	Project does not conform to agency statutory requirements and will not be permitted. Dispute resolution is required before the project proceeds to programming.	Community strongly opposes the project. Project is not in conformity with local comprehensive plan and has severe negative impact on the affected community.
	No ETAT Consensus	ETAT members from different agencies assigned a different degree of effect to this project, and the ETDM coordinator has not assigned a summary degree of effect.	
	No ETAT Reviews	No ETAT members have reviewed the corresponding issue for this project, and the ETDM coordinator has not assigned a summary degree of effect.	

Figure 1-3. ETDM Degree of Effect Legend

1.3 Planning Consistency

The project is consistent with local planning agency plans. The project is within the jurisdiction of the Broward MPO and is identified as a roadway need, and is included in the adopted 2045 Metropolitan Transportation Plan (MTP) as shown in Table 1-1 and Figure 1-4.

Table 1-1. Broward MPO 2045 MTP Roadway Needs Plan (2025-2045) Page 5-25

Ref. ID	Project Sponsor	Jurisdiction	Project Name	Project Limits	Project Description	Total Cost (2019\$)	Timeframe for Implementation				
							2025	2026/30	2031/35	2036/45	
109	City of Plantation	Non-State	Plantation Midtown N-S Spine Rd Extension		Extend N-S spine road in Midtown District; acquire right-of-way and construct bridge across New River Canal to westbound SR-84.	\$56,937,062					Unfunded

The Broward MPO 2045 Metropolitan Transportation Plan (MTP) Roadway 2045 Needs Plan Map 4-2 from page 4-12 of the plan shows the location of the bridge, see Figure 1-4 below. The project is shown

as part of a larger proposal described in the MTP as: “Extend a North/South (N/S) spine road in Midtown District; acquire right-of-way and construct bridge across New River Canal to westbound SR-84.”

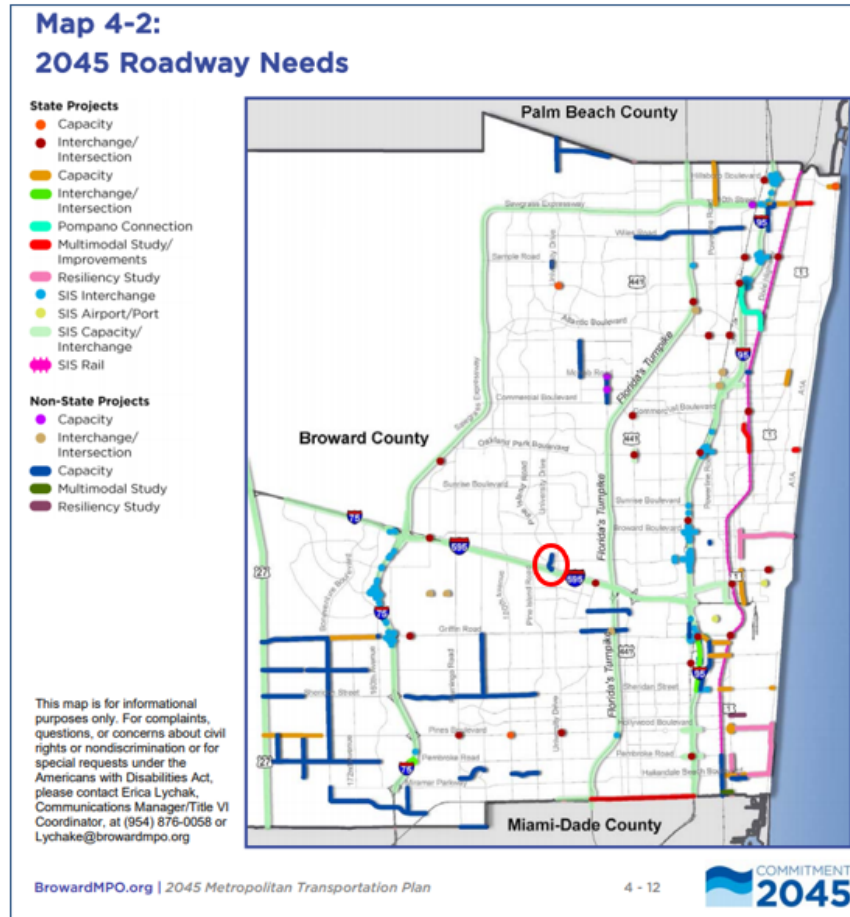


Figure 1-4. Broward MPO 2045 MTP Roadway Needs Plan Map page 4-12

1.4 Commitments

At the time of preparation of this document, the following commitments are included:

- Air pollution during construction associated with the creation of airborne particles will be controlled using watering or the application of other control materials in accordance with FDOT’s Standard Specifications for Road and Bridge Construction.
- All applicable best management practices contained in the latest editions of the FDOT Standard Specifications for Road and Bridge Construction and the Construction Project Administration Manual will be adhered to during construction of the planned improvements.
- Minimization of wetland and surface water impacts will be evaluated further during the design phase of the project to the extent possible, i.e. changes in the typical section to avoid and minimize wetland impacts and use of BMPS to avoid and minimize impacts to water quality.
- Coordination with the appropriate regulatory agencies will be conducted throughout the design

phase for permitting; FDOT's Standard Specifications for Road and Bridge Construction will be adhered to during the construction phase of the project.

- A Stormwater Management Plan will be developed to provide conveyance and treatment for stormwater runoff from impervious surfaces.
- Standard Manatee Conditions for In-water activities to be implemented during construction. The USFWS Standard Protection Measures for the Eastern Indigo Snake will be implemented to ensure no adverse impacts to the species occur during construction.

1.5 Alternatives Analysis Summary

Viable alternatives evaluated in the PD&E study were based on two locations for the bridge.

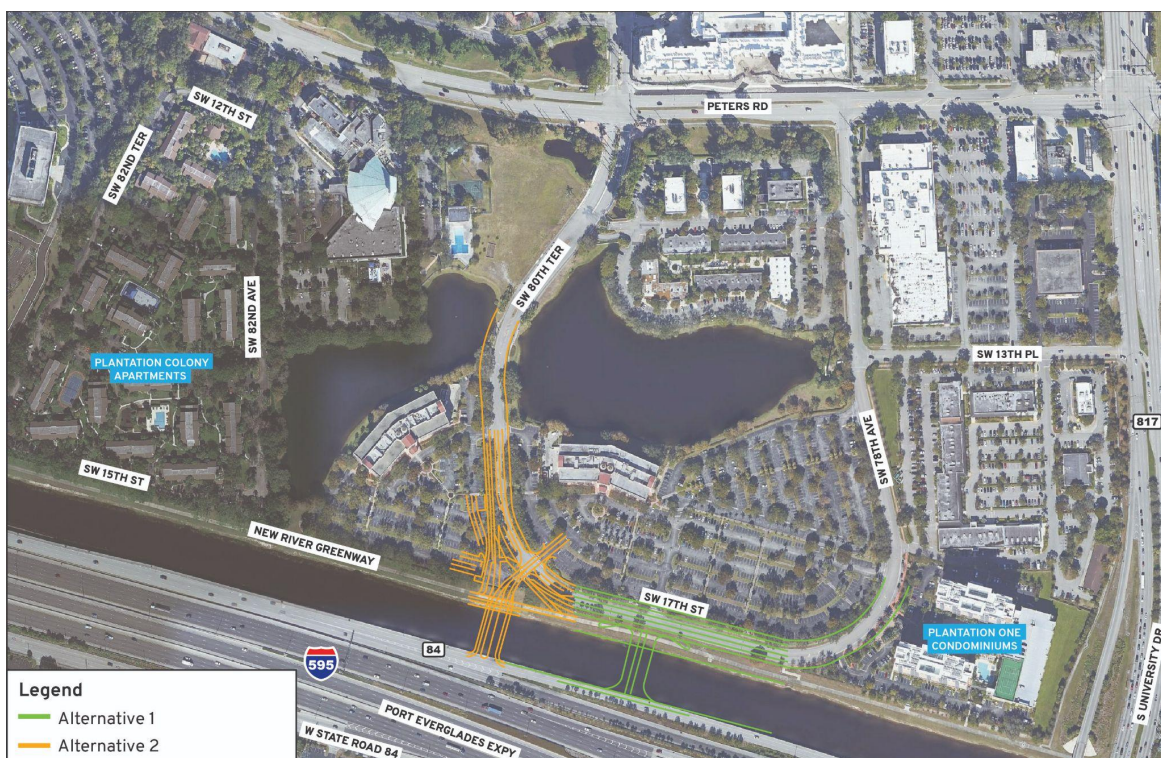


Figure 1-5. Bridge Alternatives 1 and 2

1.6 Description of Preferred Alternative

The Preferred Alternative is Alternative 1. Alternative 1 and 2 were determined to have the same positive safety and traffic impacts and, in addition, Alternative 1 was found to provide a direct connect to the office park driveway, does not require any private property right-of-way, has the least traffic conflict points, creates only one conflict point with the New River Greenway and is better spaced to connect to WB SR 84 related to vehicle merging between I-595 and WB SR 84. The Alternative Matrix below shows that Alternative 1 is the best option compared to the No-Build Scenario and the Build Alternative 2.

Table 1-2. Alternatives Evaluation Matrix

Measure of Effectiveness		No-Build	Alternative 1	Alternative 2
Safety		No Improvement	Crash Reduction	Crash Reduction
Purpose				
	Capacity	No Improvement	Reduced Delay on Pine Island and University Drive	Reduced Delay on Pine Island and University Drive
	Transportation Demand	No Improvement	Provides 3 Lanes New Capacity	Provides 3 Lanes New Capacity
	System Linkage	No Improvement	New Connector	New Connector
	Economic Development	No Impact	Improved Access to South District	Improved Access to South District
	Modal Interrelationships	No Improvement	Opportunity to Connect to 595 Express	Opportunity to Connect to 595 Express
Infrastructure				
	Private Right of Way	No Impact	No ROW Required	-25,320 Sqft (.58 Acres)
	Private Parking	No Impact	No Private Property Impacts	-12 Spaces
	Traffic Conflict Points	No Impact	4 - Way Stop	Creates a new merge point for SB Traffic on Bridge
	New River Greenway	No New Roadway Crossing	One New Conflict Point	Two New Conflict Points
	Proximity to WB SR 84 and WB 595 Merge Point	No Impact	1,000 Feet From Merge Point	600 feet from Merge Point and within Gore Area
	Tree Impacts	No Impact	May Impact 1 Tree. Provide for New Landscape.	Remove/ Relocate 11 Trees
	Cost	N/A	Will Require a Lower Cost than Alternate 2 for for Vertical Clearance impacts	Will Require a Higher Cost (+ 1.0 Million) than Alternate 1 as there are Vertical Clearance needs for both WB
Environmental				
	Air	No Impact	Short-term impacts to air quality through airborne dust and other ambient air pollutants during construction	Short-term impacts to air quality through airborne dust and other ambient air pollutants during construction
	Noise	No Impact	Negligible given location near 595 and SR 84	Negligible given location near 595 and SR 84
	Contamination	No Impact	No Impact	No Impact
	Cultural Resources	No Impact	Low potential for containing intact archaeological sites	Low potential for containing intact archaeological sites
	Natural Resources	No Impact	Very minor impact to surface water	Very minor impact to surface water
TOTAL POINTS		-5	10	-2
	+2 Pts		Significant Positive Impact	
	+1 Pts		Positive Impact	
	0 Pts		No Change	
	-1 Pt		Negative Impact	
	-2 Pts		Significant Negative Impact	

1.7 List of Technical Documents

The following is a list of the technical documents prepared for this study:

- Air Quality Technical Memorandum
- Bridge Analysis Technical Memorandum
- Contamination Screening Evaluation Report
- Cultural Resource Assessment Survey
- Geotechnical Services - Memo Report
- Bridge Analysis Report
- Natural Resources Evaluation
- Noise Study Report
- Preliminary Engineering Report
- Public Involvement Plan
- Safety Technical Memorandum
- Sociocultural Effects Technical Memorandum
- State Environmental Impact Report (to be completed after approval of this report)
- Traffic Analysis Report

2 Existing Conditions

During this PD&E Study a detailed assessment of the existing conditions was conducted that included a review of existing plans, project reports, approved development in the study area and historical records. Several field reviews were conducted by engineers and planners to verify information reviewed in the office and to check existing roadway features. Additional data was collected that included project aerial photography, limited topographic and right-of-way surveys.

2.1 Roadway

2.1.1 SW 17 Street/81 Terrace/78th Avenue

The proposed Alternative 1 bridge connects SW 17th Street to Westbound SR 84. SW 17th Street becomes SW 81 Terrace to the west of the project and SW 78 Avenue to the East of the Bridge. We will refer to these 3 roads as the SW 17th Street loop road.

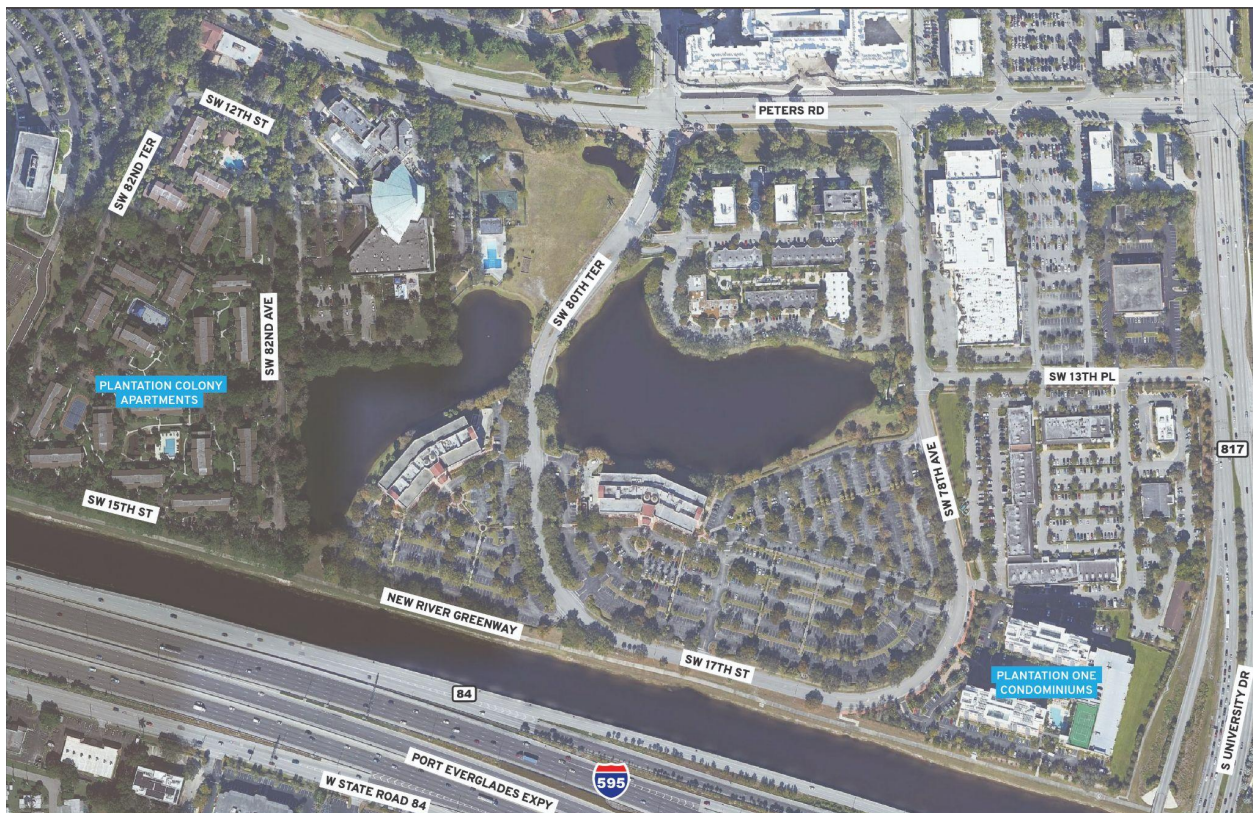


Figure 2-1. Local Street “Loop Road”

SW 17 Street's typical section consists of a two lane undivided roadway with a center two-way-left-turn lane. The roadway has two-foot paved outside on one side and a dropped curb on the other side; a 6-ft swale and sidewalk on the north side and a swale and a 12-ft trail on the south side. The design and posted speed is 30 mph. The existing right-of-way width is generally 60 feet. The existing typical section

is shown in **Figure 2-2**.

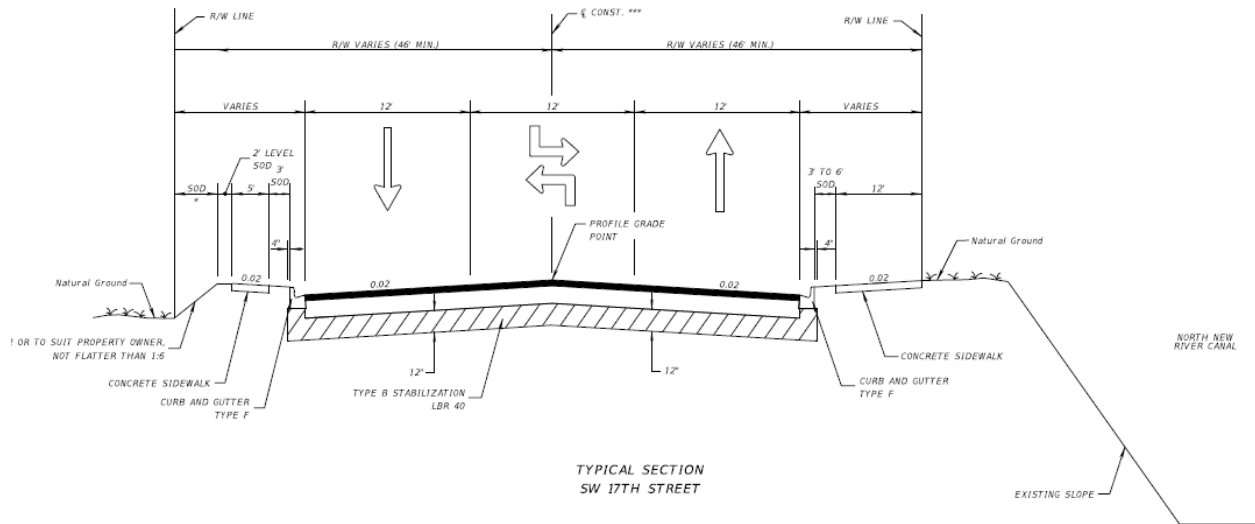


Figure 2-2. Existing SW 17 Street Typical Section

2.1.2 West Bound SR 84

Westbound SR 84 is the perimeter road for i-595. It's an East-west corridor. The typical section within the limits of this project includes two 12-ft lanes with curb and gutter on the south side and 10-ft shoulder on the north side with a barrier wall.

The existing typical section is shown in **Figure 2-3**

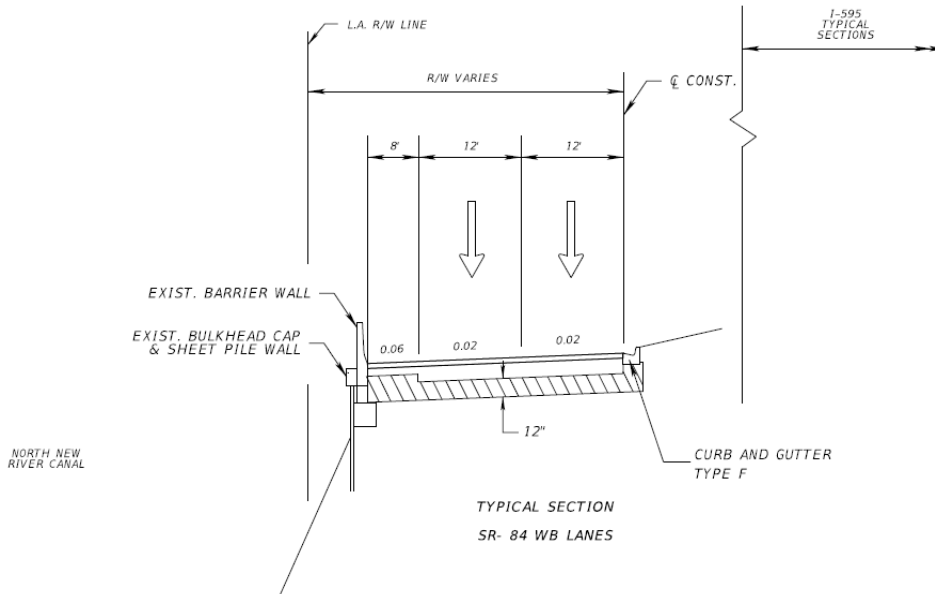


Figure 2-3. Existing SR 84 Typical Section Right-of-Way

The proposed bridge will be constructed entirely within the SFWMD’s right of way. A right of way occupancy will be obtained. The bridge will connect to SR 84/I595 which is FDOT right of way. SR -84 in this segment has a Limited Access right of way because of its proximity to I-595. This PD&E Study is part of the documentation needed for the approval to break the Limited Access line at the location of the new bridge. The existing right-of-way widths for the study area are summarized in **Table 2-1**.

Table 2-1. Existing Right-of-Way Widths

Roadway	Existing Right-of-Way Width
SW 17 Street	
SR 84/ I-595	

2.2 Roadway Classification & Context Classification

The context classification of a roadway helps to make informed decisions during various project development phases, so that roadways are planned, designed, constructed, and maintained to support safe and comfortable travel for their anticipated users. Context classification helps identify the anticipated users of the roadway improvement. The FDOT context classification guide 2020 is used to describe the context class while functional class information is obtained from the Functional Classification and Urban Boundary Maps. **Table 2-2** details the functional and context classification for the roadways within the study area. There is no applicable roadway or context classification for SW 17th Street(*) since it is not under FDOT jurisdiction, the classification is devised based on the FDOT Context Classification Guide.

Table 2-2. Roadway Functional and Context Classification

Roadway	Functional Classification	Context Classification
SR 84	Minor Arterial	C1
Peters Road	Major Collector	C4
University Drive	Principal Arterial	C4
SW 17th Street*	Urban Local*	C4*
Pine Island Road	Minor Arterial	C4

2.3 Adjacent Land Use

The existing land use for the study area was determined through document review, the ETDM Environmental Screening tool, City of Plantation Maps, and aerial photographic analysis.

To the west of the study area is a parking lot for the Plantation Corporate Center 1 and the future land use classification for the parcel is Office Park (Limited Commercial). To the east of the study area are commercial business and residential units located along North University Drive. The land use classification for the parcels located east of N. University drive, adjacent to the study area is commercial.

Figure 2-4, Future Land Use Map, classifies the land use in the study area.

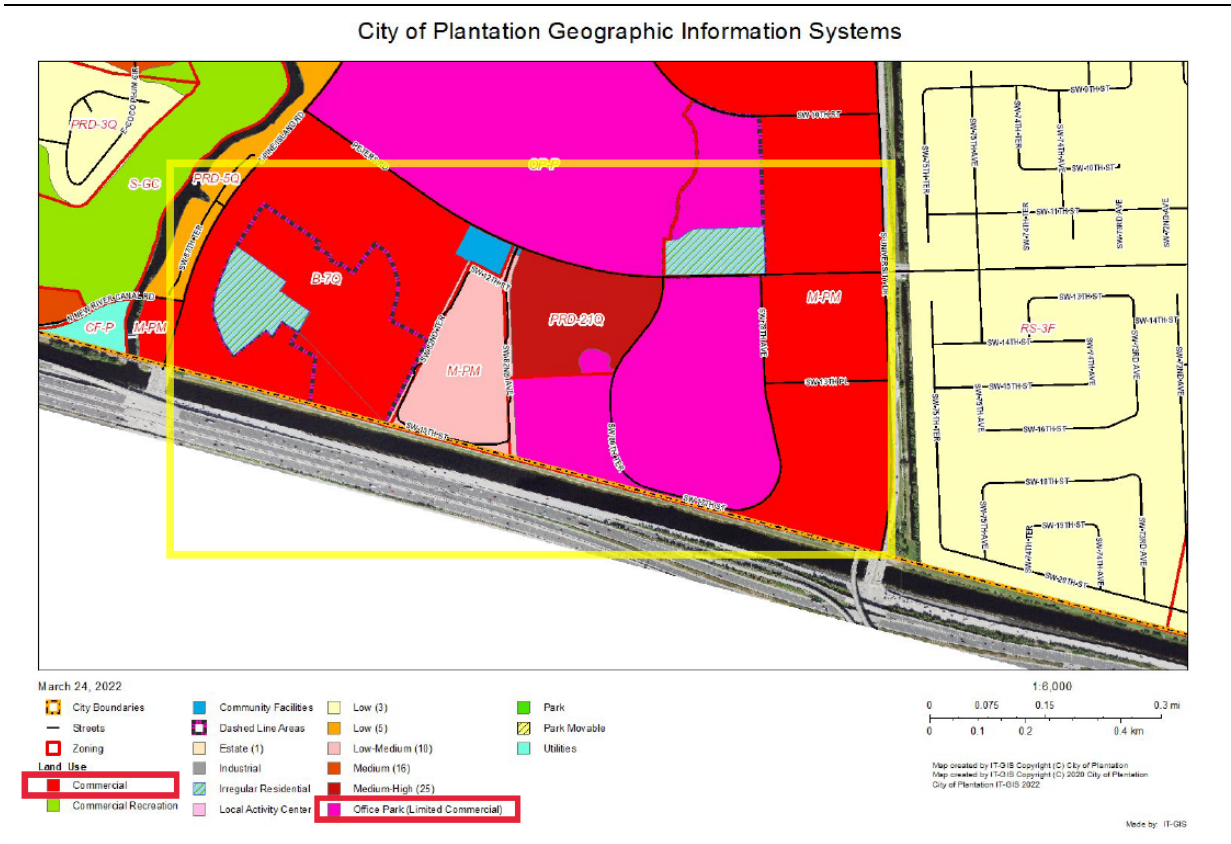


Figure 2-4. Future Land Use Map

2.4 Access Management Classification

Roadway access classification and the posted speed limit of the highway/road segment is critical to determine what roadway features and access connection modifications are appropriate to adhere to the access management process. The FDOT District 4 Access Management Classification KMZ file was reviewed for access management classifications for the State Roads such as SR 817/University Drive and SR 84/I-595. Other roads such as Pine Island Road, Peters Road and SW 17th Street were not shown in the KMZ file as they are not under FDOT jurisdiction but the Access Class is derived as per Table 3 of Access Management Guidebook 2019. Access Management Classification of each roadway is provided in Table 2-3.

Table 2-3. State Road Access Management Classification

Roadway	Access Management Classification
SW 17 Street and Midtown Bridge	6
SR 84/I-595	1 (Limited Access)
Pine Island	3

SR 817/University Drive	3
Peters Road	3

2.5 Design and Posted Speeds

Design and posted speed limits are listed in **Table 2-4** below.

Table 2-4. Design and Posted Speed Limits

Roadway	Location	Posted Speed	Design Speed
SR-84	WB	45 mph	45 mph
SW 17th Street	EB and WB	25 mph	30 mph
Midtown Bridge	NB and SB	25 mph	30 mph

2.6 Vertical and Horizontal Alignment

The existing horizontal alignment and criteria information is summarized in **Table 2-5**.

Table 2-5. Existing Horizontal Alignment and Criteria

Existing					Criteria				
Curve Name	PC	PT	Degree of Curvature	Radius (ft)	FDOT Min. Radius e =10%	FDOT Min. Curve Length (ft)	AASHTO Min. Curve Length (ft)	Existing Variation (V)/ Exception (E)	Curve Length (ft)
SW 17th Street	32+10.92	38+25.71	19°5'55"	300	223	400	N/A	None	614.79

SW 17th Street information was obtained from As-built Plans for “One Plantation Place” site development plans.

There is no existing horizontal or vertical curve on SR-84 and there is no existing vertical curve on SW 17th Street within the limits of the project.

2.7 Pedestrian Accommodations

The existing pedestrian facilities within the study area are summarized in **Table 2-6**.

Table 2-6. Existing Pedestrian Facilities

Roadway	Existing Pedestrian Facilities	Comment
Midtown Bridge	None	<ul style="list-style-type: none"> Prohibited because of the connection to the Limited Access facility.
SW 17 Street	Yes	<ul style="list-style-type: none"> 4' sidewalks on the north side of the road 12' Trail on south side.
SR 84	None	<ul style="list-style-type: none"> Prohibited within Limited Access.
University Dr.	Yes, Partial	<ul style="list-style-type: none"> Sidewalk on both sides of the roadway from Peters Road going south. EB sidewalk ends just before the bridge just south of I-595. WB sidewalk ends at SW 13th Place.
Peters Road	Yes	<ul style="list-style-type: none"> Sidewalk on both sides of the road from University Dr. to South Pine Island Road.
S Pine Island	Yes	<ul style="list-style-type: none"> Sidewalk on both sides of the roadway from Peters Road to just before the bridge to SR 84.
University Dr. at SR 84 (EB approach)	Yes, partial	<ul style="list-style-type: none"> Sidewalk only on the east side of the road.
SW 78th AVE	Yes, partial	<ul style="list-style-type: none"> Sidewalk along west side of roadway up to SW 13th Place. South of 13th Place, sidewalk on both sides of the roadway.
SW 13th Pl	Yes	<ul style="list-style-type: none"> Sidewalk on both sides of the road.

2.8 Bicycle Facilities

The existing bicycle facilities within the study area are summarized in **Table 2-7**.

Table 2-7. Existing Bicycle Facilities

Roadway	Existing Bicycle Facilities	Comment
Midtown Bridge	None	<ul style="list-style-type: none"> Prohibited within Limited Access.

SW 17 Street	Partial	<ul style="list-style-type: none"> The New River Greenway Trail is on the south side
SR 84	None	<ul style="list-style-type: none"> Prohibited within Limited Access.
University Dr.	Yes	<ul style="list-style-type: none"> 5' Bicycle Lane on both sides of the roadway
Peters Road	Yes	<ul style="list-style-type: none"> 5' Bicycle Lane on both sides of the roadway
S Pine Island	Yes	<ul style="list-style-type: none"> 5' Bicycle Lane on both sides of the roadway
University Dr. at SR 84 (EB approach)	Yes	<ul style="list-style-type: none"> 5' Bicycle Lane on the East side of the roadway
SW 78th AVE	None	<ul style="list-style-type: none"> No bike lanes on either side of the roadway
SW 13th Pl	None	<ul style="list-style-type: none"> No bike lanes on either side of the roadway

2.9 Transit Facilities

Broward County Transit (BCT) provides fixed route bus, express and community shuttles and paratransit – door-to-door – services in Broward County. BCT’s mission is to provide safe and reliable transportation solutions that link people, connect communities, support employment and contribute to the overall economic growth of our region.

BCT provides links to Miami-Dade and Palm Beach county transit systems, and to Tri-Rail (commuter rail service). Fixed routes provide connections to the City of Plantation’s multimodal transportation network, as well as system-wide connections at four transfer terminals: Broward Central Terminal (downtown Fort Lauderdale), West Regional Terminal (Plantation), Lauderhill Transit Center (Lauderhill) and Northeast Transit Center (Pompano Beach).

Existing transit located within the study area is provided by **Broward County Transit**. Three (3) Bus Routes, the 2, 12, and 30 are within the study area as shown on **Figure 2-5** below with stops on Peters Road and University Drive.



Figure 2-5. Broward County Transit System Map for the Surrounding Study Area

The FDOT I-595 Express Bus Park and Ride Lot service is provided by BCT to operate in the I-595 Reversible Lanes and the I-95 Managed Lanes. The service currently does not provide for a park-and-ride lot or stop in the Midtown Business District. Once the bridge is constructed, the City of Plantation could explore opportunities for a service connection to the District, providing connections for residents and the Midtown businesses with express service to the City of Sunrise, TriRail and Downtown Miami. **Figure 2-6** shows the I-595 Express Bus Route through Central Broward County.

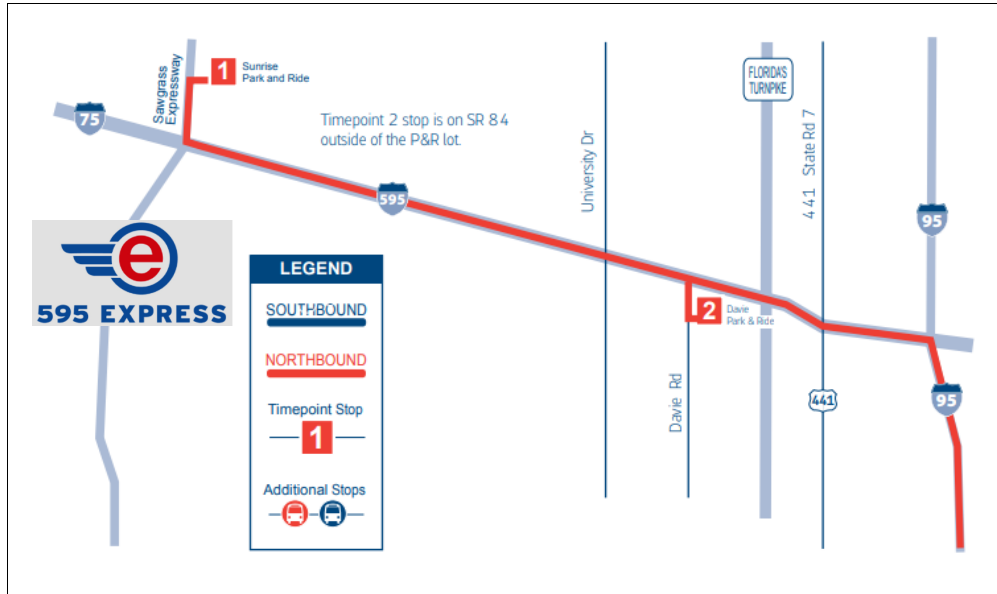


Figure 2-6. I-595 Express Bus Route Currently Passes By the Midtown Business District

The Town of Davie local community shuttle “Blue Route” drives through the study area, providing connections to operate approximately every 70 minutes for the first three trips in the morning and a 45 minute headway for the remaining daily service. The route serves the University Drive corridor through the study area.

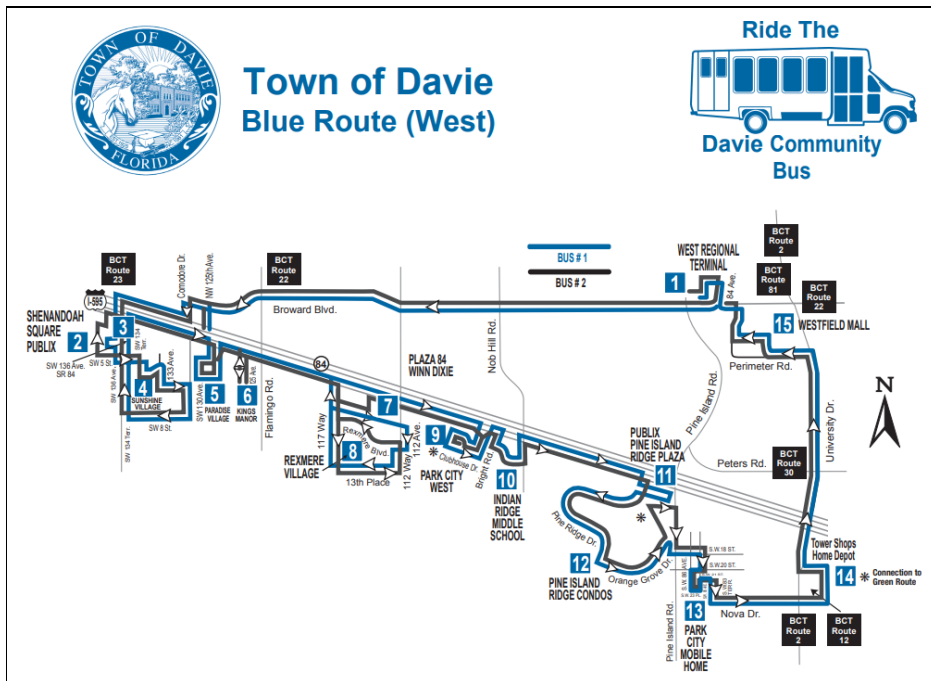


Figure 2-7. Davie Blue Route Provides Connections from University Drive to Local Attractions

2.10 Pavement Condition

The as-built plans for FDOT project 420808-3-52-01/ SR-862 (I-595), SR-84 shows the following existing pavement layers:

- Optional base group 9 with
- 3” of Type SP structural course
- and 1” of FC-9.5 friction course

The inside and outside shoulder pavement show the following existing layers:

- Optional base group 1 with
- 1.5” of Type SP structural course
- and 1” of FC-9.5 friction course

The pavement along SW 17th Street was at the time of preparation of this document was considered as fair to poor condition. No as-built information was found for the SW 17th Street to verify the existing pavement layers.

Table 2-8. Existing Pavement Condition

Location	Overall Pavement Condition	Existing Structural Course Thickness
SR-84	Good to Fair	Approximate Average = 4”*
SW 17th Street	Fair to Poor	Unknown

*The FDOT Flexible Pavement Design Manual requires a minimum structural course thickness of 4” on limited access facilities.

2.11 Traffic Volumes and Operational Conditions

2.11.1 Traffic Volumes

Multiple count sources were used to develop the 2021 daily counts as shown on **Table 2-9**. All the available 2019 rounded AADTs are from the *Arterial Connectivity Study (ACS) along I-595 Corridor* report, which used traffic count data collected along I-595, the *SR817/University Drive Corridor Analysis Study*, and 2019 Synopsis Report. The ACS report detailed the data collection efforts and adjustment methodology used to develop the 2019 AADT. The same growth factors in the ACS study report were applied to convert the 2019 rounded AADT to 2021 rounded AADT.

Three additional turning movement counts at Peter's Road and SW 78th Avenue, SW 78th Avenue and SW 13th Place, and University Drive and SW 13th Place were collected on 08/24/2021 from 7 AM -7 PM. Twenty (24)-hour daily counts were also collected around the same time using videos for the segments close to the three intersections. The seasonal factor (SF) was applied to adjust the counts to directional

AADTs using the same SF as was used for Peters Road in the ACS report.

Table 2-9. 2021 Daily Counts

Study Corridor	Intersection	Location	Historical Trend Analysis (2015-2019)*	Historical Trend Analysis (2009-2019)	Volume Growth Rate from ACS Report	Volume Growth Rate from this study	Difference	Population Growth Rate	Employment Growth Rate	Recommended Growth Rate (From ACS Study)	Recommended Growth Rate From This Study
Pine Island Road	SR 84 Westbound	Pine Island Road North of SR 84 Westbound	1.6%	0.7%	0.4%	0.5%	-0.1%	0.6%	1.0%	1.0%	1.0%
		SR 84 Westbound East of Pine Island Road	1.3%	0.3%	0.8%	0.9%	-0.1%	5.7%	1.0%	1.2%	1.2%
		SR 84 Westbound West of Pine Island Road	2.6%	1.1%	0.6%	0.5%	0.3%	0.2%	1.0%	1.0%	1.0%
	SR 84 Eastbound	SR 84 Eastbound East of Pine Island Road	3.5%	2.6%	1.0%	1.1%	-0.1%	0.2%	1.0%	1.2%	1.2%
		Pine Island Road South of SR 84 Eastbound	4.9%	2.0%	0.4%	0.4%	0.0%	0.2%	1.0%	0.8%	0.8%
		SR 84 Eastbound West of Pine Island Road	-5.3%	0.9%	0.6%	0.7%	-0.1%	0.2%	1.0%	1.0%	1.0%
	Peters Road	Pine Island Road North of Peters Road	-1.6%	-0.9%	0.5%	0.5%	0.0%	154.7%	1.0%	1.0%	1.0%
		Peters Road East of Pine Island Road	-2.0%	-0.7%	1.1%	1.1%	0.0%	14.0%	1.0%	1.0%	1.0%
		Pine Island Road South of Peters Road	1.6%	0.7%	0.4%	0.5%	-0.1%	5.7%	1.0%	1.0%	1.0%
		Peters Road West of University Drive	-2.0%	-0.7%	1.2%	1.1%	0.1%	14.0%	1.0%	1.2%	1.2%
University Drive	Peters Road	University Drive North of Peters Road	2.0%	-0.3%	0.2%	0.2%	0.0%	2.4%	1.0%	1.2%	1.2%
		Peters Road East of University Drive	2.0%	3.2%	1.2%	1.3%	-0.1%	0.0%	1.0%	1.2%	1.2%
		University Drive South of Peters Road	2.2%	1.5%	0.4%	0.4%	0.0%	1.1%	1.0%	1.2%	1.2%
		Peters Road West of University Drive	-2.0%	-0.7%	1.2%	1.1%	0.1%	14.0%	1.0%	1.2%	1.2%
	SW 13th PI	SW 13th PI West of University Drive						5.7%	1.0%		1.0%
		University Drive North of SW 13th PI	2.2%	1.5%	0.4%	0.4%	0.0%	1.1%	1.0%		1.0%
		University Drive South of SW 13th PI	2.2%	1.5%	0.4%	0.4%	0.0%	1.1%	1.0%		1.0%
	SR 84 Westbound	University Drive North of SR 84 Westbound	2.2%	1.5%	0.4%	0.4%	0.0%	1.1%	1.0%	1.2%	1.2%
		SR 84 Westbound East of University Drive	12.0%	-2.8%	1.2%	1.2%	0.0%	0.0%	1.0%	1.2%	1.2%
		SR 84 Westbound West of University Drive	1.3%	0.3%	1.3%	1.3%	0.0%	5.7%	1.0%	1.2%	1.2%
SR 84 Eastbound East of University Drive		5.4%	0.9%	1.9%	2.2%	-0.3%	2.7%	1.0%	1.2%	1.2%	
SR 84 Eastbound	University Drive South of SR 84 Eastbound	-1.5%	-1.2%	0.4%	0.4%	0.0%	1.4%	1.0%	1.0%	1.0%	
	SR 84 Eastbound West of University Drive	1.9%	-1.3%	0.4%	0.7%	-0.3%	0.3%	1.0%	1.2%	1.2%	
	SW 80th Terrace North of Peters Road						154.7%	1.0%	1.2%	1.2%	
SW 80th Terrace	Peters Road						14.0%	1.0%	1.2%	1.2%	
	Peters Road East of SW 80th Terrace	-2.0%	-0.7%	1.2%	1.1%	0.1%	14.0%	1.0%	1.2%	1.2%	
	Peters Road West of SW 80th Terrace	-2.0%	-0.7%	1.1%	1.1%	0.0%	14.0%	1.0%	1.0%	1.0%	
SW 78th Ave	SW 13th PI	SW 13th PI East of SW 78th Ave					5.7%	1.0%		1.0%	
		SW 78th Ave North of SW 13th PI					5.7%	1.0%		1.0%	
		SW 78th Ave South of SW 13th PI					5.7%	1.0%		1.0%	
	Peters Road	SW 78th Ave South of Peters Road					5.7%	1.0%		1.0%	
		Peters Road West of SW 78th Ave	-2.0%	-0.7%	1.2%	1.1%	0.1%	14.0%	1.0%	1.2%	1.2%
SW 17th Street	Midtown Bridge	Peters Road East of SW 78th Ave	-2.0%	-0.7%	1.2%	1.1%	0.1%	14.0%	1.0%	1.2%	1.2%
		Aetna North of SW 17th Street						5.7%	1.0%		1.0%
		SW 17th Street West of Midtown Bridge						5.7%	1.0%		1.0%
		SW 17th Street East of Midtown Bridge						5.7%	1.0%		1.0%
		Midtown Bridge South of SW 17th Street					5.7%	1.0%		1.0%	

NOTE: * 2019 Historical trend analysis is from ACS report
 2021 Historical trend analysis AADT sites can be found in Appendix

Existing year 2021 peak hour volumes were developed for the entire study area by following approved processes and techniques consistent with the latest version of the 2019 FDOT’s Project Traffic Forecasting Handbook. The peak season hourly volumes for the study area along with the complete analysis is found in the Draft Traffic Analysis Report, March 2022 located in **Appendix B**.

Table 2-10. Existing AADT

Study Corridor	Intersection	Location	2019 Rounded AADT	Growth Factor *	2021 AADT	2021 Rounded AADT
Pine Island Road	SR 84 Westbound	Pine Island Road North of SR 84 Westbound	52,000	1.0201	53,045	53,000
		SR 84 Westbound East of Pine Island Road	23,500	1.0201	23,972	24,000
		SR 84 Westbound West of Pine Island Road	22,500	1.0201	22,952	23,000
	SR 84 Eastbound	SR 84 Eastbound East of Pine Island Road	21,500	1.0201	21,932	22,000
		Pine Island Road South of SR 84 Eastbound	42,000	1.0201	42,844	43,000
		SR 84 Eastbound West of Pine Island Road	23,500	1.0201	23,972	24,000
	Peters Road	Pine Island Road North of Peters Road	53,000	1.0201	54,065	54,000
		Peters Road East of Pine Island Road	18,000	1.0201	18,362	18,500
		Pine Island Road South of Peters Road	51,500	1.0201	52,535	52,500
University Drive	Peters Road	University Drive North of Peters Road	65,000	1.0241	66,569	66,500
		Peters Road East of University Drive	29,500	1.0241	30,212	30,000
		University Drive South of Peters Road	81,500	1.0241	83,468	83,500
		Peters Road West of University Drive	23,000	1.0241	23,555	23,500
	SW 13th PI	SW 13th PI West of University Drive			3,725	3,700
		University Drive North of SW 13th PI			64,256	64,500
		University Drive South of SW 13th PI			72,134	72,000
	SR 84 Westbound	University Drive North of SR 84 Westbound	78,500	1.0241	80,395	80,500
		SR 84 Westbound East of University Drive	31,000	1.0241	31,748	31,500
		SR 84 Westbound West of University Drive	23,500	1.0241	24,067	24,000
		SR 84 Eastbound East of University Drive	21,500	1.0241	22,019	22,000
	SR 84 Eastbound	University Drive South of SR 84 Eastbound	62,000	1.0241	63,497	63,500
SR 84 Eastbound West of University Drive		20,000	1.0241	20,483	20,500	
SW 80th Terrace	Peters Road	SW 80th Terrace North of Peters Road	4,100	1.0241	4,199	4,200
		Peters Road East of SW 80th Terrace	22,500	1.0241	23,043	23,000
		SW 80th Terrace South of Peters Road	1,600	1.0241	1,639	1,600
		Peters Road West of SW 80th Terrace	18,000	1.0241	18,435	18,500
SW 78th Ave	SW 13th PI	SW 13th PI East of SW 78th Ave			3,725	3,700
		SW 78th Ave North of SW 13th PI			3,100	3,100
		SW 78th Ave South of SW 13th PI			1,811	1,800
	Peters Road	SW 78th Ave South of Peters Road			3,100	3,100
		Peters Road West of SW 78th Ave	23,500	1.0201	23,972	24,000
Peters Road East of SW 78th Ave	23,500	1.0201	23,972	24,000		
SW 17th Street	Midtown Bridge	SW 17th Street West of Midtown Bridge			192	200
		SW 17th Street East of Midtown Bridge			192	200
		Midtown Bridge South of SW 17th Street			n/a	n/a

NOTE: * This study uses the same the growth factors from ACS report

2.11.2 Operational Conditions

The traffic operations analysis for the existing Turnpike freeway segments and ramps are based on Highway Capacity Manual (HCM) Edition 7 methodologies. Highway Capacity Software was used to analyze the mainline segments and ramp merge/diverge areas. The Level of Service (LOS) was determined directionally for the highway segments within the study area. Intersections were analyzed based on Synchro control delay. The existing AM and PM peak hour traffic was evaluated in each direction for the freeway segment analysis. The FDOT minimum desired requirements for urban facilities is LOS D. The Roadway LOS results are shown in **Table 2-11**.

Table 2-11. Existing (2021) Roadway Analysis

Roadway	Approach	AM		PM	
		Travel Time (sec)	Arterial LOS	Travel Time (sec)	Arterial LOS
Peters Rd	EB	162.7	D	193.1	E
	WB	245.4	E	270.8	E
Pine Island Road	NB	207.8	E	206.5	E
	SB	226.2	E	220.0	E
SR 84	EB	168.7	F	197.9	F
	WB	516.9	F	609.9	F
University Drive	NB	174.9	E	231.4	F
	SB	205.4	F	185.3	F

As shown in the table, all of the following study roadways and their approaches do not meet the total roadway LOS target of D in the AM and/or PM peak hours.

AM and PM peak hour intersection analyses were performed for the study area intersections for the existing balanced peak hour volumes shown in **Appendix B**. As shown in the table, the majority of the intersections do not meet the overall intersection minimum LOS standard of D during the peak hours.

Table 2-12. Existing (2021) Intersection Analysis

Intersection	AM Peak Hour		PM Peak Hour	
	Approach LOS	Approach Delay (sec/veh)	Approach LOS	Approach Delay (sec/veh)
University Drive at Peters Road	F	82.0	F	116.6
University Drive at SR 84 (WB)	F	83.0	E	78.1
University Drive at SR 84 (EB)	E	56.1	E	67.5
Peters Road at SW 80th Terrace	A	9.7	D	45.5
Pine Island Road at Peters Road	C	34.1	D	42.2
Pine Island Road at SR 84 (WB)	F	111.0	F	179.7
Pine Island Road at SR 84 (EB)	E	78.9	E	68.8
Peters Road at SW 78th Avenue	B	14.2	F	241.4
University Drive at SW 13th Place	E	38.0	D	26.8
SW 78th Avenue at SW 13th Place	A	5.4	A	6.4

Additional traffic information for the project study area can be found in the Traffic Analysis Report..

2.12 Intersections

The intersections within the project study area are noted in **Table 2-13**.

Table 2-13. Existing Intersections

Intersection Name	Signalized (Y/N)
University Drive at Peters Road	Y
University Drive at SR 84 (WB)	Y
University Drive at SR 84 (EB)	Y
Peters Road at SW 80th Terrace	Y
Pine Island Road at Peters Road	Y
Pine Island Road at SR 84 (WB)	Y
Pine Island Road at SR 84 (EB)	Y
Peters Road at SW 78th Avenue	N
University Drive at SW 13th Place	N
SW 78th Avenue at SW 13th Place	N

2.13 Railroad Crossings

There are no railroad crossings within the project study area.

2.14 Crash Data and Safety Analysis

Crash data was collected for the five-year period from 2016-2020 and crash analyses were conducted to identify crash patterns and contributing causes within the study limits. Per coordination with FDOT D4, it was recommended that crash data be collected for the period 2016 to 2018 from the CAR system on the state road, SR 817/University Drive since CARs data was not available 2 years prior to the start of this study in 2021. The S4A database was used to collect data on the local roads – Peters Road and Pine

Island Road – for the period 2019 to 2020. The analyses for the study segments are summarized below. Details are included in the Traffic Analysis Report.

2.14.1 Crash Data

Based on the crash analysis that was conducted, a total of 827 crashes occurred on University Drive from Peters Road to SR 84. The total number of crashes has fluctuated yearly with an increasing trend. A majority of the crashes were rear-ended (62.9%); the next top two crash types were angle (14.1%) and sideswipe (11.5%) crashes, probably due to lane changing and merging at the on-ramp. Two (2) fatalities occurred during the reporting period; however, none occurred last year. A majority of the crashes were labeled as Property Damage Only (PDO) (74.5%), while most occurred during clear daylight (79.1%) conditions. Despite the general adverse weather conditions in Florida, there were only a few wet pavement condition (15.1%) crashes recorded. Almost a quarter of the crashes were recorded during the peak hour from 3:00-6:00 PM (23.9%). **Figure 2-8** shows the crash statistics by year for University Drive.

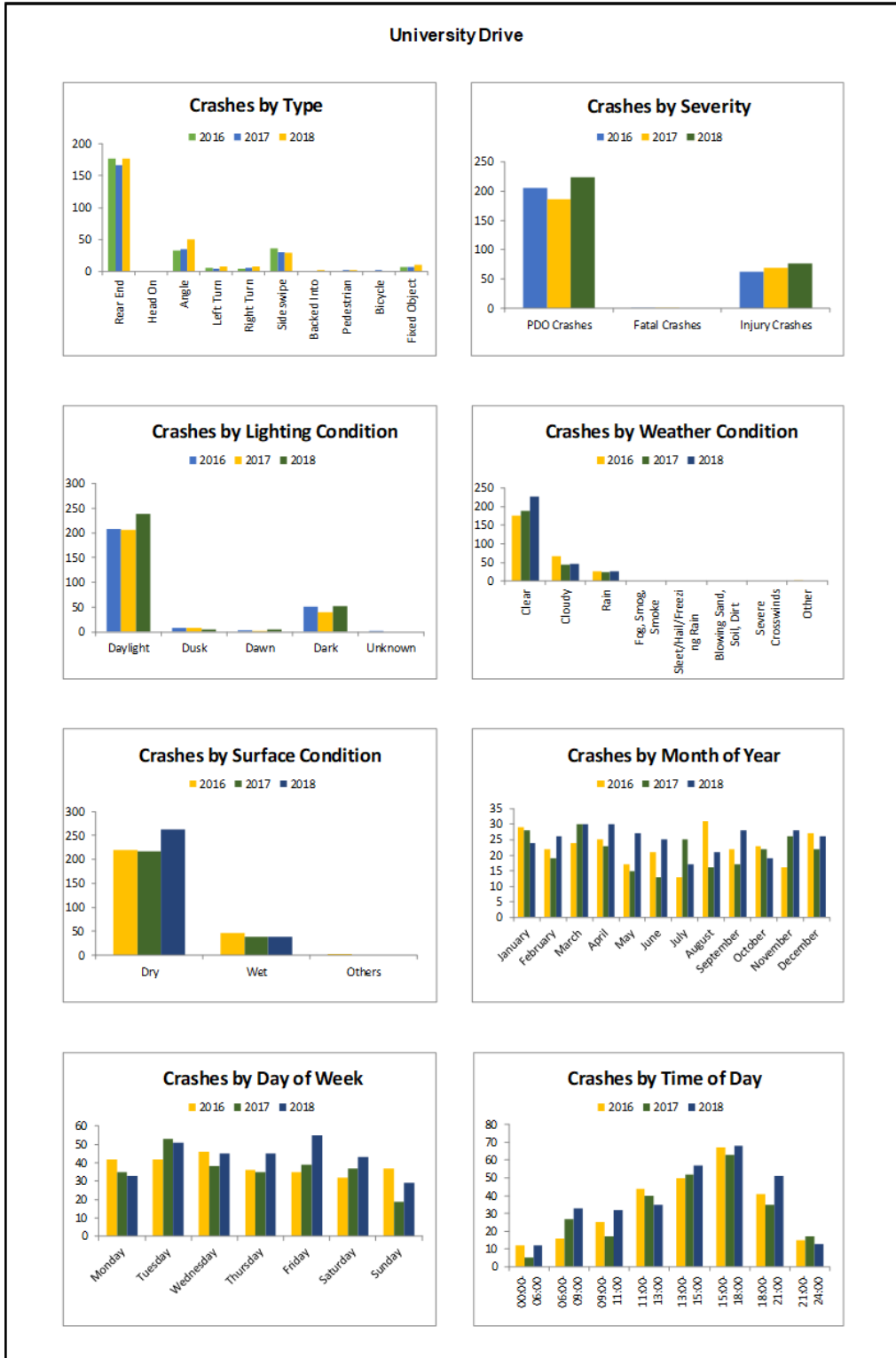


Figure 2-8. University Drive Crash Data

A total of 112 crashes were recorded over the two-year period on Pine Island Road from Peters Road to SR 84. Almost three-quarters of all crashes consisted of Rear-end and sideswipe crashes, with rear-end crashes as the most predominant crash type (50.9%). Following rear-end crashes, more sideswipes may have occurred due to lane changing and distraction while driving. No fatalities were observed, and 80% of the crashes consisted of Property Damage Only (PDO). About a third of the crashes occurred during the peak period between 3 and 6 PM (30.4%). **Figure 2-9** shows the crash statistics by year for Pine Island Road.



Figure 2-9. Pine Island Crash Data

There were a total of 77 crashes on Peters Road from University Drive to Pine Island. A high number of rear-end (29.9%) and left turn (18.2%) crashes were observed, likely due to the curved configuration of the roadway. No fatalities were observed, however most of the crashes were labeled as Property Damage Only (PDO) (79.2%) that occurred during clear daylight (87.0%) condition. There were only a few wet pavement condition (13%) crashes recorded. Almost half of all crashes occurred during the peak from 3:00-6:00 PM (49.4%). **Figure X** shows the crash statistics by year for Peters Road.

2.14.2 Crash Mitigation

Since there are no real physical improvements on the State and Local Roads with the construction of the Bridge, Crash Reduction Factors (CRFs)/Crash Modification Factor (CMFs) are not applicable for this study. Instead, Predictive Methods were utilized to estimate the expected crashes after alleviating the traffic caused by the proposed improvement on the State and Local Roads. As per the analysis, the expected annual average crash frequency would be 205 crashes for the entire study area as shown in **Table 2-14**. The expected average crash frequency is lower than the observed crashes (present crash data 370) shows that there is a potential 45% reduction in crashes with the proposed improvement on the state and local Roads in the study area.

Table 2-14. EB Method - Predicted Crash Frequency

Worksheet 3A -- Predicted Crashes by Severity and Site Type and Observed Crashes Using the Site-Specific EB Method for Urban and Suburban Arterials							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Collision type/ Site type	Predicted average crash frequency (crashes/year)			Observed crashes, $N_{observed}$ (crashes/year)	Overdispersion Parameter, k	Weighted adjustment, w Equation A-5 from Part C Appendix	Expected average crash Equation A-4 from Part C
	$N_{predicted}$ (TOTAL)	$N_{predicted}$ (FI)	$N_{predicted}$ (PDO)				
ROADWAY SEGMENTS							
Multiple-vehicle nondriveway							
Peters Road	8.058	2.390	5.669	39	1.320	0.086	35.884
University Drive	2.257	0.588	1.669	276	1.980	0.502	138.342
Pine Island Road	2.217	0.618	1.599	56	1.980	0.508	28.664
Single-vehicle							
Peters Road	3.470	0.513	2.957	0.000	0.860	0.251	0.871
University Drive	0.197	0.040	0.157	0.000	1.290	1.348	0.177
Pine Island Road	0.444	0.076	0.367	0.000	1.290	1.196	0.354
Multiple-vehicle driveway-related							
Peters Road	1.409	0.400	1.009	0.000	1.390	0.338	0.476
University Drive	0.065	0.019	0.047	0.000	2.085	1.414	0.062
Pine Island Road	0.246	0.070	0.176	0.000	2.085	1.221	0.201
Segment Totals:	18.364	4.714	13.649	370.170			205.030

The proposed bridge may indirectly reduce crashes on University Road, specifically for southbound traffic by reducing instances of tailgating and providing more adequate gaps during the peak hours. This can potentially prevent rear-end and sideswipe crashes during the traffic congestion periods. Overall, the

proposed bridge connector is anticipated to improve safety through less traffic interaction and more mobility on the adjacent roadways.

2.15 Drainage

The project is within the jurisdiction of the South Florida Water Management District (SFWMD) and Broward County Water Control District

Basin 1 - The existing drainage system in SW 17th Street is located on both sides of the road. The road has a valley gutter on both sides sloping east and west from the intersection of the proposed bridge location on SW 17th street. The proposed intersection location is a high point on the existing road. The existing inlets are located around 370' to the East and 220' to the West from the proposed bridge intersection location. However, the connectivity of existing inlets, existing drainage treatment system, and attenuation process is unknown.

Basin 2- The existing drainage system in SR 84 is located on the north side (Canalside) of the road. The existing drainage system consists of inlets and pipes running along the concrete barrier wall. The inlets are used to collect the runoff from the road and convey the runoff through a pipe towards the west and then the pipe turns to the south and ultimately discharges to Arrowhead Golf Course. The runoff is treated and attenuated in the wet detention pond of the Arrowhead Golf Course and finally discharges back to the North New River Canal.

2.16 Soils and Geotechnical Data

The information provided is based on research of the U.S. Department of Agriculture (USDA), Soil Conservation Service (SCS) Soil Survey of the Broward County area, which indicates the presence of following different soil map units along the roadway/bridge sections.

This information indicates that there are 3 soil mapping units. The map soil units encountered are as follows:

In Broward County:

- Immokalee fine sand
- Pompano fine sand
- Udorthents

The most encountered soil is Udorthents, which is characterized by somewhat well drained soil. The soil map units present along the project corridor are described in Appendix – A.

A description of the general profile of the existing soils, within the study limits, was determined by available existing borings previously performed at other projects proximate to the study limits. Soils and soil profiles found in the available borings drilled for the roadway alignment study generally consisted of four (4) general types.

- **Strata 1** – Light brown to brown Sand with Limerock fragments, with silt to silty

(A-3/A-2-4/A-1-b).

- **Strata 2** – Light brown to brown Sand with silt, sometimes with organic stain, sometimes with some Limerock fragments (A-3).
- **Strata 3** – Light brown to brown Sand, slightly silty to silty, sometimes with some Limerock fragments and scattered organic stain (A-2-4/A-4).
- **Strata 4** – Brown sandy to silty Limestone.

Based on available existing information, it indicates the subsoils are sand or silty sands interlayering with limerock fragments from ground surface to elevation approximately -40 feet NAVD, followed by Limestone to the termination depths of exploration.

The groundwater table elevations in the available existing borings reviewed, varied from +0.0 feet NAVD to +3.0 feet NAVD. The groundwater levels along the project corridor are largely influenced by the stage levels of North New River Canal, which runs along the project corridor. The canal water information is included in Appendix B.

2.17 Utilities

A list of the existing Utility Agencies/Owners (UAOs) was obtained by contacting Sunshine 811. A field review was also conducted to further identify any designated existing facilities in the project corridor. All the UAOs identified in the field were also noted on the Sunshine 811 list. The existing UAOs, the UAO contacts and facility type are summarized in **Table 2-15**.

Table 2-15. Existing Utilities

Utility Agency Owner	Contact	Utility Type
AT&T Florida 9101 Coral Way Miami, FL 33165	Steve Hamer 813- 888- 8300 x201	Communications
Broward County Traffic Engineering 2300 West Commercial Blvd. Ft. Lauderdale, FL 33309	Robert Blount 954-847-2745	Traffic Control
Comcast Cable 2601 Southwest 145th Ave. Suite 100 Miramar, FL 330	Ricardo Davison 786-586-8505	CATV & Fiber
City of Plantation Utilities 709 N. Homestead Blvd. Homestead, FL 33030	Danny Pollio 954-797-2209	Sewer & Water
FDOT/ Eland Engineering 3400 Commercial Blvd. Ft.	Chris Beaudry 954-847-1996	Electric Fiber

Lauderdale, FL 33309		
FP&L - Broward 7200 NW 4th Street. Ft. Lauderdale, FL 33317	Joel Bray 386-586-6403	Electric
Hotwire Communications 10360 USA Today Way, Miramar, FL 33025	Walter Davila 954-699-0900	CATV, Fiber, Telephone
I 595 Express LLC Electric 10368 SR-84, Suite 202. Davie, FL 33324	Diana Maldonado 954-513-3200 x8027	Electric & Fiber
MCI 2400 N Glenville, Richardson, TX 75082	National Fiber Security Department 800-624-9675	Communication & Fiber
Teco Peoples Gas 5101 NW 21st Ave. Ste. 460 Ft. Lauderdale, FL 33309	Joan Doning 813-275-3783	Gas
AT&T Distribution 2021 South Military Trail Plantation, FL 33322	Dino Farrugio 561-683-2729	Telephone
City of Sunrise Water & Wastewater Department 777 Sawgrass Corporate Parkway, Sunrise, FL 33325	John Zarzycki 954-888-6069	Water & Wastewater
City of Sunrise Gas 4401 NW 103 Ave. Sunrise, FL 33351	Marcus Louis 954-572-2231	Gas
Town of Davie Utilities 6591 Orange Drive Davie, FL 33314	Larry Doughty 954-327-3744	Water & Sewer

2.18 Lighting

The existing lighting within the study area is summarized in the table below.

Table 2-16. Existing Lighting

Location	High Mast Lighting	Comments
SW 17 Street	None	Conventional; on south side, spaced approx 200' apart
SR 84/ I 595	None	Conventional; on the north side, attached to the retaining wall, spaced approx 150' apart

2.19 Signing and ITS

A sign inventory was conducted in January 2022. There is one speed limit sign on SR 84 in the vicinity of the project limits and an existing stop sign on the driveway approaching SW 17 Street.

There are no ITS facilities within the limits of this project.

2.20 Aesthetic Features

Aesthetic elements in the project area consist of the SR 84/ I-595 planted buffer areas separating the I-595 ramp to SR 84. There are also trees and landscaping along SW 17 Street. The majority of site is existing turf with a few clusters of palms and some shade trees.

2.21 Bridges and Structures

The existing bulkhead wall extending along the South approach of SR-84 is comprised of steel sheet piles and a concrete cap. The bulkhead concrete cap is uniform in width along its length, with the exception of Light Pole Pilaster locations, where the width is adjusted accordingly. Note that there are no light poles located within the proposed site. Above and behind the bulkhead's cap, is a concrete traffic railing extending along SR-84.

2.22 Toll Features

There are no Toll Features within the Study Area.

2.23 Outdoor Advertising

There are no Outdoor advertising Signs within the limits of the project.

2.24 Environmental Features

Environmental supporting documents prepared for this study are summarized by topic in the sections that follow.

2.24.1 Section 4(f) and 6(f)

There are no existing Section 4(f) or Section 6(f) properties within the project limits

2.24.2 Cultural Resources

A Cultural Resource Assessment Survey (CRAS) was performed to locate and evaluate archaeological and historic resources within the Area of Potential Effect (APE) and to assess their eligibility for inclusion in the National Register of Historic Places (National Register) according to the criteria set forth in 36 CFR Section 60.4. In order to comply with federal and state regulations, a CRAS is conducted to identify all historic and archaeological resources that may be affected by the project improvements. The CRAS is a major task required as part of the Section 106 process. An APE must be established in order to determine the physical area in which cultural resources will be identified. For this CRAS, the APE was determined by considering the type of improvements being proposed and the potential effects these improvements could have on cultural resources. The APE determination also considered the urbanized character of the project corridor. The archaeological APE focuses upon identifying and evaluating resources within the geographic limits of the proposed action and its associated ground disturbing activities. Therefore, the archaeological APE consisted of the footprint of the proposed subsurface improvements for all alternatives **Figure 2-10**. The current APE for historic resources includes an area within 150 feet of the improvements for the proposed alternatives. The elevated I-595 facility serves as the southern boundary of the historic resources APE, as it provides a visual barrier from the project area. The APE was judged to be sufficient based on the nature of the improvements and the highly developed nature of the corridor. **Figure 2-10** below shows the historic APE for this project on an aerial map.

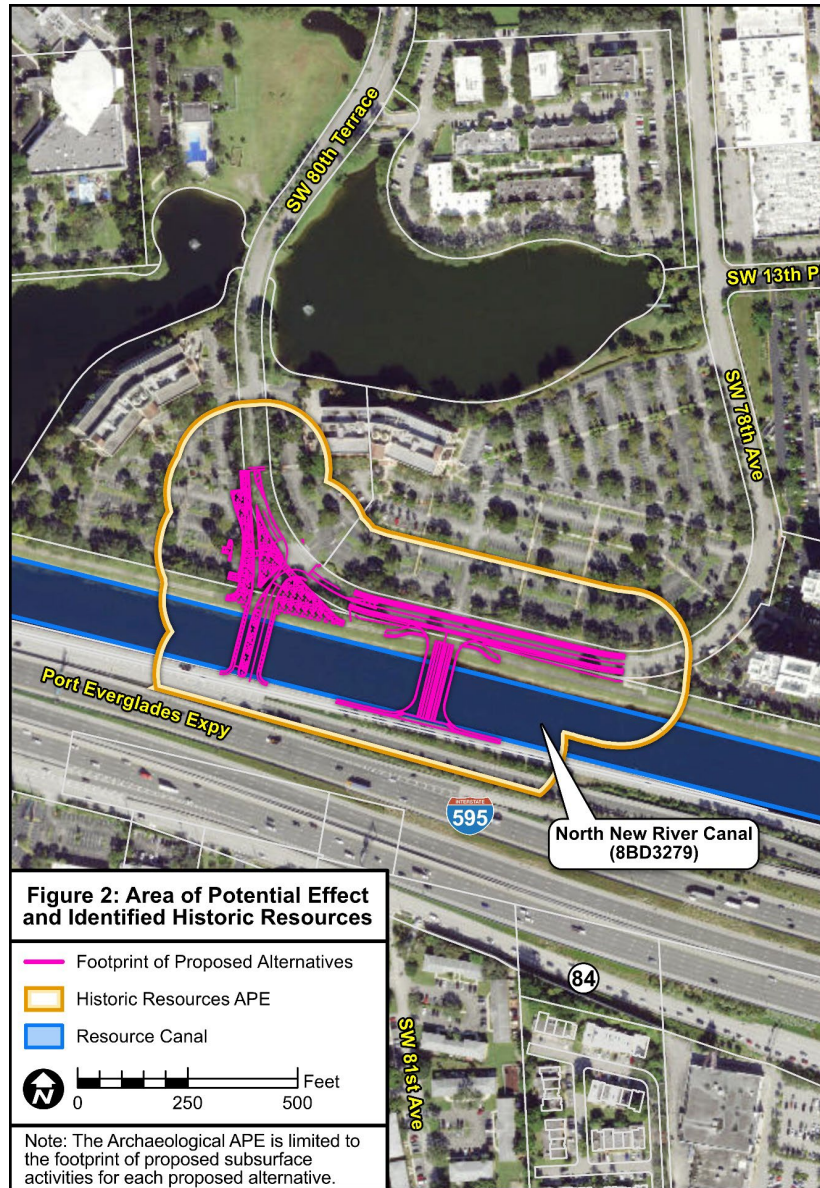


Figure 2-10. Area of Potential Effect and Identified Historic Resources

2.24.3 Wetlands

Pursuant to Executive Order 11990 entitled “Protection of Wetlands,” (May 1977) the U.S. Department of Transportation (USDOT) has developed a policy, Preservation of the Nation’s Wetlands (USDOT Order 5660.1A), dated August 24, 1978, which requires all federally-funded highway projects to protect wetlands to the fullest extent possible. In accordance with this policy, as well as Part 2, Chapter 9 – Wetlands and Other Surface Waters of the FDOT PD&E Manual, project alternatives were assessed to determine potential wetland impacts associated with the construction of each alternative.

One surface water feature (New River Canal) has been identified and mapped within the alternative

bridge alignment footprint. A description of the dominant floral species, soil types, Florida Land Use, Cover and Forms Classification System (FLUCFCS) codes, and other pertinent remarks are contained in the following sections. There are approximately 0.3 acre of other surface waters within alternative alignment footprints.

Both alternative bridge alignments could result in minimal impacts to a man-made canal. Impacts to man-made surface water features will not likely require mitigation.

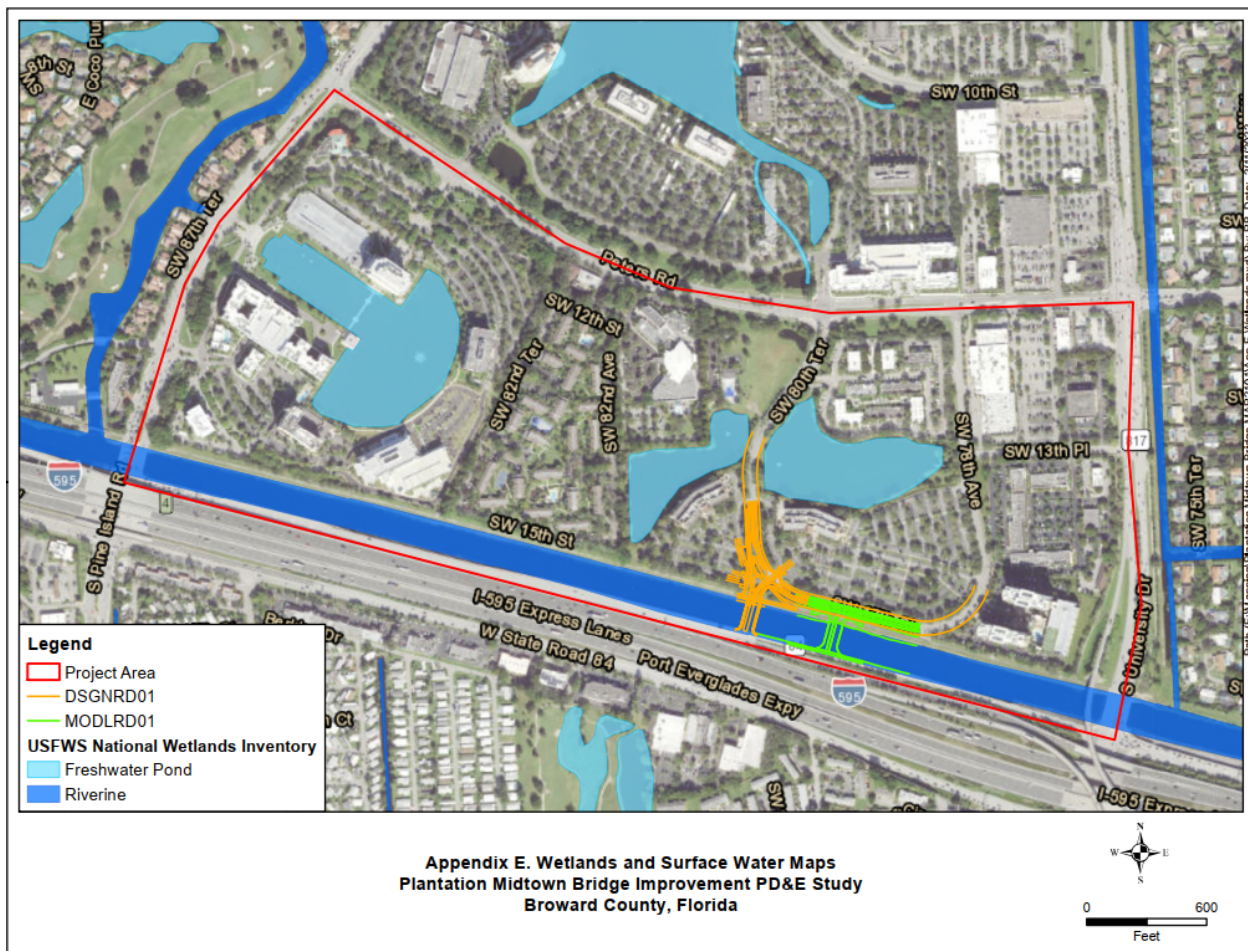


Figure 2-11. Wetlands and Surface Water Map

2.24.4 Protected Species and Habitat

The area containing alternative bridge alignment footprints was assessed for the presence of suitable habitat for federal- and/or state listed protected species in accordance with 50 Code of Federal Regulation (CFR) Part 402 of the ESA of 1973, as amended, Chapters 5B-40 and 68A-27 F.A.C., and Part 2, Chapter 16 – Protected Species and Habitat of the FDOT PD&E Manual. Literature reviews, agency database searches, and preliminary field reviews (February 2022) of potential habitat areas were conducted to identify state and federally protected species occurring or potentially occurring within the

study area. The Broward County Soil Surveys and recent aerial photographs were reviewed to determine habitat types occurring within and adjacent to the project action area. Information sources and databases utilized include the following:

- USFWS Databases
- Florida Fish and Wildlife Conservation Commission (FWC) Databases
- Florida Natural Areas Inventory (FNAI)
- Broward County Soil Survey
- Atlas of Florida Plants
- Field Guide to the Rare Plants of Florida
- Audubon Bald Eagle Nest Database

Based on the results of database searches, field reviews, and review of aerial photographs and soil surveys, field survey methods for specific habitat types and lists of target species were developed. Historic species occurrence results from the database searches based on a 1-mile radius from the study area were collected. Additionally, the environmental concerns expressed by the ETAT members in the ETDM Programming Screen Summary Report were considered when identifying target species and survey methods. Field reviews consisted of vehicular surveys of the study area. In the absence of physical evidence of a protected species, evaluation of the appropriate habitat was conducted to determine the likelihood of a species being present. During all surveys, visual observations were also conducted on adjacent lands. Any observations of protected plant and wildlife species or indicators of their presence (E.g. vocalizations, tracks, scat, burrows, etc.) within or immediately adjacent to the study area were documented including the the location of wood stork colonies and Core Foraging Areas (CFA).

Table 2-17. Federal and State-Listed with the Potential to Occur within the Project Corridor

Species	Potential for Adverse Effect			Federal/State Listing	Notes	Effect	
	Low	Medium	High				
Florida bonneted bat	<i>Eumops floridanus</i>	X			FED -E	lack of suitable habitat	no effect
Florida panther	<i>Puma concolor coryi</i>	X			Fed -E	lack of suitable habitat	no effect
Southeastern beach mouse	<i>Peromyscus polionotus niveiventris</i>	X			FED - T	lack of suitable habitat	no effect
West Indian manatee	<i>Trichechus manatus</i>	X			FED-T	lack of suitable habitat	no effect
Florida black bear	<i>Ursus americanus floridanus</i>	X			NL	lack of suitable habitat	no effect
Wood stork	<i>Mycteria americana</i>	X			FED-T	SF Determination Key 2010 / provide SFH compensation per section 404	NLAA
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	X			FED-E	lack of suitable habitat	no effect
Florida sandhill crane	<i>Grus canadensis</i>	X			FL-T	lack of suitable habitat	no effect
Bald eagle	<i>Haliaeetus leucocephalus</i>	X			NL*	lack of suitable habitat	no effect
Least tern	<i>Sternula antillarum</i>	X			FL-T	lack of suitable habitat	no effect

Black skimmer	<i>Rynchops niger</i>	X			FL-T	lack of suitable habitat	no effect
Eastern black rail	<i>Laterallus jamaicensis ssp. Jamaicensis</i>	X			FED-Proposed	lack of suitable habitat	no effect
Beach jacquemontia	<i>Jacquemontia reclinata</i>	X			FED-E	lack of suitable habitat	no effect
Tiny polygala	<i>Polygala smallii</i>	X			FED-E	lack of suitable habitat	no effect
American alligator	<i>Alligator mississippiensis</i>	X			FED - T*	lack of suitable habitat	no effect
American crocodile	<i>Crocodylus acutus</i>	X			FED - T	lack of suitable habitat	no effect
Eastern indigo snake	<i>Drymarchon corais couperi</i>	X			FED - T	lack of suitable habitat	no effect
Loggerhead sea turtle	<i>Caretta caretta</i>	X			FED - T	lack of suitable habitat	no effect
Leatherback sea turtle	<i>Dermochelys coriacea</i>	X			FED - E	lack of suitable habitat	no effect
Hawksbill sea turtle	<i>Eretmochelus imbricata</i>	X			FED - E	lack of suitable habitat	no effect
Smalltooth sawfish	<i>Athene cunicularia</i>	X			FL-T	lack of suitable habitat	no effect

2.24.5 Essential Fish Habitat

There is no involvement with Essential Fish Habitat (EFH) as the project area does not contain areas that support EFH or National Oceanic and Atmospheric Administration (NOAA) trust fishery resources; therefore, no EFH assessment or further consultation with National Marine Fisheries Service (NMFS) is required.

2.24.6 Highway Traffic Noise and Air Quality

Noise: An analysis of the project area regarding highway traffic noise was performed for existing conditions and the Preferred Alternative in accordance with Title 23 Code of Federal Regulations Part 772 (23CFR772), Procedures for Abatement of Highway Traffic Noise and Construction Noise (July 13, 2010) and Part 2, Chapter 18 Highway Traffic Noise of the FDOT PD&E Manual (dated July 1, 2020). Results of the analysis are included in the Noise Study Report (NSR), March 2022.

Two multi-family residential complexes are located along the north side of the canal within the project study area. These sites are shown below.

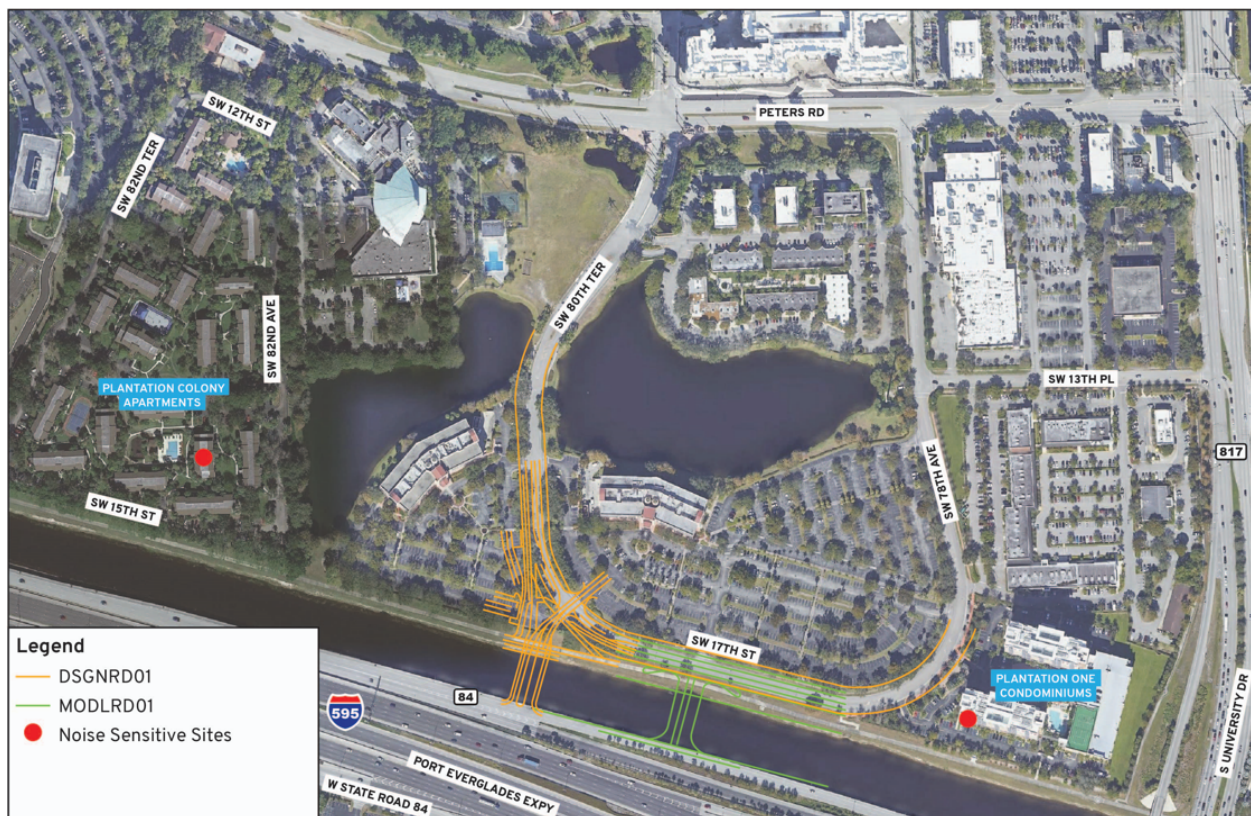


Figure 2-12. Noise Sensitive Sites

The Plantation One condominium complex is located approximately 1,000 feet to the east at the South University Drive/I-595 interchange and includes two high-rise buildings with balconies facing north and

south towards SR 84 and I-595. The Plantation Colony Apartments are located approximately 850 feet to the west and include two-story buildings with patios and balconies generally facing away from the roadway. Neither of these communities are protected from traffic noise with existing noise barriers along I-595 or SR 84.

The new bridge over the New River Canal will include three new low-speed traffic lanes and new intersections at each end of the bridge. The project will not substantially change the horizontal/vertical alignment or profile of the existing nearby roadways. However, given the addition of the new bridge, the project was screened for traffic noise impacts.

The traffic noise levels for the screening analysis for the Existing and Design Year Build Alternative were estimated using the FHWA's Traffic Noise Model (TNM), Version 2.5. This screening analysis was conducted using peak-hour traffic on the local roadway network near the Plantation One community.

Air Quality: An Air Quality Technical Memorandum has been prepared in accordance with Chapter 19 Air Quality of Part 2 of the FDOT PD&E Manual (dated July 1, 2020). An ETDM Programming Screen Summary Report was published on February 18, 2022, containing comments from the Environmental Technical Advisory Team. The summary degree of effect for air quality for all build alternatives was listed as 'Minimal' in the ETDM Programming Screen Summary Report.

The project is located in an area currently designated as being in attainment for the following criteria air pollutant(s): ozone/nitrogen dioxide/particulate matter (2.5 microns in size and 10 microns in size)/sulfur dioxide/carbon monoxide/lead. The No-Build and Recommended Build alternatives were subjected to the FDOT's carbon monoxide (CO) screening model (CO Florida 2012) that makes various conservative worst-case assumptions related to site conditions, meteorology and traffic. The FDOT's screening model for CO uses the latest United States Environmental Protection Agency (USEPA)-approved software to produce estimates of one-hour and eight-hour CO at default air quality receptor locations. The predicted CO levels can then be directly compared to the current National Ambient Air Quality Standards (NAAQS) for CO to determine if the project "passes" the screening model, or if exceedances are predicted to occur.

Since, only the intersection at the north end of the bridge will be controlled on more than one leg and will not include any free-flow legs, this was the intersection that was screened for potential air quality impacts. The No Build Alternative and recommended Build Alternative were evaluated for both the opening year (2025) and the design year (2045). Afternoon (PM) Peak-Hour traffic volumes are predicted to be higher overall at this intersection and were used for this analysis. Also, the posted speed limit on SW 80th Terrace and SW 17th Street, 25 miles per hour, was assigned to all intersection legs. The traffic data input used in the evaluation is shown in **Table 2-18**.

Table 2-18. Plantation Midtown Bridge Peak Hour TRAFFIC Volumes

Year	Location	Approach Direction	Peak Hour Directional Volume		Speed (MPH)
			No Build	Build	
Opening (2025)	SW 80 th Terrace	Eastbound	88	267	25
	SW 17 th Street	Westbound	133	302	25
	Bridge	Northbound	0	200	25
	Parking Area	Southbound	0	52	25
Design (2045)	SW 80 th Terrace	Eastbound	119	394	25
	SW 17 th Street	Westbound	155	447	25
	Bridge	Northbound	0	334	25
	Parking Area	Southbound	0	63	25

Estimates of CO were predicted for the default receptors which are located between 10 and 150 feet from the edge of the roadway. The results of the CO Screening Analysis are presented in the **Table 2-19**.

Table 2-19. Predicted Carbon Monoxide Levels

Year		Maximum CO Levels (PPM)	
		One-Hour (NAAQS – 35 PPM)	Eight-Hour (NAAQS – 9 PPM)
Opening (2025)	No Build	3.4	2.0
	Build	3.6	2.2
Design (2045)	No Build	3.4	2.0
	Build	3.7	2.2

Notes: CO = Carbon Monoxide, PPM = Parts per million, NAAQS = National Ambient Air Quality Standard.

2.24.7 Contamination

There are no potential contamination sites within the footprint of the two proposed project alternatives. Based on a review of Federal, State and local databases, there are no sites adjacent to or in the immediate vicinity of the alternative footprints that have been identified as having potential contamination concerns. From data gathered during further records reviews and site visits, there are no contamination sites within the footprint of the proposed alternatives, as outlined in the FDOT PD&E Manual, Chapter 20 Section 2.2.4. Reviews of all reasonably available information indicates contamination, including documented spills, leaks, soil or groundwater exposure, is not a problem at the time of this investigation, although continued monitoring is required. Field reviews did not result in the identification of potential sources of contamination or other signs of possible contamination that may indicate more assessments, interviews or investigations are needed at this time.

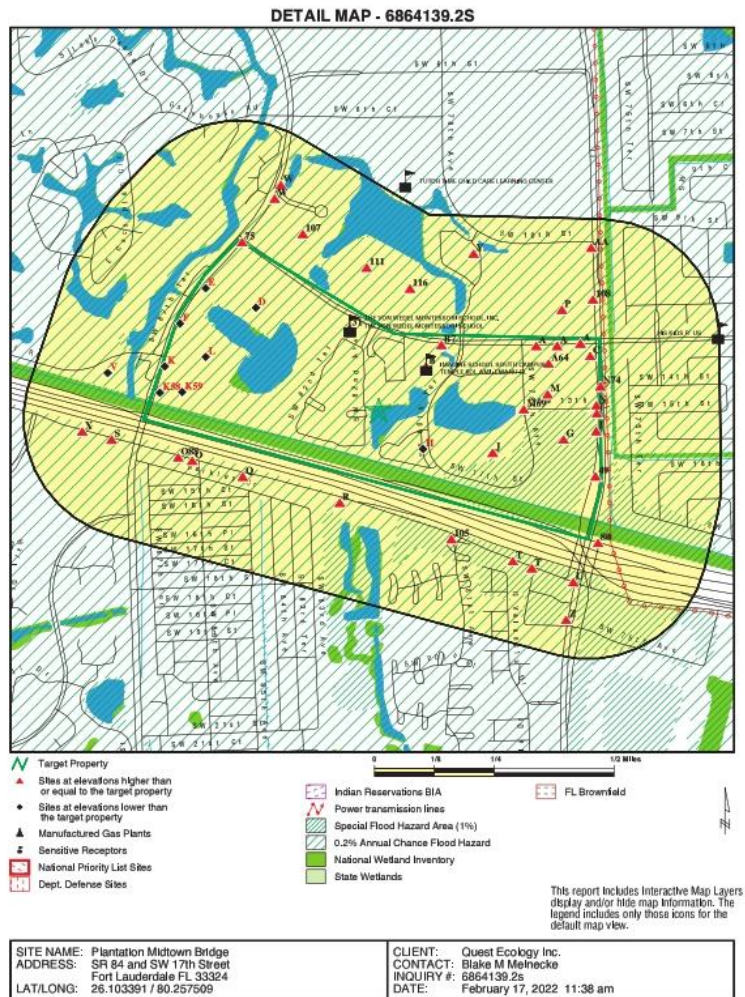


Figure 2-13. Potential Contamination Sites

3 Future Conditions

3.1 Future Conditions

The 2045 future year No-build scenario traffic volumes were developed by applying an appropriate growth rate to each study segment's 2021 traffic volume. Similar to the ACS report, a comparison was made of the three types of growth rates: historical growth rates from trend analysis, growth rates from model volumes, and the surrounding population and employment growth projections.

Peak hour turning movement volume projections were prepared for 2045 No-Build conditions using the TMTool spreadsheet and some minor manual adjustments. The same methodology as the ACS report was applied for the Build conditions. The SERPM 8.512 model was used to develop Annual Average Daily Traffic projections for the 2045 Build condition. A two-lane, two-way roadway link was added to the model between SR 84 westbound and Peters Road. Using the Build AADT and existing turning movement counts, balanced Build turning movement volumes were developed for AM and PM peak hours.

Details of the future traffic forecasting are provided in the “Traffic Forecasting for Plantation Midtown Bridge Improvement PD&E Study & Design Services” report. The 2045 peak hour volumes for both No-Build and Build Conditions are shown in the following figures.

Table 3-1. 2045 No Build Annual Average Daily Traffic (AADT) Volumes

Study Corridor	Intersection	Location	Historical Trend Analysis (2015-2019)*	Historical Trend Analysis (2009-2019)	2021 AADT	2015	2045
						Volume	Volume
Pine Island Road	SR 84 Westbound	Pine Island Road North of SR 84 Westbound	1.6%	0.7%	53,000	61,667	70,698
		SR 84 Westbound East of Pine Island Road	1.3%	0.3%	24,000	16,225	20,371
		SR 84 Westbound West of Pine Island Road	2.6%	1.1%	23,000	12,351	14,106
	SR 84 Eastbound	SR 84 Eastbound East of Pine Island Road	3.5%	2.6%	22,000	16,083	21,283
		Pine Island Road South of SR 84 Eastbound	4.9%	2.8%	43,000	39,325	44,113
		SR 84 Eastbound West of Pine Island Road	-5.3%	0.9%	24,000	20,513	24,898
	Peters Road	Pine Island Road North of Peters Road	-1.6%	-0.9%	54,000	58,994	67,823
		Peters Road East of Pine Island Road	-2.0%	-0.7%	18,500	12,828	16,932
		Pine Island Road South of Peters Road	1.6%	0.7%	52,500	61,667	70,698
University Drive	Peters Road	University Drive North of Peters Road	2.0%	-0.3%	66,500	66,432	70,989
		Peters Road East of University Drive	2.0%	3.2%	30,000	21,760	30,341
		University Drive South of Peters Road	2.2%	1.5%	83,500	73,186	82,721
		Peters Road West of University Drive	-2.0%	-0.7%	23,500	14,009	18,426
	SW 13th PI	SW 13th PI West of University Drive			3,700		
		University Drive North of SW 13th PI	2.2%	1.5%	64,500	73,186	82,721
		University Drive South of SW 13th PI	2.2%	1.5%	72,000	73,186	82,721
	SR 84 Westbound	University Drive North of SR 84 Westbound	2.2%	1.5%	80,500	56,289	63,322
		SR 84 Westbound East of University Drive	12.0%	-2.8%	31,500	23,496	31,695
		SR 84 Westbound West of University Drive	1.3%	0.3%	24,000	3,150	4,350
		SR 84 Eastbound East of University Drive	5.4%	0.9%	22,000	9,724	16,075
	SR 84 Eastbound	University Drive South of SR 84 Eastbound	-1.5%	-1.2%	63,500	67,531	74,771
SR 84 Eastbound West of University Drive		1.9%	-1.3%	20,500	11,451	13,820	
SW 80th Terrace	Peters Road	SW 80th Terrace North of Peters Road			4,200		
		Peters Road East of SW 80th Terrace	-2.0%	-0.7%	23,000	14,009	18,426
		SW 80th Terrace South of Peters Road			1,600		
		Peters Road West of SW 80th Terrace	-2.0%	-0.7%	18,500	12,828	16,932
SW 78th Ave	SW 13th PI	SW 13th PI East of SW 78th Ave			4,000		
		SW 78th Ave North of SW 13th PI			4,000		
		SW 78th Ave South of SW 13th PI			2,100		
	Peters Road	SW 78th Ave South of Peters Road			4,000		
		Peters Road West of SW 78th Ave	-2.0%	-0.7%	24,000	14,009	18,426
	Peters Road East of SW 78th Ave	-2.0%	-0.7%	24,000	14,009	18,426	
SW 17th Street	Midtown Bridge	Aetna North of SW 17th Street			800		
		SW 17th Street West of Midtown Bridge			200		
		SW 17th Street East of Midtown Bridge			200		
		Midtown Bridge South of SW 17th Street			n/a		

NOTE: * 2019 Historical trend analysis is from ACS report
 2021 Historical trend analysis AADT sites can be found in Appendix



Figure 3-1. 2021 AADT, 2025 and 2045 No Build Roadway AADT



Figure 3-2. 2045 No Build Intersection Turning Movement Volumes (AM and PM) Future Year

The AM and PM peak hour LOS for the arterials under the No Build condition are summarized in **Table 3-2**.

Table 3-2. 2045 No Build Peak Hour LOS

Roadway	Approach	AM		PM	
		Travel Time (sec)	Arterial LOS	Travel Time (sec)	Arterial LOS
Peters Road	EB	148.3	D	168.0	D
	WB	225.4	E	222.1	E
Pine Island Road	NB	715.9	F	561.4	F

	SB	526.8	F	505.5	F
SR 84	EB	295.7	F	236.9	F
	WB	489.7	F	635.9	F
University Drive	NB	321.9	F	600.3	F
	SB	322.9	F	415.5	F

The 2045 No Build LOS for the signalized intersections are shown in **Table 3-3**.

Table 3-3. 2045 No Build Intersection LOS

Intersection	AM Peak Hour		PM Peak Hour	
	Approach LOS	Approach Delay (sec/veh)	Approach LOS	Approach Delay (sec/veh)
University Drive at Peters RD	F	192.3	F	268.4
University Drive at SR 84 (WB)	F	112.1	F	117.1
University Drive at SR 84 (EB)	F	110.3	F	129.5
Peters Road at SW 80th Terrace	B	14.2	E	73.6
Pine Island Road at Peters Road	D	43	D	51.9
Pine Island Road at SR 84 (WB)	F	228.6	F	306.6

Pine Island Road at SR 84 (EB)	F	245.2	F	180.2
Peters Road at SW 78th Avenue	F	68	C	24.2
University Drive at SW 13th Place	E	45.3	F	60.6
SW 78th Avenue at SW 13th Place	A	5.8	A	7

As shown in the figures below, the study area arterials and intersections will benefit from the addition of the bridge by alleviating some of the congestion and distributing the traffic within the roadway network as compared to the No-Build conditions.



Figure 3-3. 2021 AADT, 2025 and 2045 Build AADT



Figure 3-4. 2045 Build Intersection Turning Movement Volumes (AM and PM)

All of the same roadways are operating below the minimum roadway LOS standard of D during the peak hours as were noted with the No-Build Conditions. However, there are improvements in the travel time during the peak hours compared to the No-Build Conditions. Most noticeably, University Drive experiences a 25% travel time reduction during the AM peak hour.

The forecasted peak hour LOS's are shown in Table 3-4.

Table 3-4. 2045 Build Alternatives Peak Hour LOS

Roadway	Approach	AM		PM	
		Travel Time (sec)	Arterial LOS	Travel Time (sec)	Arterial LOS
Peters Road	EB	134.8	D	259.4	F

	WB	255.5	E	240.5	E
Pine Island Road	NB	640.2	F	562.2	F
	SB	485.1	F	446.5	F
SR 84	EB	301.9	F	253.1	F
	WB	409.4	F	623.8	F
University Drive	NB	244.9	F	434.5	F
	SB	289.7	F	391.2	F

In 2045, the same 8 intersections from the No-Build analysis are also operating below the minimum LOS standard of D during the peak hours, with the exception of University Drive at SW 13th Place which only fails during the PM peak hour since the AM peak hour operations have improved. There are also slight improvements with the intersection delays as compared to the 2045 No-Build scenario . University Drive at Peters Road experiences a 13% reduction in delay during both peak hours, while at SR 84 WB intersection the delay is reduced by 25% during the PM. Likewise, the intersection of Pine Island Road and SR 84 WB experiences a 5% delay reduction during the AM peak hour. In addition, the 2 new bridge connections at SW 17th Street and at SR 84 westbound operate well at LOS B / C and A / A, respectively during the AM / PM peak hours.

Table 3-5. 2045 Build Intersection LOS

Intersection	AM Peak Hour		PM Peak Hour	
	Approach LOS	Approach Delay (sec/veh)	Approach LOS	Approach Delay (sec/veh)
University Drive at Peters Road	F	167.1	F	238.1
University Drive at SR 84 (WB)	F	97.6	F	93.4

University Drive at SR 84 (EB)	F	95.6	F	119.4
Peters Road at SW 80th Terrace	B	18.1	F	112.2
Pine Island Road at Peters Road	D	42.8	D	49.4
Pine Island Road at SR 84 (WB)	F	180.2	F	267.9
Pine Island Road at SR 84 (EB)	F	234.9	F	183.9
Peters Road at SW 78th Avenue	F	58.4	C	21.6
University Drive at SW 13th Place	C	31.8	E	42.5
SW 78th Avenue at SW 13th Place	A	6.4	B	11.1
Midtown Bridge at SW 17th Street	B	12.4	C	20.5
Midtown Bridge at SR 84 (WB)	A	2.8	A	5.8

4 Design Controls and Criteria

4.1 Project Design Controls & Criteria

4.1.1 Roadway Context Classification

Roadway context classification was obtained from FDOT District 4 and is described further in **Section 2.3** of this report.

4.1.2 Design Control and Criteria

The design criteria and standards are based on design parameters outlined in A Policy on Geometric Design of Highways and Streets (AASHTO, 2011), FDOT Design Manual (FDM) (FDOT, 2020), Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Street and Highways (Florida Greenbook 2018), Load Rating Manual (FDOT, 2020), Roadside Design Guide (AASHTO, 2011) Load and Resistance Factor Design (LRFD) Bridge Design Specifications (AASHTO, Eighth Edition and 2018 Interims).

Table 4-1 through **Table 4-5** list the design criteria established for the project.

Table 4-1. Design Control Criteria

Design Element	Facility Type	Design Criteria		
		FDOT FDM	AASHTO	Florida Green Book (2018)
Maximum Profile Grade	SR-84	6%	5% level, 6% rolling, 7% mountainous	6% flat, 7% rolling
	SW 17th Street	8%	7% level, 10% rolling, 14% mountainous	7% flat, 10% rolling
	Midtown Bridge	8%	7% level, 10% rolling, 14% mountainous	7% flat, 10% rolling
Maximum Change in Grade without	SR-84	0.7	-	0.7

Vertical Curve	SW 17th Street	1.0	-	1.0
	Midtown Bridge	1.0	-	1.0
Crest Vertical Curve	SR-84	K=98 (new Const.), Minimum Length=135 ft	K=61	K=61, Minimum Length=135 ft
	SW 17th Street	K=31 (new Const.), Minimum Length=90 ft	K=19	K=19, Minimum Length=90 ft
	Midtown Bridge	K=31 (new Const.), Minimum Length=90 ft	K=19	K=19, Minimum Length=90 ft

Table 4-2. Vertical Curve Criteria

Design Element	Facility Type	Design Criteria		
		FDOT FDM	AASHTO	Florida Green Book (2018)
Sag Vertical Curve	SR-84	K=79, Minimum Length=135 ft	K=79	K=79, Minimum Length=135 ft
	SW 17th Street	K=37, Minimum Length=90 ft	K=37	K=37, Minimum Length=90 ft

	Midtown Bridge	K=37, Minimum Length=90 ft	K=37	K=37, Minimum Length=90 ft
Minimum Vertical Clearance	Bridges over Mainline (Limited Access)	16.5' New; 16.0' Exist	14' Existing; 16' New	16.5'
	Bridges over Cross Roads (Non-LA)	16.5' New; 16.0' Exist	14' Existing; 16' New	16.0'
	Overhead Signs	17.5'	17'	-
	Dynamic Message Signs	19.5'	17'	-

Table 4-3. Horizontal Curve Criteria

Design Element	Facility Type	Design Criteria		
		FDOT FDM	AASHTO	Florida Greenbook (2018)
Maximum degree of Curve	SR-84	8°15' (R=694 ft)	11°75' (R=500 ft)	8°15' (R=694 ft)
	SW 17th Street	20°00' (R=286 ft)	30°28' (R=188 ft)	23°50' (R=250 ft)
	Midtown Bridge	20°00' (R=286 ft)	30°28' (R=188 ft)	23°50' (R=250 ft)
Length of Horizontal Curve	SR-84	Desirable = 675 ft	-	Desirable = 675 ft
		Minimum = 400 ft	-	Minimum = 400 ft
	SW 17th Street	Desirable= 450 ft	-	Desirable= 450 ft
		Minimum= 400 ft	-	Minimum= 400 ft

				400 ft
	Midtown Bridge	Desirable=	-	Desirable=
		450 ft		450 ft
		Minimum=	-	Minimum=
		400 ft		400 ft
Minimum Stopping Sight Distance	SR-84	360 ft	360 ft	360 ft
	SW 17th Street	200 ft	200 ft	200 ft
	Midtown Bridge	200 ft	200 ft	200 ft
Decision Sight Distance	SR-84	-	800 ft	800 ft
	SW 17th Street	-	535 ft	535 ft
	Midtown Bridge	-	535 ft	535 ft
Superelevation Transition	Tangent (% of Superelevation length)	80%	60%-80%	80%
	Curve (% of Superelevation length)	20%	40%-20%	20%
Maximum Superelevation	High speed roadways	10%	6% - 12%	10%
	low speed roadways	5%	6% - 12%	5%
	Local Roads	5%	6%	5%

Table 4-4. Typical Section Criteria

Design Element	Facility Type	Design Criteria		
		FDOT FDM	AASHTO	Florida Greenbook (2018)
Lane Widths	SR-84	11 ft	11 ft - 12 ft	11 ft
	SW 17th Street	10 ft	10 ft - 12 ft	10 ft

	Midtown Bridge	10 ft	10 ft - 12 ft	10 ft
Shoulder Width – Roadway Inside (or Left)		Total (Paved)	Total	Total
	SR-84	8 ft (4 ft)	4 ft	4 ft
	SW 17th Street	8 ft (4 ft)	4 ft	4 ft
	Midtown Bridge	8 ft (4 ft)	4 ft	4 ft
Shoulder Width – Roadway Outside (or Right)		Total (Paved)	Total	Total
	SR-84	10 ft (5 ft)	4 ft	8 ft
	SW 17th Street	10 ft (5 ft)	4 ft	8 ft
	Midtown Bridge	10 ft (5 ft)	4 ft	8 ft
Inside Shoulder Width – Bridge Structure	SR-84	6 ft	4 ft	4 ft
	SW 17th Street	6 ft	4 ft	4 ft
	Midtown Bridge	6 ft	4 ft	4 ft

Table 4-5. Typical Section Criteria

Design Element	Facility Type	Design Criteria		
		FDOT FDM	AASHTO	Florida Greenbook (2018)
Outside Shoulder Width – Bridge Structure	SR-84	10 ft	4 ft	4 ft
	SW 17th Street	10 ft	4 ft	4 ft
	Midtown Bridge	10 ft	4 ft	4 ft

Typical Roadway Cross Section Slopes:	SR-84	2%	1.5% - 3%	1.5% - 4%
	SW 17th Street	2%	1.5% - 3%	
	Midtown Bridge	2%	1.5% - 3%	
	Outside Shoulder	6%	2% - 6%	2% - 6%
Recoverable Terrain (Min. from edge of travel)	SR-84	24 ft	24 ft-28 ft	24 ft
	SW 17th Street	12 ft	7 ft- 10 ft	7 ft
	Midtown Bridge	12 ft	7 ft- 10 ft	7 ft
Border Width:	SR-84	14 ft	5 ft	-
	Sw 17th Street	12 ft	5 ft	-
	Midtown Bridge	12 ft	5 ft	-

5 Alternatives Analysis

5.1 Previous Planning Studies

The Plantation Midtown Master Plan was adopted in November of 2003 with the purpose of retrofitting and revitalizing the area that was characterized by suburban sprawl, auto-orientation, and pedestrian impediments to a transit-oriented design with strong pedestrian components. The Plantation Midtown District encompasses approximately 860 acres and is bounded by University Drive to the east, Interstate 595 to the south, Pine Island Road to the west, and Cleary Boulevard to the north.

Since the adoption of the Master Plan, the Midtown District has evolved into a regional hub of commercial and employment activities with residential neighborhoods and a significant daytime employee population. Future growth in the City of Plantation is expected to continue to be focused within the Plantation Midtown Area.

In 2019, the Broward MPO and FDOT District 4 initiated the I-595 Arterial Connectivity Study (I-595 ACS). The study area is in central Broward County, Florida along the I-595 and SR 84 corridor, between SW 136th Avenue and SR 7/US-441. The purpose of this study is to identify and define transportation problems, develop effective solutions to fulfill the goal of providing better connectivity for all modes, and to provide congestion relief for travel along the north-south study roadways and their access points with I-595 and SR 84. All types of improvement strategies have been considered including land use and policy strategies; geometric modifications to roadways; pedestrian, bicycle, greenway, and transit infrastructure improvements; and, technology and traffic signal improvements. The study includes eight (8) north/south arterials that cross I-595 and SR 84; one mile to the north and one mile to the south of I-595 including:

- Pine Island Road from SW 3rd Street to south of Nova Drive
- University Drive/SR 817 from Federated Road to SW 30th Street

The concept of the Plantation Midtown Bridge project was first analyzed as part of this effort and is documented in Technical Memorandum 2: Midtown Bridge Traffic Data and Traffic Projections that was completed in September 2020. The study used the Southeast Regional Planning Model Version 8 (SERPM 8) to assess the shift in traffic volumes due to the bridge providing an alternative option for trips that are destined to, and from, the Plantation Midtown area and Westbound SR 84. A new two-lane, two-way roadway link was added to the model network between SW 17th Street and westbound SR 84 representing the bridge. The connection was assumed to be located just east of where the existing westbound I-595 off-ramp connects to westbound SR 84.

The results of the study shows that the proposed new bridge connection should produce significant congestion relief in the study area. The daily model projections show that the proposed Plantation Midtown bridge could attract 18,855 AADT in 2045 and has the potential to effectively reduce traffic on Pine Island Road, University Drive and Westbound SR 84 as follows:

- Pine Island Rd north of SR 84 2045 AADTs 65,500 to 61,000 AADT (approximately 7% reduction)

- University Dr north of SR 84 2045 AADTs 103,000 to 90,500 AADT (approximately 12% reduction)
- SR 84 east of Pine Island Rd 2045 AADTs 31,000 to 29,500 AADT (approximately 2% reduction)

5.2 No Build (No-Action) Alternative

The No Build alternative leaves the study area roadway network as is with no new bridge connection between the Midtown Business District and WB SR 84 of the SFWMD Canal.

5.3 Build Alternatives

A Typical Section alternatives analysis was performed for the future worst-case conditions in 2045 during the PM peak hour to determine the typical section number of lanes. The focus of the analysis was to determine lane assignments and storage needs to assure that the NB entrance to Midtown Business District on the bridge will not spill back onto WB SR 84. Two alternatives were analyzed - Option 1 - assuming the proposed bridge to be three lanes (two lanes northbound and one lane south bound) versus Option 2 - two-lanes (one northbound and one southbound). Note that the analysis was based on the intersection of WB SR 84 at the proposed bridge to be right-in and right-out access only, with stop-sign control for the SB right and there will be NB stop on the at SW 17th Street and the intersection will be a four way stop.

The analysis results show there is a slight increase in the overall intersection delay by about 2.5 seconds and the NB approach Level of Service decreases slightly to C under Option 1. The most notable difference is the increase in the 95th percentile queue length for the NB approach from 42.5 feet with the three-lane option versus 122.5 feet with the two-lane option. Because the increased queue for the two lane section is almost three (3) times the three lane typical, the Three Lane Typical section has been selected. Note: the bridge segment is proposed to accommodate 250 feet.

Typical Sections were developed for the three lane option including bridge wall clearance and a with and without median. **Figure 5-1** shows two concepts.

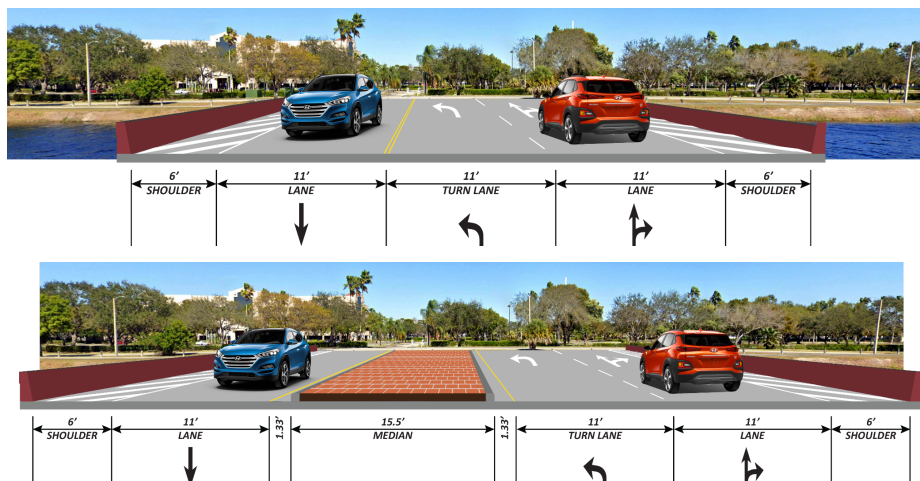


Figure 5-1. Typical Section Concepts

Once the lane assignments were determined, alternative bridge locations were analyzed. Two conceptual alternatives were identified based on logical termini, driveway access on SW 17th Street and the WB SR 84 and WB I-595 merge point. **Figure 5-2** shows the two (2) Alternative locations.

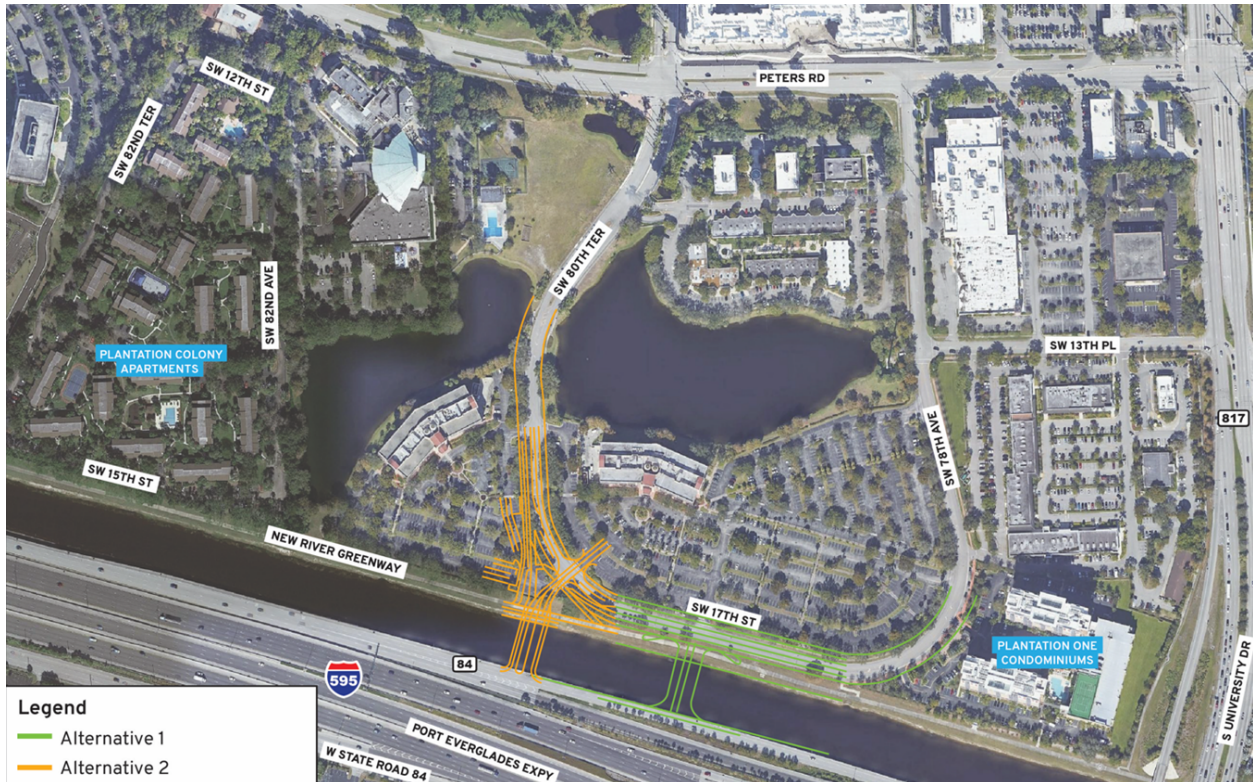


Figure 5-2. Midtown Bridge Alternatives

5.4 Build Alternative 1 - Eastern Alignment

Build Alternative 1 (shown in green on Figure 5-2) provides a bridge connection for direct access from the bridge to the central SW 17th Street driveway to the Jacaranda Parcel 834 133-28 B Tract "D". This Alternative is located approximately 1,350 west of University Drive and 1000 feet from the merge point of WB SR 84 and WB I-595. The intersection of WB SR 84 at the proposed bridge will be right-in and right-out access only, with stop-sign control for the southbound right movement, while the intersection of SW 17th Street will be full access with an all-way stop control.

Note that this alternative does not encroach upon any private property and can be implemented without any reconfiguration of driveways, tree removal or loss of parking. This alternative will create a single conflict point with the New River Greenway. High visibility pavement markings and signage will be utilized to mitigate impacts.

Alternative 1 will require some redesign on WB SR 84 vertical clearance in order to meet the bridge height. Because there is a landscape buffer between WB SR 84 and the NB University Drive to WB I-595

ramp from University Drive there will be no impacts to the I-595 Ramp.

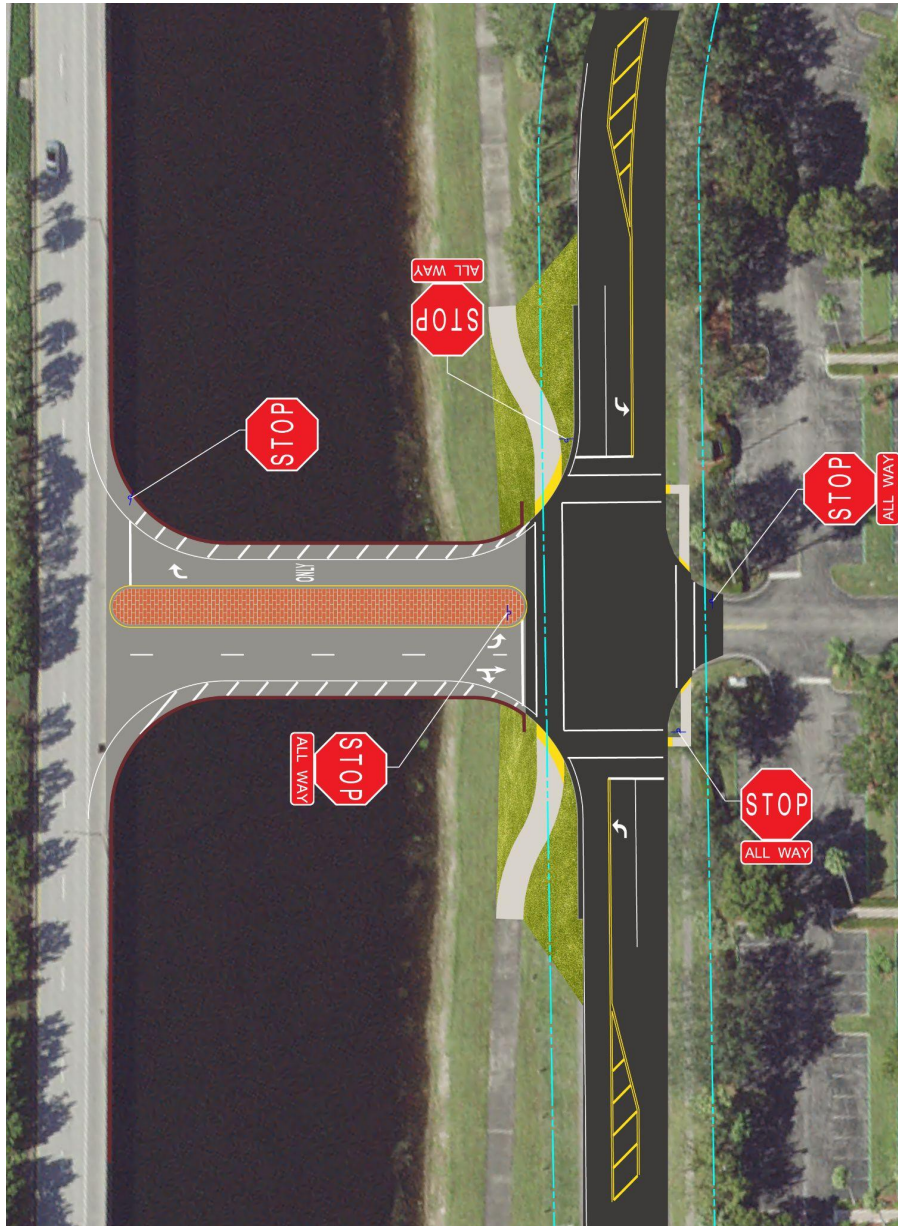


Figure 5-3. Alternative 1

5.5 Build Alternative 2 - Western Alignment

Build Alternative 2 (shown in orange on Figure 5-2) provides a bridge connection that directly accesses the bridge from the Jacaranda Parcel 834 133-28 B Tract "D" driveway on the north side of SW 17th Street. This Alternative is located approximately 1,750 west of University Drive and 600 feet from the merge point of WB SR 84 and WB I-595. The intersection of WB SR 84 at the proposed bridge will be right-in and right-out access only, with stop-sign control for the southbound right movement, while the

intersection at SW 17th Street will be full access with an all-way stop control. Note that this alternative is at the juncture where SW 17th Street curves north to become SW 80th Terrace as a result, the intersection at 17th Street is a diagonal connection to the driveway on the north. The driveway connection also impacts the New River Greenway as there will be two conflict points where the Greenway crosses traffic lanes.

Note that this alternative requires the taking of private property, reconfiguration of a driveway, loss of parking spaces and removal and relocation of trees all impacting Jacaranda Parcel 834 133-28 B Tract C located at the west end of SW 17th Street.

Alternative 2 will require significant reconstruction of not just SR 84 but the I-595 Exit Ramp to Pine Island Road due to the vertical clearance requirements of the bridge. Under this Alternative the bridge will meet at the beginning of the gore area for the merge between WB SR 84 and WB I-595 which will require vertical height improvements to match the ramp. This will also require more extensive maintenance of traffic and impacts to



Figure 5-4. Alternative 2

5.6 Comparative Alternatives Evaluation

The Build Alternative 1 and Alternative 2 as well as the No Build alternatives were compared side-by-side in an evaluation matrix using criteria including engineering, cost and environmental factors. Criteria related to Safety, the Purpose of the project from the Purpose and Need Statement and relevant criteria where there is a difference between the alternatives were selected. The results show that Alternative 1 is the best option.

Table 5-1. Alternatives Comparative Matrix

Measure of Effectiveness	No-Build	Alternative 1	Alternative 2
Safety	No Improvement	Crash Reduction	Crash Reduction
Purpose			
Capacity	No Improvement	Reduced Delay on Pine Island and University Drive	Reduced Delay on Pine Island and University Drive
Transportation Demand	No Improvement	Provides 3 Lanes New Capacity	Provides 2 Lanes of New
System Linkage	No Improvement	New Connector	New Connector
Economic Development	No Impact	Improved Access to South District	Improved Access to South District
Modal Interrelationships	No Improvement	Opportunity to Connect to 595 Express	Opportunity to Connect to 595 Express
Infrastructure			
Private Right of Way	No Impact	No Impact	-25,320 Sqft (.58 Acres)
Private Parking	No Impact	No Impact	-12 Spaces
New River Greenway	No New Roadway Crossing	One New Conflict Point	Two New Conflict Points
Proximity to WB SR 84 and WB 595 Merge Point	No Impact	1,000 Feet From Merge Point	600 feet from Merge Point
Tree Impacts	No Impact	May Impact 1 Tree	Remove/Relocate 11 Trees
Cost	N/A	Will Require a Lower Cost than Alternate 2 as there is a lower cost for Vertical Clearance	Will Require a Lower Cost than Alternate 2 as there is a higher cost for Vertical Clearance
TOTAL POINTS	-5	8	-3
	+2 Pts	Significant Positive Impact	
	+1 Pts	Positive Impact	
	0 Pts	No Change	
	-1 Pt	Negative Impact	
	-2 Pts	Significant Positive Impact	

5.7 City of Plantation Selected Alternative

Based on the engineering, and environmental analysis and results, Alternative 1 was determined to best to satisfy the project's purpose and need while minimizing adverse impacts. Alternative 1 is the City's Selected Alternative and is further detailed in Section 7 of this document.

6 Project Coordination and Public Involvement

6.1 Agency Coordination

Agency coordination has occurred throughout the PD&E phase of the project and will continue as the project moves forward into subsequent design and construction phases. Agency coordination documentation is included in **Appendix G** -Public Information Plan of this report. Listed below is a history of the events to date:

- Advance Notification and ETDM – October 2021
- Public & Agency Kickoff Newsletter prepared and distributed - June 2021
- Town of Davie - The Town of Davie was invited to participate in three progress meetings. The dates are as follows : October 11, 2021, November 30, 2021, and January 31, 2022. The town Council members and the Town’s Engineer were also invited to attend the Public workshop meeting on December 9, 2021. A list of elected officials and agencies invited to the Public workshop meeting can be found in the appendix of the PIP.
- FDOT District 4 Coordination has been conducted throughout the process. Representatives from FDOT 4 attended the Public workshop meeting held on December 9, 2021. A list of attendees can be found in the PIP.
- Coordination with the Broward MPO on the Multi Modal Planning effort continues to be conducted. Paul Calvaries attended the Kick-off meeting held on June 2, 2021.
- Broward County Commissioners were invited to the Public Workshop meeting held on December 9, 2021. The South Florida Regional Planning agency and Gregory Stewart from Broward MPO were also invited to the Public Workshop meeting. A list of elected officials and agencies invited to the Public workshop meeting can be found in the appendix of the PIP.
- Public Additional Agency coordination is TBD and will be entered as the project progresses.

6.2 Public Involvement

Public outreach and involvement are important to the success of the project. This outreach effort will continue as the project moves forward into subsequent phases. The Public Involvement Summary Report (prepared within the Public Involvement Plan) contains documentation of the items listed below. Listed below is a history of the public outreach events to date:

- Public Newsletter prepared and distributed - May 2022
- Public (Hybrid) Information Meeting #1– December 9, 2022, 6:00 PM-7:00 PM; The project information was presented and displayed for the public and agencies in attendance at the City of Plantation City Hall. Project representatives were on hand to discuss the concepts and answer questions. A PowerPoint presentation was conducted and there were no comments from the General Public. The Public Involvement Summary Report was prepared under a separate cover under the Public Involvement Plan.
- Public Hearing – Is scheduled for June 8, 2022 at The City of Plantation City Hall

7 Design Features and Preferred Alternative

7.1 Engineering Details of the Preferred Alternative

The Preferred Alternative (Alternative 1) is discussed in further detail in the following sections. These improvements are depicted in **Appendix A** the Concept Plans.

7.1.1 Midtown Bridge

The Midtown Bridge includes: 2- 11' lanes in the NB direction and 1-11' lane in the SB direction; 15.5' median and 6' shoulders. **Figure 7-1.** depicts the proposed bridge Typical Section.

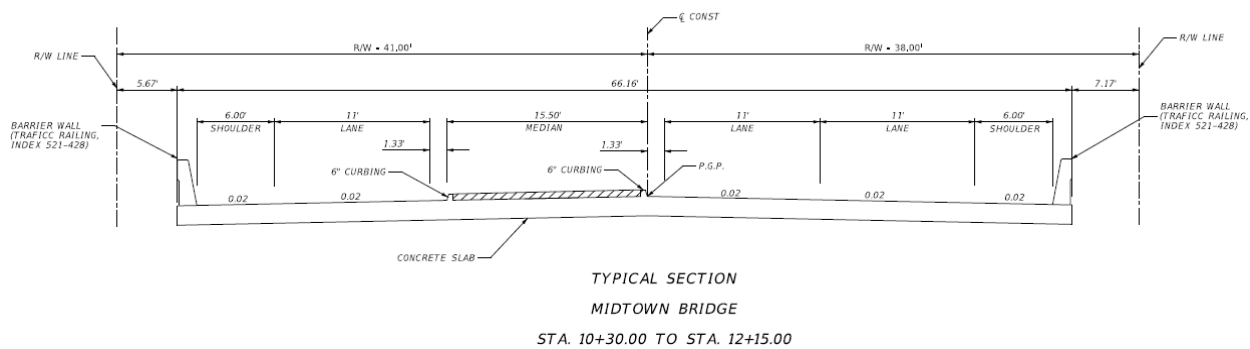


Figure 7-1. Proposed Midtown Bridge

7.1.2 SW 17 Street

SW 17 Street will need to be raised within the project limits in order to meet the vertical clearance criteria set by SFWMD. The typical section will remain as a 2-lane undivided roadway with left turn lanes at the intersection with the Midtown Bridge. The New River Greenway will be relocated closer to 17 Street in order to provide the crossing at the bridge. Figure 7-2 depicts the proposed Typical section for SW 17 Street.

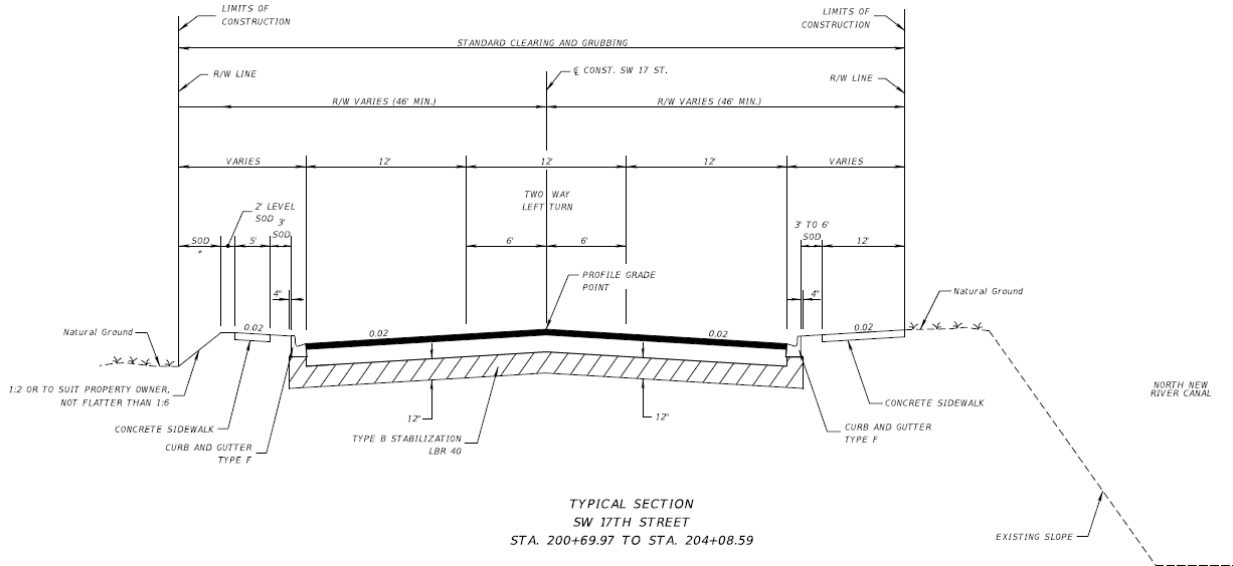


Figure 7-2. Proposed SW 17 Street

7.1.3 SR 84

SR 84 will also need to be raised within the project limits in order to meet the vertical clearance criteria set by SFWMD. The typical section will remain as a 2-lane one way roadway with 10' shoulders. Figure 7-3 depicts the proposed Typical section for SW 17 Street

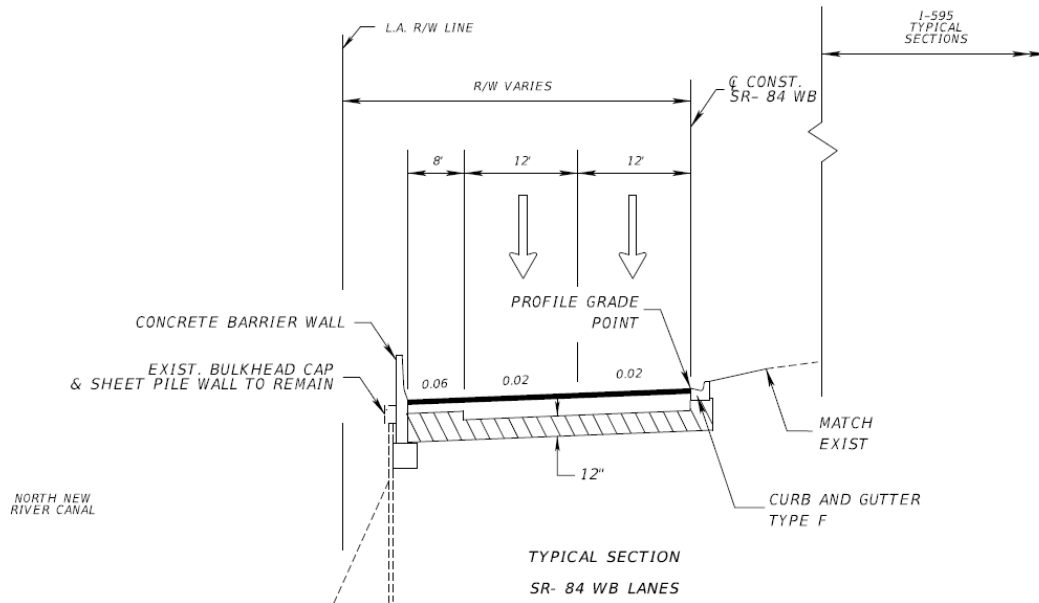


Figure 7-3. SR 84

7.1.4 Bridge Analysis

As part of the new bridge the existing retaining wall will need to be modified approximately 200' to the east and west of the bridge to match proposed vertical geometry.

The proposed bridge typical section will consist of a 66.16ft wide bridge composed of: 1.5ft Single Slope Traffic Railing, 6ft Outside Shoulder, one Southbound 11ft Travel Lane, 1.33ft Inside Shoulder, 15.5ft Median, 1.33ft Inside Shoulder, two Northbound 11ft Travel Lanes, 6ft Outside Shoulder and a 1.5ft Single Slope Traffic Railing.

The bridge will be 180'-0" long. The bridge will utilize an 18" thick concrete deck. The simply supported spans will rest on 18" precast prestressed concrete piles with cast-in-place concrete caps. The minimum vertical clearance from the low member is 5.25 feet to the Design Water Surface and 7.25 feet to the Optimum Water Surface.

Bridge aesthetics will be level 3 and will be coordinated with the City of Plantation during the Final Design Phase.

Appendix E- Structures Analysis Report was prepared as part of this PD&E Study

7.1.5 Horizontal and Vertical Geometry

The horizontal geometry of the Preferred Alternative is shown on the Concept Plans in **Appendix A**.

The Preferred Alternative proposes a median divided bridge with a left turn and a shared through-right turn lane for the northbound lanes and a right turn lane for the southbound. 6 foot wide outside shoulders are being proposed for both northbound and southbound lanes. The horizontal alignment of the bridge consist of a tangent section without horizontal curves, connecting at 90 a degree angle to the both SR-84 and SW 17th Street's alignments

Vertical Geometry

The Preferred Alternative for the bridge's vertical alignment proposes a parabolic curve at the center of the alignment. The length of the vertical curve is 130 feet and K value of 19.12. The curve is connecting 2 tangent sections of (+) 3.5% and (-) 3.3% which tie to SR-84 and SW 17th Street center line of construction.

7.1.6 Bicycle and Pedestrian Accommodations

The Preferred Alternative maintains the existing bicycle and pedestrian facilities in place. Pedestrian enhancements include a new crossing from the existing sidewalk on the north side of SW 17 Street to the New River Greenway. The crosswalk will be at the All-Way Stop controlled intersection providing connectivity not currently in place.

7.1.7 Access Management

The existing and recommended access management conditions for the project are depicted in the Concept Plans in **Appendix A**.

WB SR 84 is classified as a Limited Access Facility with Access Management Classification 1 within the study limits because it is included within the I-595 right of way. This PD&E Study is being conducted as part of the condition to break the Limited Access Line. The Bridge will be located 1400 feet west of the intersection of University Drive and 1000' east of the merge point to the I-595 Exit Ramp. A permit will be required from FDOT. The access will be right in/right out only at the bridge. It is noted that EB SR 84 is not a limited access facility and it is classified as Access Management Class 3.

SW 17 Street- a four way stop intersection will be constructed at the intersection of the Bridge with SW 17 Street. SW 17 Street is classified as Access Management 6 with unrestricted access.

7.1.8 Utilities

Preliminary utility coordination was initiated through written communication to the listed utility agency owner (UAO) contacts and will continue through the Final Design Phase. The project is not expected to have significant utility impacts.

7.1.9 Drainage and Stormwater Management Facilities

The drainage design incorporates FDOT and SFWMD design parameters. The proposed drainage will be divided into two basins. Basin-1 and Basin-2. The division line for the proposed Basins is the high point of the proposed bridge. The north portion of the bridge is located in Basin-1 (SW 17th Street side) and the south portion of the bridge is located in Basin-2 (SR 84 side).

Basin 1 - SW 17 Street

There is no existing drainage permit found in this area. Water quality and quantity will be compensated by the proposed swale and exfiltration trench which are located along SW 17th street. The water quality and quantity generated from this basin will be compensated by the exfiltration trench and the dry detention swale. Basin-1 will be connected to the SW 17th street drainage system by surface runoff.

Basin 2 - SR 84

Basin-2: The rainwater from this basin will be making a direct surface runoff to SR 84,

which will be ultimately connected to the I-595 drainage system. (See the existing drainage system section 3.3, for detail). According to the existing drainage permit (application number 091015-16) of I-595 drainage system has some extra capacity in teams of water quality and quantity. The water quality and quantity generated from this basin will be compensated by the extra capacity of the I-595 drainage system.

There will be no deck drain that has been proposed on the proposed bridge. Because the bridge has a shorter length and wider shoulder, which will compensate for the spread issue in the bridge.

7.1.10 Floodplain Analysis

The project area is located in Flood Zone AE. Flood Zone AE has an elevation of 6 feet in this area (See

Appendix-B). The low member elevation of the bridge is 8.9 feet NGVD 88 (10.5 feet NGVD 29) (See Appendix-C). So, the bridge will be above the Flood Zone which will not make any effect on canal flow.

The following items have been addressed to document that the floodplain encroachments will be minimal.

1. **History of Flooding:** The project area is on and around the vicinity of an artificial control canal. The control structure is located around 1.5 miles downstream of the project location. The name of the control structure is G-54. The headwater elevation has been analyzed from 1969 to the present year, the max elevation found is 5.825 ft NAVD 88 (See Appendix-A). The top of the bank elevation is around 8.25 ft NAVD 88. So, it could be concluded that there is no historical flooding condition found in the project area.
2. **Longitudinal or Transverse Encroachments:** Longitudinal encroachment refers to the placement of fill in the floodplain, such as for building a road parallel to the edge of a river. Transverse encroachment, meaning that the encroachment is perpendicular to the flow of the stream. The project is making transverse encroachment. The project area is located in Flood Zone AE. Flood Zone AE has an elevation of 6 feet in this area (See Appendix-B). The low member elevation of the bridge is 8.9 feet NGVD 88 (10.5 feet NGVD 29) (See Appendix-C). So, the bridge will be above the Flood Zone which will not make any effect on canal flow.
3. **Avoidance Alternatives:** In this case where no prudent and feasible avoidance alternatives exist. So, it is not necessary to find the practicability of avoidance alternatives and/or measures to minimize impacts.
4. **Emergency Services and Evacuations:** North new river canal, SW 17th street and S.R. 84 have no history of stormwater overtopping. Therefore, no emergency services or evacuation opportunities will be adversely affected.
5. **Base Flood Impacts:** The project's drainage design will be consistent with local, Federal Emergency Management Agency (FEMA), FDOT, and South Florida Water Management District's (SFWMD) design guidelines. Moreover, the new river canal is an artificial control canal, and one of the functions of this canal is to control the drainage of the surrounding area of the canal. Therefore, no significant changes in base flood elevations or limits will occur.
6. **Regulatory Floodway:** A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Based on SFWMD district, the upstream elevation could increment/head loss should be less or equal to 0.1 feet (See Appendix-C). For quantified the increment of the water surface elevation/head loss, see Required Bridge Hydraulic Report, where it is shown the head loss is less than 0.1'. Therefore, no negative impact will occur in the Regulatory Floodway.
7. **Natural and Beneficial Floodplain Values:** Natural floodplains provide flood risk reduction benefits by slowing runoff and storing flood water. They also provide other benefits of considerable economic, social, and environmental value that are often overlooked when local land-use decisions are made. Floodplains frequently contain wetlands and other important

ecological areas which directly affect the quality of the local environment. Some of the benefits of floodplains to a functioning natural system include:

- Fish and wildlife habitat protection
- Natural flood and erosion control
- Surface water quality maintenance
- Groundwater recharge
- Biological productivity
- Higher quality recreational opportunities.

The project does not impact or create floodplains, therefore, no natural and beneficial floodplain values will be significantly affected.

8. **Floodplain Consistency and Development:** Part of the project area is consistent with the City of Plantation Stormwater Master Plan. This project will not encourage floodplain development due to local (FEMA) floodplain and SFWMD regulations.
9. **Floodplain/FIRM:** The FEMA FIRM panel (12011C0535H effective 08/18/2014) showing the project corridor is shown in Appendix B.
10. **Risk Assessment:** Floodplain encroachments are not significantly increased by this project's build alternative, as discussed further within this report.

7.1.11 Transportation Management Plan

The goal of a Transportation Management Plan (TMP) is to minimize congestion during construction by managing traffic through the project area. A complete TMP will be prepared during the final design that also contains details for project specific elements that may require adjustments or precautions prior to construction.

The TMP is to include a well-prepared Temporary Traffic Control Plan set, and a Public Information Plan.

Temporary Traffic Control Plan (TTCP)

A TTCP is required for all work zones within, or adjacent to highways, roads and streets as specified by Florida Statute and Federal regulations. TTCP shall be in accordance with the FDOT Design Manual and FDOT Standard Plans. The primary purpose of the TTCP concept is for the safety of construction crews and to minimize the disruption of the traveling public during construction. This includes provisions for the construction of a paved shoulder throughout all phases of construction. It is anticipated that the milling, overbuild and resurfacing required for the project can be accomplished primarily through TTCP typical sections conforming to the FTE Lane Closure Policy and the Manual on Uniform Traffic Control Devices (MUTCD). Some of these typical applications have been modified by the Standard Plans, 102 Series. Portable changeable message signs (PCMS) and arrow boards, plus channelizing devices will be used for lane shifts.

The preliminary TTCP is depicted in the Concept Plans- **Appendix A**. Below outlines the TTCP approach for the project.

Phase I

SR-84- The existing shoulder and outside lanes will be closed according to FDOT Standard Plans 102-613. Barrier wall will be needed due to the drop off.

SW 17 Street- close the street to traffic. The contractor will be allowed to use this area for staging as well as construction.

Construct the bridge, modify the existing retaining wall and construct drainage on SR 84 and build all improvements on SW 17 Street.

Phase II

Once the new retaining wall is constructed, shift traffic on SR 84 to the newly constructed outside lane and construct the inside lane and buffer area.

Maintenance of New River Greenway

The New River Greenway will be temporarily diverted to the north side of SW 17 Street around the work zone. Longitudinal Channelizing Devices (LCD) will be used to delineate the path.

Maintenance of Pedestrian Access

Longitudinal Channelizing Devices (LCD) will be used to maintain pedestrian access where construction impacts local streets with pedestrian crossings. Detailed plans and details will be determined during the design phase and shown in the construction plans.

Maintenance of Drainage

Existing drainage will be used during construction.

Work Zone Pavement Markings

Proposed pavement markings are to adhere to the requirements in FDOT Standard Plans series 102-600. All proposed, temporary, or existing pavement markings to be removed must be detailed completely in the construction plans for a proper layout. High pressure water blasting is the only acceptable method for the removal of conflicting pavement markings.

7.1.12 Special Features

As this will be one of the main entrances to the City of Plantation Midtown District, there will be an entry sign, decorative lighting, special Landscaping and other special features to be finalized during the design phase.

7.1.13 Design Variations and Design Exceptions

There will be no Variations or Exceptions for this project.

7.1.14 Cost Estimates

The Department’s Long-Range Estimating (LRE) system was used to prepare cost estimates for the Preferred Alternative. **Table 7-1** summarizes the project costs. Note that in collaboration with the MPO it is recommended that up to four midblock pedestrian crossings be implemented along SW 80th Terrace and SW 78th Avenue to allow pedestrians and cyclists to cross safely and for better connectivity between land uses on either side of the street. The location of these crossings should be decided as part of the redevelopment of the area and the site plan layout of the large tract on the north side of SW 17th Street. three (3) midblock ped

Table 7-1. Project Cost Summary

Project Cost Summary	
Construction Bridge	\$5.5 M
Design (Funded)	\$0.5 M
Raised Crosswalk RFBS (4)	\$0.8 M
Construction Engineering & Inspection	\$1.0 M
Total	\$7.8 M

7.2 Summary of Environmental Impacts of the Preferred Alternative

Various supporting environmental documents were prepared as a part of this study. Summaries of the findings of each are included in the following sections. For more detailed results, refer to the State Environmental Impact Report (SEIR) or the individual reports referenced in the sections.

7.2.1 Right-of-Way & Relocations

No additional right-of-way will be required for design Alternative 1.

7.2.2 Future Land Use

The future land use for the study area was determined to be Office Park (limited Commercial) based on the City of Plantation Future Land Use Map.

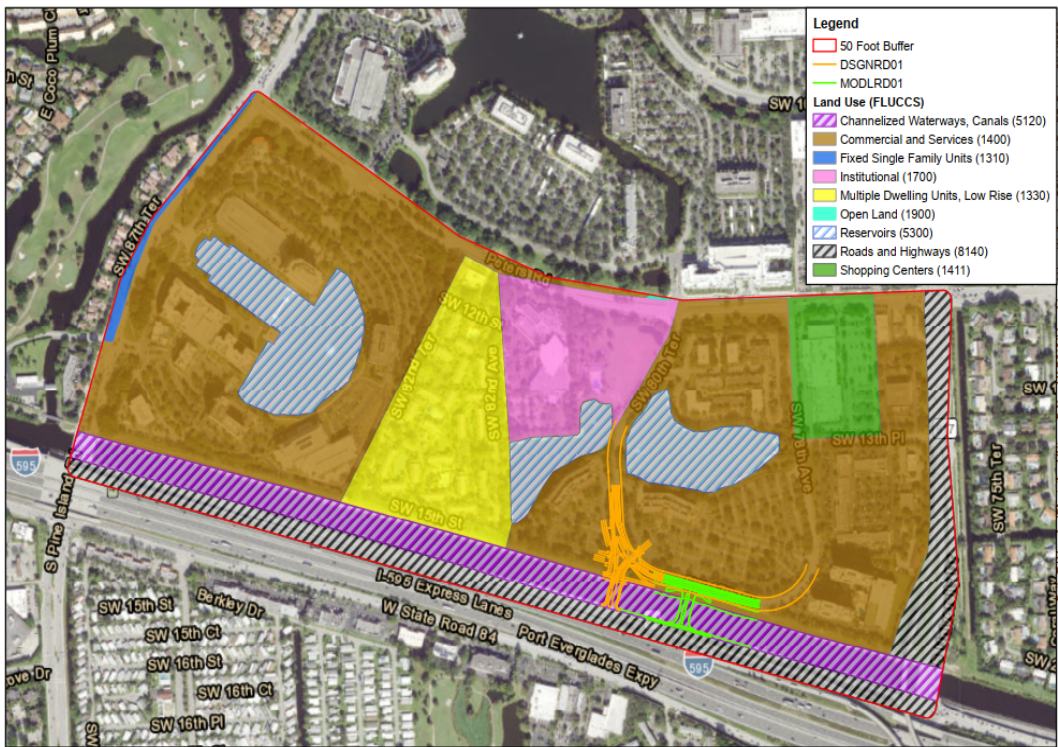
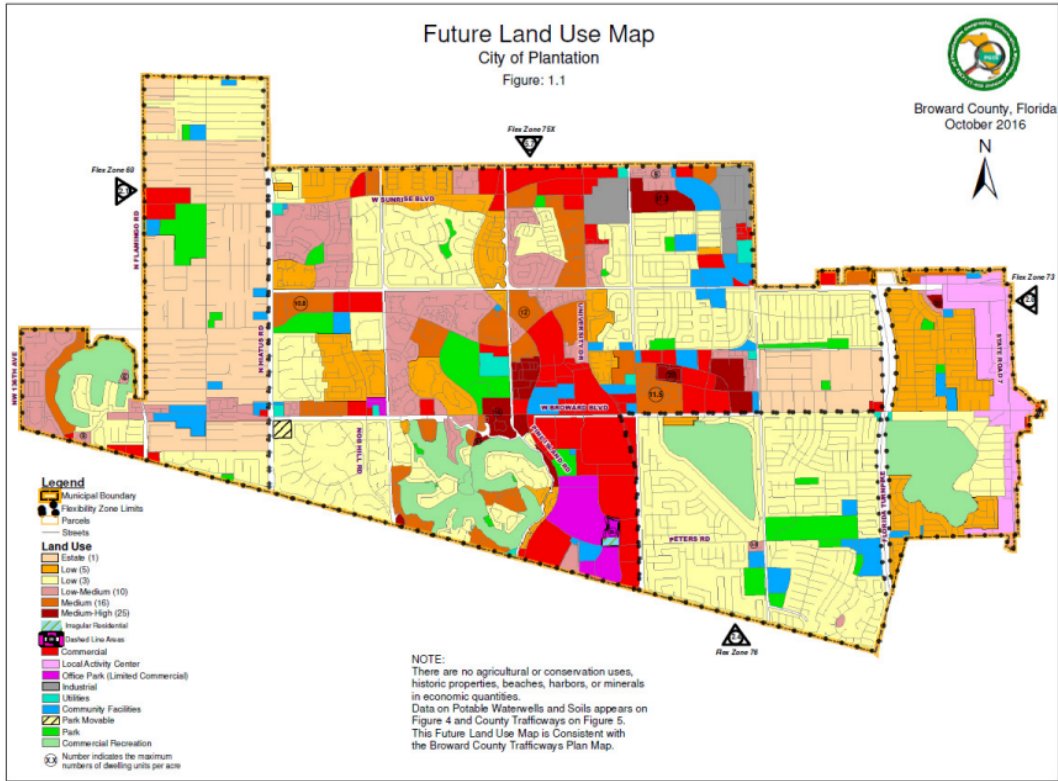


Figure 7-4. Future Land Use Map

7.2.3 Section 4(f)

The existing New River Greenway was constructed as part of the I-595 corridor and it is considered a transportation facility. There are no Section 4(f) properties within the limits of the project.

7.2.4 Cultural Resources

No previously recorded archaeological sites were located within the Area of Potential Effect (APE), nor within a one mile buffer encompassing the APE. No locally designated archaeological sites or zones are located within the APE or within one mile of the APE. No subsurface testing was possible within the archaeological APE due to the presence of existing roadways, sidewalks, bike path, parking lots, landscaping, and buried utilities. The desktop analysis and pedestrian survey determined that the archaeological APE exhibits a low potential for containing intact archaeological sites. Historical research and field survey resulted in the identification of one previously recorded historic linear resource, the North New River Canal (8BD3279). The portion of the North New River Canal (8BD3279) within the project APE has been determined National Register eligible numerous times, most recently in 2014 (Janus Research 2013). The current portion of the canal has not been altered since its most recent documentation and evaluation and maintains adequate integrity to express its association with the Everglades Drainage District. Therefore, the portion of the North New River Canal (8BD3279) within the current project APE is considered individually National Register eligible under Criterion A in the area of Community Planning and Development for its association with the development of South Florida.

7.2.5 Wetlands

Right of way acquisition/coordination will be required for any chosen bridge crossing alignment. The only surface water which will need to be addressed during permitting is the New River Canal.

Either chosen alignment is expected to have minimal impacts on the New River Canal. At most approximately 0.3 of surface water features could be impacted.

If storage and drainage facilities are required to support the project, additional review will be required.

7.2.6 Protected Species and Habitat

The project will not affect federal or state protected species. A review of literature for documented occurrences and listing of possible protected species was conducted in addition to field surveys for potential species.

The bald eagle is afforded federal protection through the MBTA and BGEPA. The USFWS regulates activities if an active eagle nest is within 660 feet of a proposed activity. Multiple avenues of protection will be employed to negate and minimize any potential affects to this species. Some of the measures employed will include BMPs during construction, adherence to FDOT's "Standard Specification for Road and Bridge Construction", and utilization of special provisions for the eastern indigo snake.

No adverse effect is anticipated for any state protected species, including wetland dependent avian

species.

7.2.7 Aesthetic Features

Within the project limits there is minimal existing landscape on site. The proposed bridge bisects the existing New River Greenway pedestrian trail. Given proximity to the canal, the majority of the site is existing turf with a few clusters of palms and a shade tree. Along SW 17th St. from the proposed improvements, multiple mature shade trees line the roadway, north of an existing sidewalk in the ROW. There are no forested areas, wildflower areas, special highway designations or Outdoor Advertisement Billboards.

As the project may affect some of the landscaping within the southern right of way of SW 17th St. due to sight line criteria. The proposed bridge should enhance the aesthetic value of the site through new landscaping solutions as a net gain to any reductions to do the improvements. The pathway for the New River Greenway will require modifications by the bridge implementation. No other impacts are expected. Found below is a rendering of the Proposed Landscape aesthetic for the preferred Alternative.

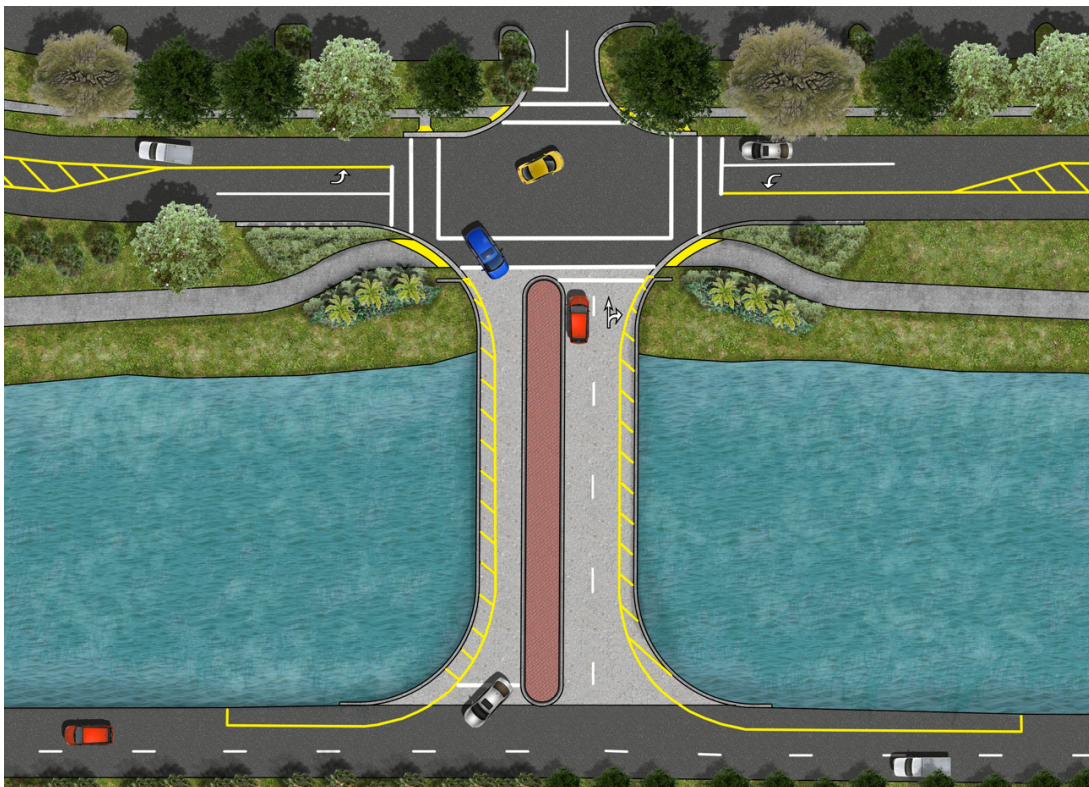


Figure 7-5. Proposed Landscape Aesthetic

7.2.8 Essential Fish Habitat

There is no involvement with, or adverse effect on Essential Fish Habitat (EFH) as the project area does not contain areas that support EFH or National Oceanic and Atmospheric Administration (NOAA) trust fishery resources; therefore, no EFH assessment or further consultation with National Marine Fisheries

Service (NMFS) will be required. An EFH Assessment is not required.

7.2.9 Highway Traffic Noise and Air Analysis

A separate NSR was prepared for this project. Based on the results on this screening analysis, the project will not cause an exceedance of the NAC for residential noise sensitive sites and a substantial noise level increase is not expected to occur. Also, the 67 dB(A) noise level isopleth from the local roadway network is not expected to extend beyond the roadway edge. Therefore, traffic noise from the planned improvements will not cause new traffic noise impacts.

Table 7-2. Estimated Traffic Noise Levels

Alternative	Plantation One Estimated Traffic Noise Level [dB(A)]	Distance to 67 dB(A) Noise Level Isopleth
Existing	46.9	At Edge-of-Pavement
Design Year (2045) No Build	48.1	
Design Year (2045) Build	53.2	

Notes: The estimated traffic noise level is due only to traffic from the local roadway network north of the New River Canal.

Regarding air quality the construction of the planned improvements could cause short-term impacts to air quality through airborne dust and other ambient air pollutants. These 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. Based on the results from the screening model, the highest project-related CO one-hour and eight-hour levels are not predicted to meet or exceed the one-hour or eight-hour NAAQS for this pollutant with either the No-Build or Build alternatives. As such, the project passes the screening model.

7.2.10 Contamination

Based on a review of Federal, State and local databases, there are no sites adjacent to or in the immediate vicinity of the alternative footprints that have been identified as having potential contamination concerns. From data gathered during further records reviews and site visits, there are no contamination sites within the footprint of the proposed alternatives, as outlined in the FDOT PD&E Manual, Chapter 20 Section 2.2.4. Reviews of all reasonably available information indicates contamination, including documented spills, leaks, soil or groundwater exposure, is not a problem at the time of this investigation, although continued monitoring is required. Field reviews did not result in the identification of potential sources of contamination or other signs of possible contamination that may indicate more assessments, interviews or investigations are needed at this time. Additional R/W acquisition will not result in additional contamination concerns.