

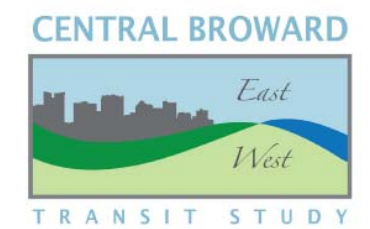
CENTRAL BROWARD EAST-WEST TRANSIT STUDY  
Locally Preferred Alternative Selection Report, Part I  
Environmental Screening and Evaluation Report



December 2012



**JACOBS**



This page left intentionally blank.

## Report Guide

### Purpose of the Environmental Screening and Evaluation Report

This document represents Part I of the Locally Preferred Alternative Selection Report. The purpose of the Environmental Screening and Evaluation Report, beyond fulfilling FTA and EPA requirements, is to minimize or avoid potential adverse environmental effects before they occur, identify potential benefits, and incorporate environmental (physical and social) factors into the decision-making process.

#### *Chapter 1: Introduction*

Introduces the Study's history and progress and defines the study area.

#### *Chapter 2: Purpose and Need*

Details the purpose of the Central Broward East-West Transit Study, which is to identify premium transit services that will provide mobility options, improving east-west travel in central Broward County.

#### *Chapter 3: Alternatives Considered*

Defines all alternatives considered, including the No Build Alternative, the Transportation Systems Management Alternative, and the three Build Alternatives.

#### *Chapter 4: Environmental Screening*

Examines the two-step approach taken to evaluate the environmental effects of the Build Alternatives, based on both the Efficient Transportation Decision Making (ETDM) Planning Screening process, as well as desktop and field review by the Study team to assess the general feasibility of each of the alternatives.

#### *Chapter 5: Public Comment and Agency Coordination*

Explains the level of communication with all stakeholders throughout the Study's history.

#### *Chapter 6: Evaluation of Alternatives*

Examines the evaluation criteria developed based on the FTA's New Starts Criteria, NEPA criteria, and the Study goals and objectives.

#### *Chapter 7: LPA Selection*

Reviews the final process in selection the Locally Preferred Alternative.

This page left intentionally blank.

# Table of Contents

Executive Summary.....	i	5.3 Public Outreach and Stakeholder/Agency Coordination.....	31
1.0 Introduction.....	8	5.4 Corridorwide Public Meetings.....	32
1.1 Study Area.....	8	6.0 Evaluation of Alternatives.....	33
1.2 Study Overview and History.....	8	6.1 Analysis.....	34
1.3 Regional Partnership in Decision Making.....	9	6.2 Conclusions.....	39
2.0 Purpose and Need.....	10	7.0 LPA Selection.....	40
2.1 Purpose of the Study.....	10		
2.2 Need for the Study.....	10		
2.3 Study Goals and Objectives.....	13		
2.4 Regional Context.....	14		
3.0 Alternatives Considered.....	16		
3.1 No Build Alternative.....	16		
3.2 Transportation Systems Management (TSM) Alternative.....	16		
3.3 Build Alternatives.....	18		
4.0 Environmental Screening.....	20		
4.1 Efficient Transportation Decision Making.....	20		
4.2 Neighborhoods and Community Facilities and Services.....	20		
4.3 Environmental Justice.....	20		
4.4 Acquisitions, Displacements, and Relocation.....	21		
4.5 Land Use and Economic Activity.....	21		
4.6 Parks, Recreation Land, and Open Space.....	24		
4.7 Visual and Aesthetics Quality.....	24		
4.8 Air Quality and Energy.....	25		
4.9 Noise and Vibration.....	25		
4.10 Hazardous/Regulated Materials.....	26		
4.11 Cultural Resources.....	26		
4.12 Ecosystems.....	27		
4.13 Water Resources.....	27		
4.14 Floodplains and Drainage.....	27		
4.15 Geological Resources.....	28		
4.16 Safety and Security.....	28		
4.17 Utilities.....	28		
4.18 Transportation Systems.....	29		
5.0 Public Comment and Agency Coordination.....	31		
5.1 Public Involvement Overview.....	31		
5.2 Outreach Tools.....	31		

List of Exhibits

Exhibit 1: Central Broward East-West Transit Study Area ..... 8

Exhibit 2: 2006 Adopted Locally Preferred Alternative ..... 9

Exhibit 3: 2010 Build Alternative..... 9

Exhibit 4: 2009 and 2035 I-595 V/C and LOS ..... 10

Exhibit 5: Study Area Activity Centers ..... 11

Exhibit 6: 2010 Statistics for Activity Centers ..... 11

Exhibit 7: Redistribution of V/C among all links from 2009 to 2035 ..... 13

Exhibit 8: Existing and Planned Transit Service Improvements ..... 16

Exhibit 9: Existing (2010) and Planned Transit Service Improvements Included in the TSM Alternative ..... 17

Exhibit 10: SR 7/Broward Boulevard Alternative ..... 18

Exhibit 11: Griffin Road Alternatives ..... 19

Exhibit 12: Existing Land Use Along the Griffin Road Alternatives ..... 22

Exhibit 13: Existing Land Use Along the SR 7/Broward Boulevard Alternative..... 22

Exhibit 14: Future Land Use along the Griffin Road Alignment..... 23

Exhibit 15: Future Land Use along the SR 7/Broward Boulevard..... 23

Exhibit 16: Adjacent Parks, Recreation Land, and Open Spaces ..... 24

Exhibit 17: Quarter-Mile Area of Potential Effect ..... 24

Exhibit 18: Cultural Resources ..... 26

Exhibit 19: Study Goals and Corresponding Performance Measures ..... 33

Exhibit 20: 2035 Projected Daily Boardings ..... 34

Exhibit 21: 2035 Projected Annual Boardings ..... 34

Exhibit 22: 2035 Projected Daily Transit Dependent Boardings..... 34

Exhibit 23: 2035 Estimated Travel Times Between Key Destinations or Activity Centers ..... 34

Exhibit 24: 2035 Change in System wide VMT Compared to No Build Alternative..... 35

Exhibit 25: Capital Cost Estimates in Year 2010 Dollars..... 35

Exhibit 26: Annualized Capital Cost Estimates in Year 2010 Dollars ..... 35

Exhibit 27: Capital Cost Per Mile in Year 2010 Dollars ..... 35

Exhibit 28: Capital Cost Per Fixed Guideway Mile in Year 2010 Dollars ..... 35

Exhibit 29: Capital Cost Per Boarding in Year 2010 Dollars ..... 36

Exhibit 30: Capital Cost Per Passenger Mile in Year 2010 Dollars ..... 36

Exhibit 31: Annual Operating & Maintenance Cost in Year 2010 Dollars ..... 36

Exhibit 32: Annual Operating & Maintenance Cost per Boarding in Year 2010 Dollars..... 36

Exhibit 33: Annual Operating & Maintenance Cost per Passenger Mile in Year 2010 Dollars ..... 36

Exhibit 34: Estimated New Starts Overall Land Use Rating ..... 37

Exhibit 35: 2010 Population within Half-Mile of Proposed Stations ..... 37

Exhibit 36: 2035 Projected Population within Half-Mile of Proposed Stations ..... 37

Exhibit 37: 2010 Existing Jobs within Half-Mile of Proposed Stations ..... 38

Exhibit 38: 2035 Projected Jobs within Half-Mile of Proposed Stations ..... 38

Exhibit 39: 2010 Existing Students within Half-Mile of Proposed Stations ..... 38

Exhibit 40: 2035 Projected Students within Half-Mile of Proposed Stations ..... 38

Exhibit 41: Potential for Impacts to Natural Resources ..... 38

Exhibit 42: Evaluation of Alternatives Summary Table ..... 39

Exhibit 43: Locally Preferred Alternative ..... 40

Exhibit 44: Decision Matrix ..... 40

## List of Appendices

Appendix A: Memorandum of Understanding

Appendix B: Public Outreach and Agency Coordination Meetings List

## List of Abbreviations

AA	Alternatives Analysis	TAG	Technical Advisory Group
AADT	Annual Average Daily Traffic	TDP	Transit Development Plan
ADA	Americans with Disabilities Act	TIP	Transportation Improvement Program
APE	Area of Potential Effect	TSM	Transportation System Management
BCT	Broward County Transit	VMT	Vehicle Miles Traveled
BFE	Base Flood Elevation		
BRT	Bus Rapid Transit		
CBD	Central Business District		
CBT	Central Broward Transit		
CO2	Carbon Monoxide		
EIS	Environmental Impact Statement		
EJ	Environmental Justice		
EPA	Environmental Protection Agency		
ETDM	Efficient Transportation Decision Making		
FDOT	Florida Department of Transportation		
FEC	Florida East Coast (Railway)		
FEMA	Federal Emergency Management Agency		
FHWA	Federal Highway Administration		
FLL	Fort Lauderdale-Hollywood International Airport		
FTA	Federal Transit Administration		
LOS	Level of Service		
LPA	Locally Preferred Alternative		
L RTP	Long Range Transportation Plan		
MOE	Measure of Effectiveness		
MOU	Memorandum of Understanding		
MPO	Metropolitan Planning Organization		
NAAQS	National Ambient Air Quality Standards		
NEPA	National Environmental Policy Act		
RAC	Regional Activity Center		
SERPM	Southeast Florida Regional Planning Model		
SFEC	South Florida Education Center		
SFRC	South Florida Rail Corridor		
SFRTA	South Florida Regional Transit Authority		



## Executive Summary

The Florida Department of Transportation (FDOT), Broward County Transit (BCT), the Broward Metropolitan Planning Organization (MPO), and the South Florida Regional Transportation Authority (SFRTA), in cooperation with the Federal Transit Administration (FTA), are evaluating potential transit options in central Broward County through the Central Broward East-West Transit Study (CBT). The purpose of this document is to describe the process for determining the Locally Preferred Alternative (LPA). The alternatives were reviewed and compared based on their potential benefits and effects. The LPA was identified through technical analysis and public involvement.

The CBT study area covers the central portion of Broward County, from Oakland Park Boulevard south to Griffin Road and Stirling Road, and from the I-75/Sawgrass/Weston area east to the Intracoastal Waterway, as shown in Exhibit ES-1. There are six activity centers included in the study area that offer retail, employment, recreation, and educational opportunities. These activity centers are also shown on Exhibit ES-2. These areas were designated as activity centers based on a combination of the land uses (existing and planned) and the daily number of trips generated.

Exhibit ES-1: CBT Study Area

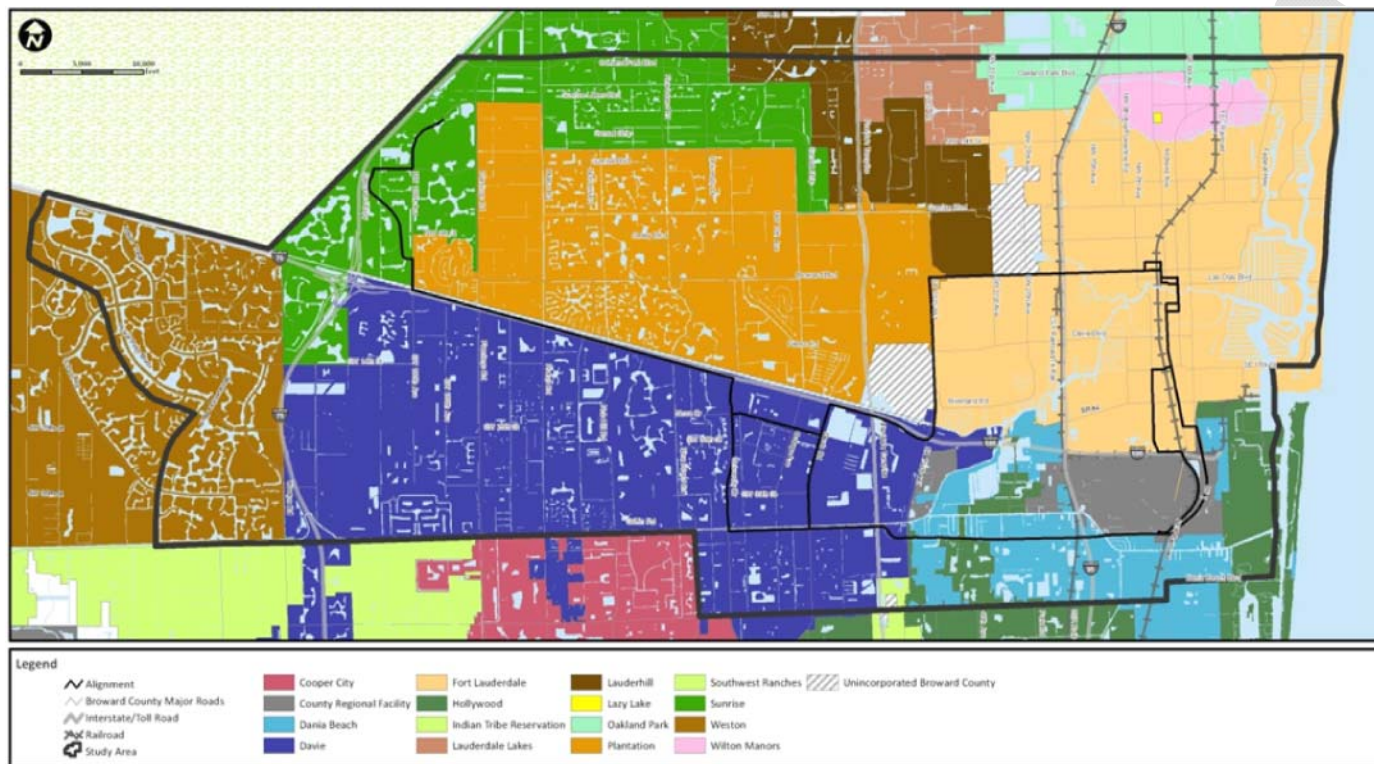
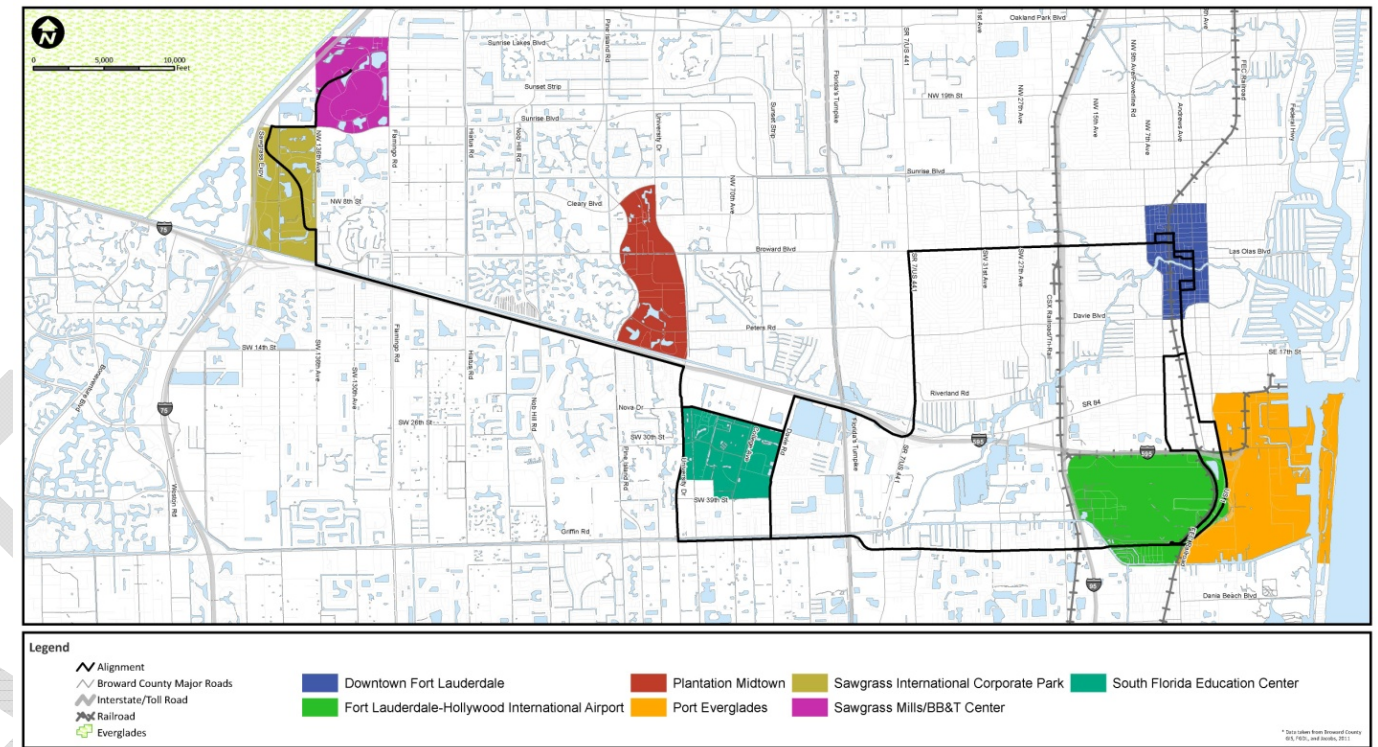


Exhibit ES-2: Activity Centers within the Study Area



The Central Broward East-West Transit Study began in 2002 with an Alternatives Analysis (AA). Since the AA was conducted, an LPA for the Study was adopted in 2005, amended and adopted again in 2006 as shown in Exhibit ES-3. In September 2008, the Federal FTA published a Notice of Intent to conduct a Draft Environmental Impact Statement (EIS) in the Federal Register. Scoping for the Draft EIS occurred in late September 2008. In 2010, a preferred Build Alternative was identified based on input from the public, the Technical Advisory Group (TAG), and coordinating agencies. The 2010 Build Alternative consisted of Bus Rapid Transit (BRT) and Modern Streetcar which was to be assessed along the entire 22-mile alignment extending from Sawgrass Mills in the west to the Fort Lauderdale-Hollywood International Airport in the east as depicted in Exhibit ES-4.

On direction from the Broward MPO in June 2010, the FDOT convened the partner transportation agencies (BCT, SFRTA, and the MPO) to reconsider the Build Alternatives, based on the range of options reviewed during Scoping in 2008 and 2009. Two alignments were identified for continued evaluation and presented to the Broward MPO in October 2010. The Broward MPO endorsed the alignments and confirmed their desire to continue with the Study. Following consultation with FTA in June 2011, it was determined that a new LPA was required prior to the completion of the National Environmental Policy Act (NEPA) process.



Exhibit ES-3: 2006 LPA Alignment

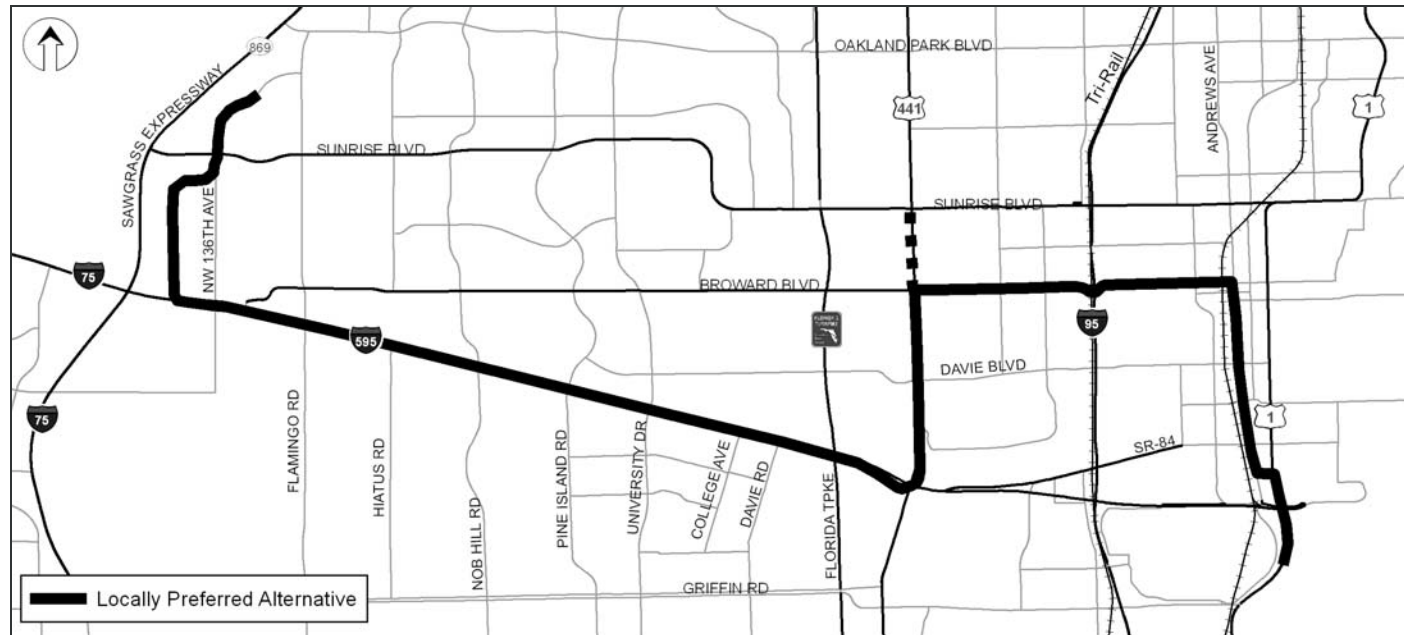
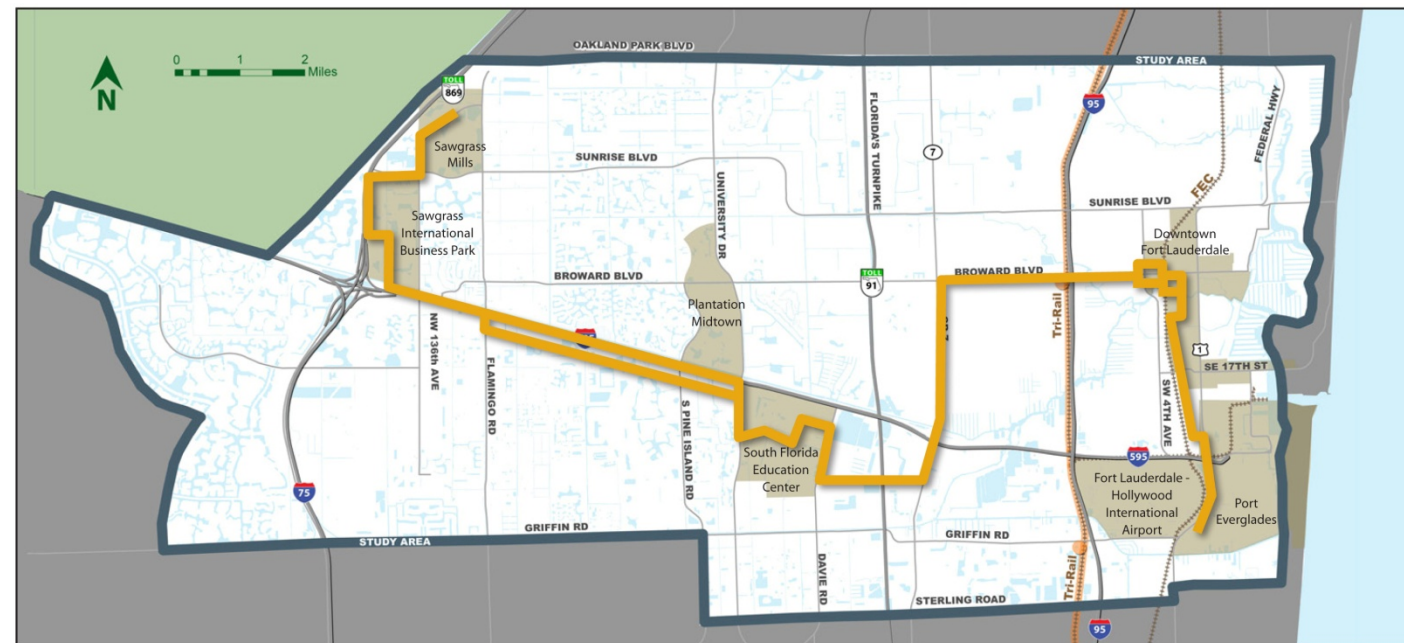


Exhibit ES-4: 2012 Build Alternative



### Purpose and Need

The purpose of the Central Broward East-West Transit Study is to identify premium transit services that will provide mobility options, improving east-west travel in central Broward County. The Broward County east-west travel market faces roadway congestion, increased growth with limited capacity, and limited transit service options. Five specific needs are identified as follows.

- **Limited Capacity on East-West Roadways:** The Central Broward East-West Transit Study considers east-west travel alternatives to alleviate the currently congested and constrained I-595. I-595 is the only east-west limited access freeway serving the majority of travel demand in the corridor, with more than 185,000 vehicle trips a day. Travel demand on I-595 is expected to exceed 230,000 vehicles per day by 2035. The Master Plan for the corridor includes the addition of tolled reversible express lanes which will consume the remaining right-of-way, yet will not meet the anticipated traffic demand. Additionally, the local roads in the Fort Lauderdale area cannot be expanded to accommodate projected growth without extensive property acquisitions and community impacts.
- **Rapid Population and Employment Growth:** Broward County’s population is expected to grow from 1.7 million to 2.3 million, adding 29 percent more residents, and 37 percent more jobs from 0.7 to 1.0 million by 2035. In 2010, Broward County was the 18th most populous county in the country, with almost two-thirds of the county’s land area consisting of an Everglades Conservation area. Population density in central Broward County is also projected to grow by 25 percent more than the countywide average by 2035. While growth is anticipated throughout the Study area, it is projected to concentrate in the activity centers furthering the need to accommodate east-west travel. Trips to the activity centers, the largest trip generators in Broward County, are mostly dependent upon automobiles for access. (Broward MPO LRTP, December 2009 & Amended April 12, 2012).
- **Limited Connections to Activity Centers in the County:** Broward County’s largest trip generators are located in the study area, as shown in Exhibit ES-2. Many of these activity centers rely on future premium transit improvements, and the Central Broward East-West Transit Study alternatives specifically, to provide access to jobs, entertainment, and residences proposed in their plans. Premium transit improvements are expected to help provide the economic vitality and sustainability that are part of Broward County’s vision.
- **Increased Travel Demand and Congestion:** The combination of the limited capacity of roadways and the projected population and employment growth will continue to result in high levels of travel and congestion in the study area. In 2009, 23 percent of the east-west arterial roadway segments and 81 percent of I-595 segments operated at levels of service E or F. In 2035, while I-595 is projected to improve due to the addition of three reversible managed lanes, the percentage of east-west arterial segments that are projected to fail will rise to 45 percent.
- **Limited Transit Service:** East-west transit within the study area is currently served by BCT with local fixed service routes and community bus services. Current transit services operate in mixed traffic, and therefore transit service is subject to the congestion delays experienced by automobile traffic. The local nature of the bus service also increases travel times due to frequent stops.

The Study goals are:

- **Travel and Mobility Goal:** Provide a premium transit improvement that enhances east-west mobility in central Broward County.
- **Financial Goal:** Provide a premium transit improvement that most efficiently uses available financial resources.
- **Economic Goal:** Provide a premium transit improvement that supports economic growth and development.
- **Community Goal:** Provide a premium transit improvement that is consistent with the needs and desires of the residents of Broward County, in order to maximize community acceptance and support.



- **Land Use Goal:** Provide a premium transit improvement that ensures compatibility between land use policies and transit service so that the need for vehicular trip-making and the amount of vehicular travel is reduced and the opportunities for transit-oriented development are maximized.
- **Environmental Goal:** Provide a premium transit improvement that enhances and preserves the social and physical environment, and that keeps potential impacts to sensitive resources to a minimum.

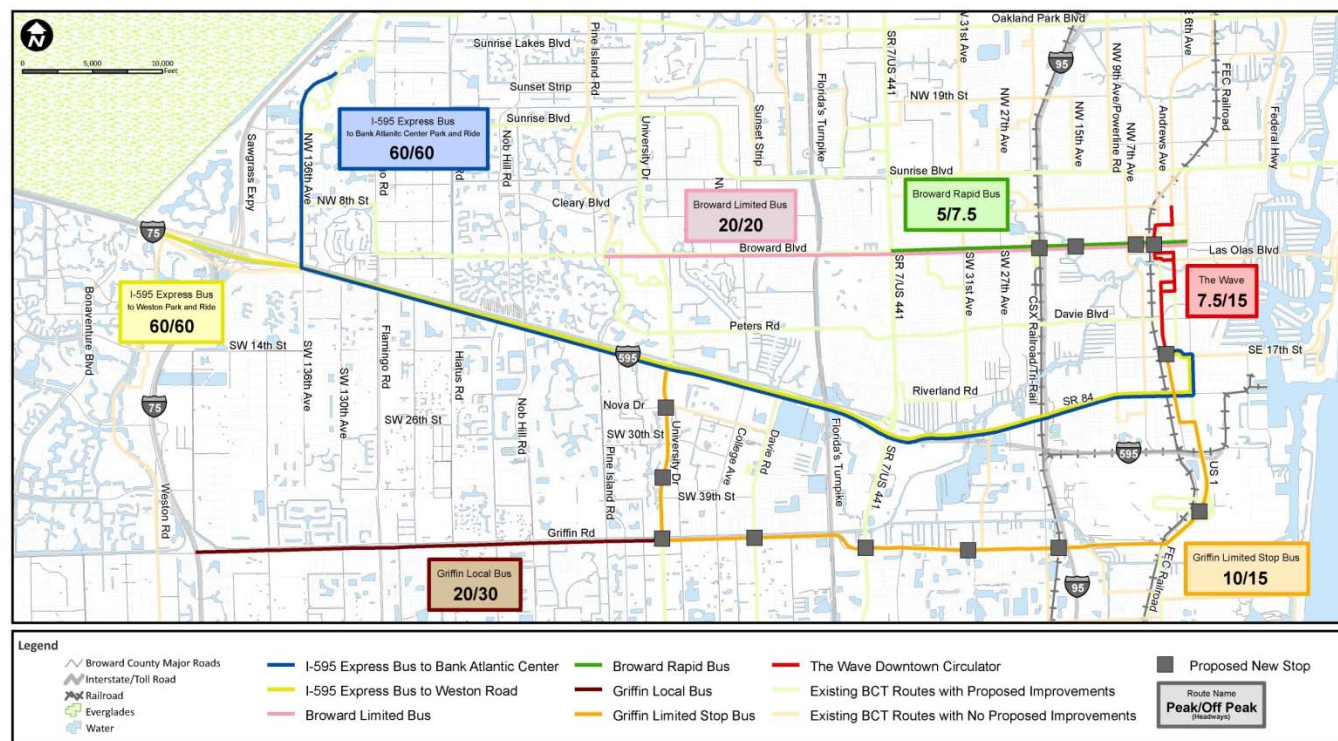
### Alternatives Considered

The evaluation considered a No Build, a Transportation System Management (TSM), and three Build Alternatives. Each of these alternatives is summarized below.

**No Build Alternative:** The Broward MPO’s financially constrained long range plan, the 2035 Cost Feasible LRTP, was used to define the No Build Alternative. The 2035 Cost Feasible LRTP consists of all existing and committed (planned, with funding, but not yet under construction) projects, including transit elements. The 2035 Cost Feasible Plan also includes four illustrative projects; one is an alignment for the Central Broward East-West Transit Study. For the purposes of this Study, the No Build Alternative does not include the illustrative projects.

**TSM Alternative:** The proposed TSM Alternative for this Study was developed in consultation with staff members from Broward County Transit, the Broward MPO and FDOT District Four, and includes the No Build Alternative; Wave streetcar project, identified as an illustrative project in the 2035 LRTP; modifications to several planned route headways; and additional limited stop bus service. Exhibit ES-5 shows the services included in the TSM.

**Exhibit ES-5: Existing and Planned Transit Service Improvements**



**Build Alternatives:** Two alignments were considered, of which the eastern and western portions are identical. The western portion of the alternatives is from the BB&T Center/Sawgrass Mills Mall to University Drive, and considers

premium bus exclusively. The eastern portion of the alternatives is east of the Broward Boulevard and Griffin Road Tri-Rail stations providing connections from these stations to downtown Fort Lauderdale and the Fort Lauderdale – Hollywood International Airport, and considers modern streetcar exclusively. The central portions vary in terms of both alignment and mode, and are used to reference the alternatives. For the SR 7/Broward Boulevard alignment, only premium bus was considered as the mode along the unique, central segment. A Premium Bus Alternative and a Modern Streetcar Alternative were considered along the same Griffin Road alignment, making three total Build Alternatives:

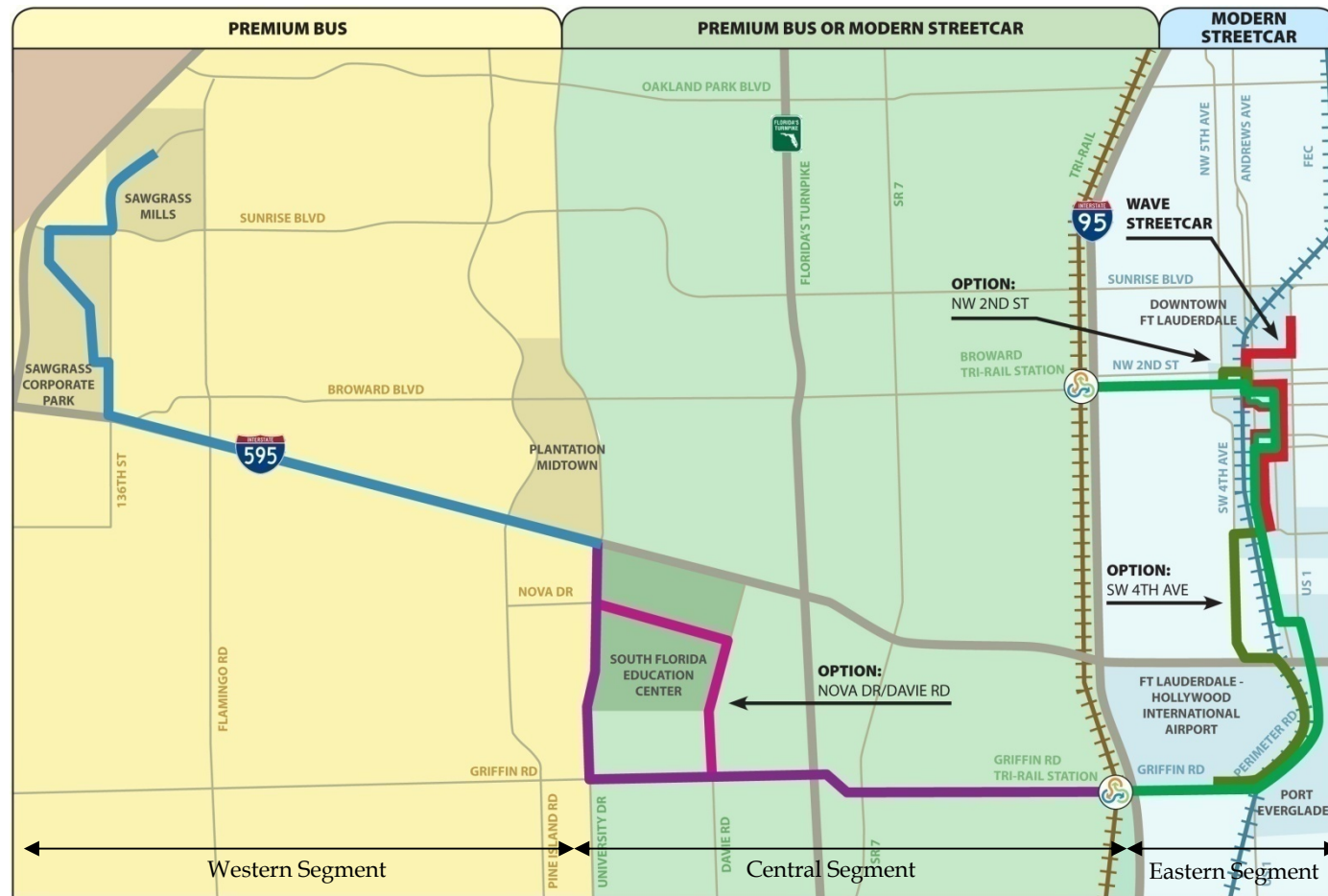
- SR 7/Broward Boulevard Alternative (Premium Bus), shown in Exhibit ES-6
- Griffin Road Premium Bus, shown in Exhibit ES-7
- Griffin Road Modern Streetcar Alternative, also shown in Exhibit ES-7

Due to the similarity of western and eastern portions of the alignments, to determine the LPA, this document focuses on the central portions of the alignments. For the sake of simplicity, different options associated with each of the build alternatives were not taken into account separately unless otherwise noted. For the purposes of this analysis, all possible options associated with each alignment were considered to be a part of that alignment. Once an LPA is selected, the options associated with that alternative will be further evaluated during the NEPA phase.

**Exhibit ES-6: Build Alternative on SR 7/Broward Boulevard**



### Exhibit ES-7: Build Alternatives on Griffin Road Alternatives



overhead catenary system required for the modern streetcar, which could introduce additional poles and wires along the alignment and (2) potential for wheel squeal at turns. Both of these potential impacts can be addressed through engineering and design.

### Public Outreach

The Central Broward East-West Transit Study has implemented a continuous and comprehensive Public Involvement Program including public outreach initiatives as well as stakeholder and agency coordination. From April 2008 to June 2010, the Program focused on initially developed alternatives that were since updated by the Broward MPO which is documented in the Interim Conceptual Design Report. Once the Broward MPO adopted a new approach to the Study in June 2010, focusing on the SR 7/Broward Boulevard and Griffin Road alignments, the Study team used a variety of methods to provide project information to the stakeholders and public, and the opportunity to ask questions and offer comments. The Program included traditional public outreach methods such as public meetings/workshops, agency and stakeholder coordination, newsletters and a study website. To enhance outreach efforts non-traditional methods, such as attending homeowner association meetings, distributing flyers and meeting notices via door hangers in rental communities or at local businesses along the alignments, and coordination with local churches were also used. In general, the public is supportive of improved transit in the study area and there is not a strong preference for one alternative over the other. The City of Dania Beach adopted a resolution in support of the Griffin Road Modern Streetcar Alternative.

### Environmental Screening

A two-step approach was taken to the environmental screening of the Build Alternatives. The first step was to complete the Efficient Transportation Decision Making (ETDM) Planning Screen. This allowed for a desktop review of and comment on the potential effects to a variety of natural and manmade resources by the local, state, and federal agencies that have jurisdiction over these resources. The second step was a combined desktop and field review by the Study team to assess the general feasibility of each of the alternatives.

The results of the ETDM Planning Screen were similar for the three Build Alternatives. Each was determined to be likely to have minimal to no effects in most of the resource areas, with the exception of infrastructure, historic/archaeological sites, and wetlands. Each of the alternatives were rated the same for their potential effects in these areas: moderate for infrastructure and wetlands and substantial for historic/archaeological sites. Thus, the ETDM screening did not provide a distinction between the Build Alternatives in terms of their potential for effects.

The results of the Study team’s desktop review and field evaluations yielded similar results to the ETDM screening. In fact, the only areas that provide any significant differentiation between the alternatives are visual/aesthetic conditions and noise/vibration impacts. The sole reason for this difference is the vehicle, the modern streetcar, which makes the Griffin Road Modern Streetcar Alternative have a slightly higher potential for impacts on the adjacent communities. The two reasons for these potential impacts are the (1) presence of the



## Evaluation of Alternatives

A set of evaluation criteria were developed based on the FTA’s New Starts Criteria, NEPA criteria, and the Study goals and objectives. Where possible, the specific measures were matched to those required by the Section 5309 New Starts Criteria, including proposed changes identified in the January 25, 2012, Federal Transit Administration Notice of Proposed Rule Making. Additional evaluation measures to ensure local interests were addressed were identified through coordination with the Technical Advisory Group and Executive Committee. Those criteria that reflected key local interests or that helped to provide a distinction between the alternatives were specifically identified as LPA Measures as they helped the Broward MPO Board Members to make a decision regarding the LPA.

Exhibit ES-8 identifies the evaluation criteria used, including those identified as LPA Measures, and correlates these with the Study goals.

Exhibit ES-9 provides the results of the evaluation in a single table for comparative purposes. When the alternatives are considered in a side-by-side evaluation, the greatest differences are seen in the following performance measures.

1. **Projected Boardings.** The Griffin Road Modern Streetcar Alternative has the highest number of projected boardings (daily and annual), whereas the SR 7/Broward Boulevard Alternative and Griffin Road Premium Bus Alternative have similar projections.
2. **Capital Costs.** The SR 7/Broward Boulevard Alternative is the less expensive of the build alternatives.
3. **Operating & Maintenance Costs.** Both the SR 7/Broward Boulevard and Griffin Road Premium Bus Alternatives have similar projected operating costs, while the Griffin Road Modern Streetcar Alternative is projected to cost \$1 million more than the bus alternatives. However, when considering the operating and maintenance cost per boarding, the Griffin Road Modern Streetcar Alternative shows better efficiency.
4. **Number of Jobs.** The Griffin Road alignment has the potential of providing access to a larger number of jobs based on its routing around the South Florida Education Center and the ability to provide more stations in this area as compared to the SR 7/Broward Alternative, as well as its proximity to the employment area located adjacent to Florida’s Turnpike, north of Griffin Road.
5. **Number of Students.** The Griffin Road alignment also offers better access to educational opportunities because of its routing around the South Florida Education Center.

Given that the evaluation results were so similar for the Build Alternatives, the LPA decision was based on the following factors: projected boardings, projected number of jobs and students near potential stations, and operating and maintenance cost per boarding. While the SR 7/Broward Boulevard Alternative provides a more cost-effective solution, it does not offer the same potential for economic development that has been shown to follow investments in fixed guideway transit. The community leaders decided that this potential for economic development is worth the additional financial investment associated with the Griffin Road Modern Streetcar Alternative. It was also decided that an investment in modern streetcar would attract more choice riders and make Broward County more competitive in the national market.

Exhibit ES-8: Project Goals and Corresponding Performance Measures

Goals	Performance Measure	LPA Measure
<b>Travel and Mobility: Enhance east-west mobility in central Broward County.</b>	Projected daily boardings in the year 2035	Yes
	Projected annual boardings in the year 2035	Yes
	Number of daily transit dependent boardings in the year 2035	Yes
	Travel times between key destinations or activity centers	Yes
	Change in system-wide Year 2035 Vehicle Miles Traveled compared to No Build	No
<b>Financial and Economic: Most efficiently use available financial resources, and support economic growth and development.</b>	Estimated capital cost	Yes
	Estimated annualized capital cost	No
	Estimated capital cost per mile	Yes
	Estimated capital cost per fixed guideway mile	No
	Estimated annualized capital cost per boarding	Yes
	Estimated annualized capital cost per passenger mile	No
	Estimated annual operating & maintenance cost (not including the background bus network)	Yes
	Estimated annual operating & maintenance cost per boarding	Yes
	Estimated annual operating & maintenance cost per passenger mile	Yes
	Economic development potential based on number of Regional Activity Centers, Local Activity Centers, and Community Redevelopment Areas served	No
	Annualized system-wide fare box recovery	No
	Fare box recovery as a percentage of project annual operating & maintenance costs	No
<b>Community: Be consistent with the needs and desires of the residents of Broward County, in order to maximize community acceptance and support.</b>	Expressed community support for the alternative based on comments during community meetings or official resolutions	No
	Right-of-Way/Acquisition required	Yes
<b>Land Use: Ensure compatibility between land use policies and transit service so that the need for trip-making and the amount of travel is reduced and the opportunities for transit-oriented development are maximized.</b>	Estimated New Starts Overall Land Use Rating	Yes
	2010 number of people within half-mile of potential stations	No
	2035 number of people within half-mile of potential stations	Yes
	2010 number of jobs within half-mile of potential stations	No
	2035 number of jobs within half-mile of potential stations	Yes
	2010 number of students within half-mile of potential stations	No
2035 number of students within half-mile of potential stations	Yes	
<b>Environmental: Enhance and preserve the social and physical environment, and keep potential impacts to sensitive resources to a minimum.</b>	Effects to natural resources based on ETDM Summary Report	Yes



**Exhibit ES-9: Evaluation of Alternatives Summary Table**

Performance Measure	TSM	SR 7/ Broward Blvd	Griffin Road	
			Majority Premium Bus	Majority Streetcar
Number of Daily Transit Boardings (Year 2035)	6,000	8,700	7,900	11,300
Projected Annual Transit Boardings (Year 2035)	1,800,000	2,610,000	2,370,000	3,390,000
Number of Daily Transit Dependent Boardings	n/a	1,600	1,617	2,100
Travel times				
<i>Sawgrass to Downtown</i>	n/a	43 minutes	52 minutes	
<i>Sawgrass to Airport</i>	n/a	62 minutes	37 minutes	
<i>Sawgrass to SFEC</i>	n/a	18 minutes	18 minutes	
<i>SFEC to Downtown</i>	n/a	25 minutes	34 minutes	
<i>SFEC to Airport</i>	n/a	44 minutes	19 minutes	
<i>SFEC to Griffin Road Tri-Rail</i>	n/a	48 minutes	16 minutes	
<i>Downtown to Broward Tri-Rail</i>	n/a	6 minutes	4 minutes	
Change in Systemwide VMT from No Build	0	(27,340)	(26,530)	
Estimated Capital Cost (millions)	\$40.3 M	\$273.9 M	\$324.7 M	\$466.6 M
Annualized Capital Cost (millions)	\$3.8 M	\$23.5 M	\$27.9 M	\$40.0 M
Estimated Capital Cost per Mile (millions)	n/a	\$9.5 M	\$12.8 M	\$18.4 M
Estimated Capital Cost per Fixed Guideway Mile (millions)	\$0.00	\$42.8 M	\$23.7 M	\$34.1 M
Estimated Annualized Capital Cost per Boarding	\$2.10	\$9.00	\$11.75	\$11.80
Estimated Annualized Capital Cost per Passenger Mile	n/a	\$2.05	\$2.60	\$2.20
Estimated Annual O&M Cost (millions)	\$6.6 M	\$6.7 M	\$6.6 M	\$7.6 M
Estimated O&M Cost per Boarding	\$3.65	\$2.55	\$2.80	\$2.25
Estimated O&M Cost per Passenger Mile	n/a	\$1.70	\$1.60	\$2.40
Community Support	n/a	Yes	Yes	
Right-of-Way/Acquisition Required	None	Minimal	Minimal	
Estimated New Starts Overall Land Use Rating	n/a	Medium Low	Medium	
2010 number of people within half-mile of potential stations	n/a	40,000	39,500	
2035 number of people within half-mile of potential stations (includes Wave stations)	n/a	75,400	73,900	
2010 number of jobs within half-mile of potential stations	n/a	36,000	49,000	
2035 number of jobs within half-mile of potential stations (includes Wave stations)	n/a	72,700	87,900	
2010 number of students within half-mile of potential stations	n/a	21,500	38,500	
2035 number of students within half-mile of potential stations (includes Wave stations)	n/a	29,000	55,000	
Potential Impacts to Natural Resources	None	Minimal	Minimal	

### LPA Selection

Following the public meetings in early April 2012, the Study team made presentations about the evaluation and public meeting results to the Broward MPO Board and its committees. The Technical Coordination Committee and Community Involvement Roundtable took action on the study during their May meetings. Both of the committees recommended to the Broward MPO Board that the Griffin Road Modern Streetcar Alternative be selected as the LPA. Presentations to the Broward MPO Board were made in May, July, and October. At the October 11, 2012 meeting, the Broward MPO adopted the Griffin Road Modern Streetcar Alternative, as shown in Exhibit ES-10, as the LPA for the Study. The MPO Board and its committees also stated that there is a greater potential for economic development and ability to attract choice riders with the modern streetcar technology. As shown in Exhibit ES-11, in concurrence with the MPO Board’s opinion, this decision was based on the higher number of projected boardings, larger numbers of jobs and students near potential stations, and the lower operating and maintenance cost per boarding.

Exhibit ES-10: Locally Preferred Alternative

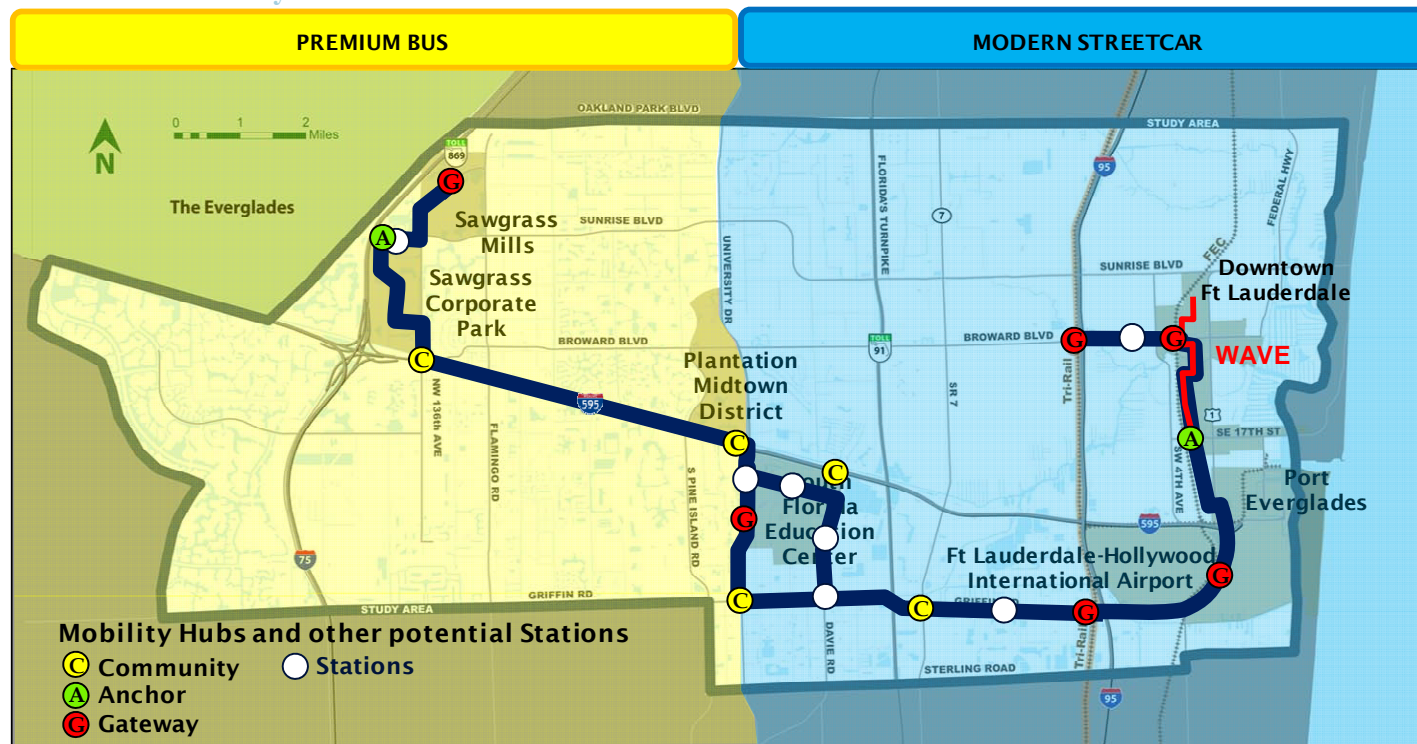


Exhibit ES-11: LPA Decision Factors

Performance Measure	TSM	SR 7/ Broward Boulevard	Griffin Road	
			Premium Bus	Modern Streetcar
2035 Daily Transit Boardings	6,000	8,700	7,900	11,300
2035 Annual Transit Boardings	1,800,000	2,610,000	2,370,000	3,390,000
Estimated Capital Costs	\$40.3 M	\$273.9 M	\$324.7 M	\$466.6 M
Annual O&M Costs	\$6.6 M	\$6.7 M	\$6.6 M	\$7.6 M
O&M Cost per Boarding	\$3.65	\$2.55	\$2.80	\$2.25
Community Support	N/A	Yes	Yes	Yes
Potential Impacts to Natural Resources	None	Minimal	Minimal	Minimal
Estimated New Starts Overall Land Use Rating	N/A	Medium Low	Medium	Medium
Potential Traffic Impacts	N/A	AM peak travel time savings	AM (both directions) & PM (eastbound only) peak travel time savings	AM (both directions) & PM (eastbound only) peak travel time savings
2010 Population Near Stations	N/A	40,000	39,500	39,500
2035 Population Near Stations	N/A	75,400	73,900	73,900
2010 Jobs Near Stations	N/A	36,000	49,000	49,000
2035 Jobs Near Stations	N/A	72,700	87,900	87,900
2010 Students Near Stations	N/A	21,500	38,500	38,500
2035 Students Near Stations	N/A	29,000	55,000	55,000

Key: Cells with orange shading indicate the alternative that ranked higher for that performance measure.



## 1.0 Introduction

Broward County has experienced tremendous growth in both population and jobs over the past decades. The county is projected to grow by approximately 30 percent in both population and jobs by the year 2035. Accompanying this growth will be an increase in traffic congestion on the region’s roadways. As congestion worsens and fuel prices fluctuate, it becomes more important to have travel choices. To respond to these issues, the Florida Department of Transportation (FDOT), Broward County Transit (BCT), the Broward Metropolitan Planning Organization (MPO), and the South Florida Regional Transportation Authority (SFRTA), in cooperation with the Federal Transit Administration (FTA), initiated the evaluation of potential transit options in Central Broward County.

The Central Broward East-West Transit Study Locally Preferred Alternative (LPA) report summarizes the results of refining the east-west corridor alternatives. The report provides a description and comparison of the corridors and existing conditions of the alternatives; provides a comparison of each of the alternatives to the Transportation System Management (TSM) Alternative; reviews the public comments and agency coordination; and outlines the results and recommendations from the Study.

The purpose of this document is to describe the process in determining the Preferred Alternative as part of the Central Broward East-West Transit Study. The alternatives were reviewed and compared based on their potential benefits and effects. The Study identified the preferred east-west alignment and technology through technical analysis and public involvement.

### 1.1 Study Area

As shown in Exhibit 1, the study area covers the central portion of the county. The total area within the project limits is 134 square miles, comprising about one third of the developable portion of Broward County. As of 2010, 536,500 people were living in the study area, making up 31 percent of the county’s total population of 1.75 million people. The study area includes Cooper City, Dania Beach, Davie, Fort Lauderdale, Hollywood, Lauderdale Lakes, Lauderhill, Lazy Lake, Oakland Park, Plantation, Southwest Ranches, Sunrise, Weston, Wilton Manors, and several unincorporated areas of Broward County. Six activity centers are located in the study area, offering retail, employment, recreation, and educational opportunities.

### 1.2 Study Overview and History

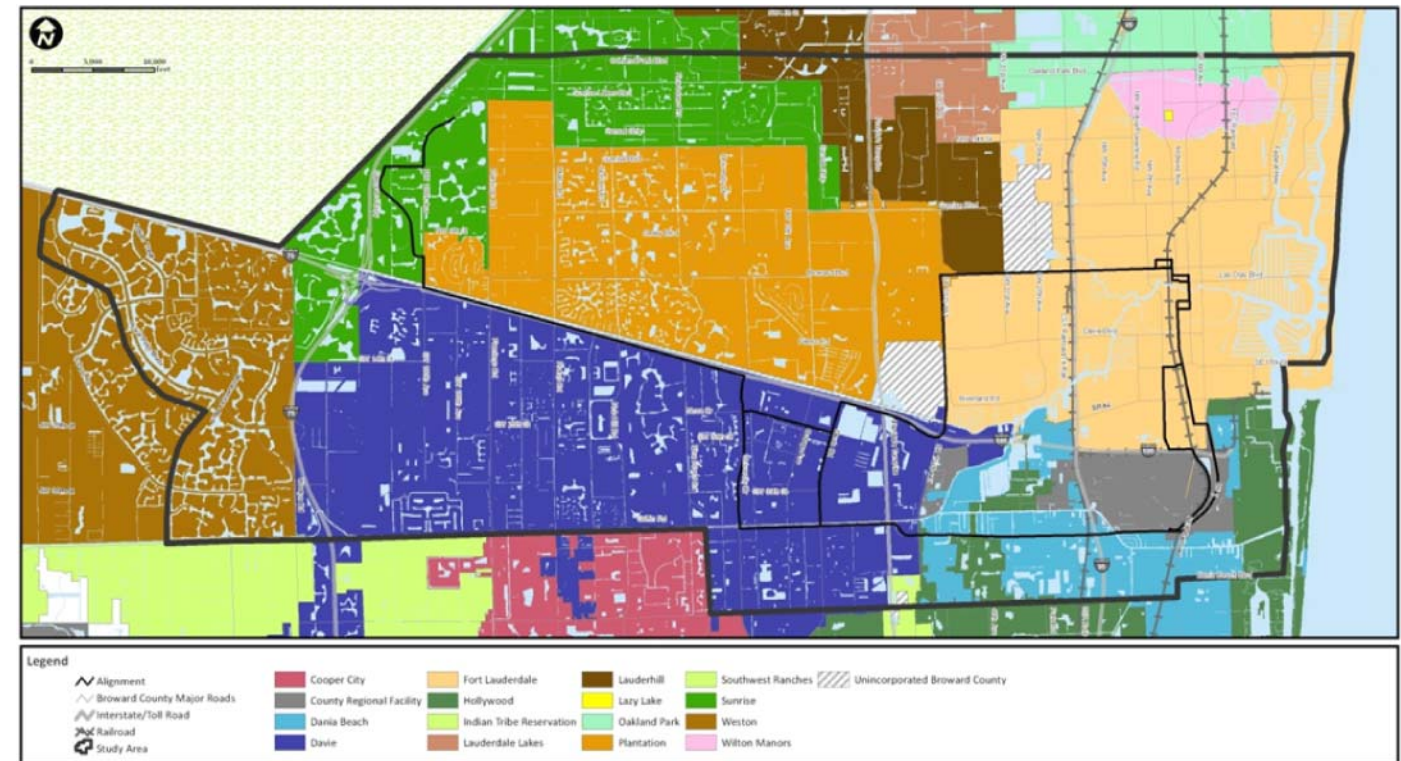
The Central Broward East-West Transit Study began in 2002 with an Alternatives Analysis (AA). Since the AA was completed in 2005, an LPA for the Study was adopted, amended and adopted again in 2006, as shown in Exhibit 2.

In September 2008, FTA published a Notice of Intent to conduct a Draft Environmental Impact Statement (EIS) in the Federal Register. Although included in the 2025 and 2030 Long Range Transportation Plans (LRTPs), the Study is currently incorporated as an “Illustrative Project” in the 2035 Cost Feasible LRTP which was adopted by the Broward MPO in December 2009. Illustrative Projects are defined in the plan to be next in line for funds that may become available and this status establishes their priority and relative scoring. A plan amendment to include the Study in the 2035 Cost Feasible LRTP would be made if the Study is advanced into implementation.

Scoping for the Draft EIS occurred in late September 2008 when a Technical Advisory Group (TAG) was formed. In 2010, a preferred Build Alternative was identified based on input from the public, the TAG and, coordinating agencies. The 2010 Build Alternative consisted of Bus Rapid Transit (BRT) and Modern Streetcar which was to be

assessed along the entire 22-mile alignment extending from Sawgrass Mills in the west to the Fort Lauderdale-Hollywood International Airport in the east as depicted in Exhibit 3. On August 30, 2010, FDOT conducted a peer review workshop with national transit experts to review the Study’s history and provide recommendations. They suggested the Study team move forward with multiple alternatives in the Draft EIS.

Exhibit 1: Central Broward East-West Transit Study Area



**Exhibit 2: 2006 Adopted Locally Preferred Alternative**

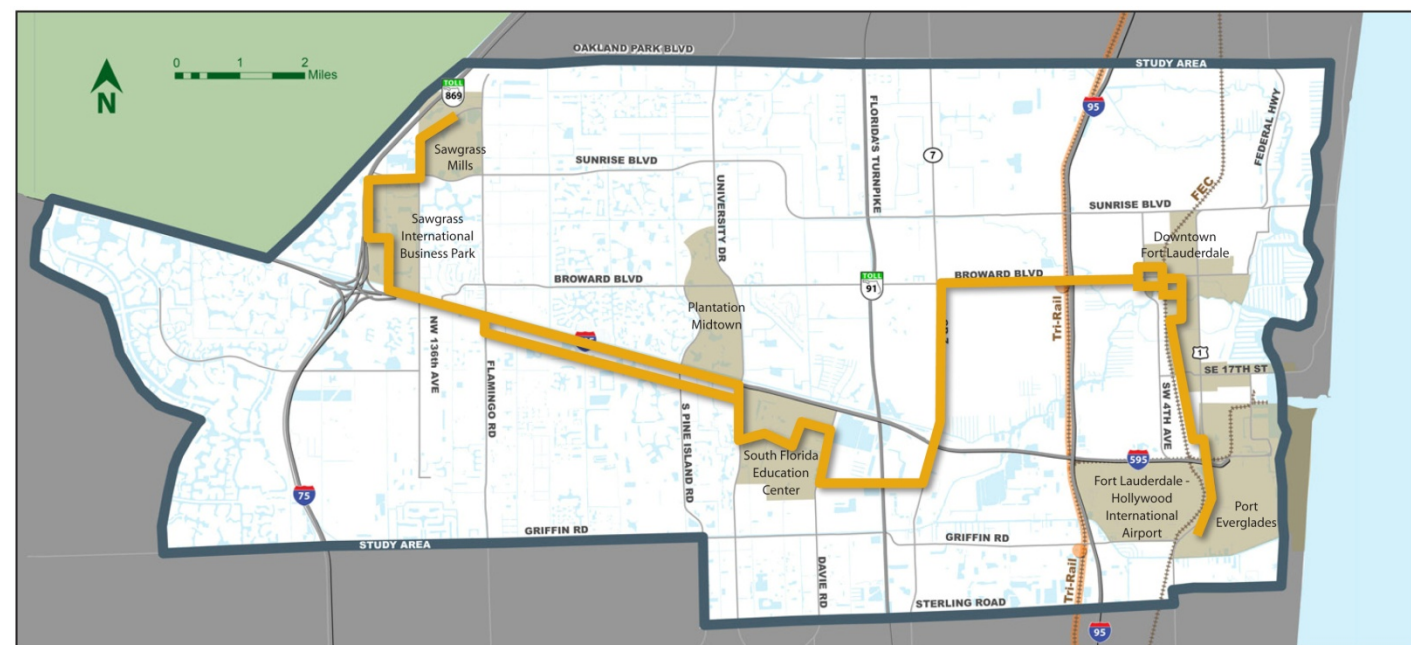


Since that time, FDOT convened partner transportation agencies (BCT, SFRTA, and the Broward MPO) to reintroduce alignments previously reviewed with the TAG and the public since the Scoping meetings. This reconsideration by leadership from the transportation agencies led to new alternatives, using various modes and alignments, which were presented to the Broward MPO on October 14, 2010. This new commitment to agency partnership coordination was memorialized in a Memorandum of Understanding (MOU) (see Appendix A) agreed to by all four agencies concerning their respective roles during the Study. Refinements to the new alternatives were made through collaboration among these agencies, and again presented to the Broward MPO on February 10, 2011. Given the cooperation among the agencies in developing consensus for these new alternatives, the Broward MPO confirmed their desire to move forward with the Study of these new alternatives and to make available further opportunities for sufficient public and stakeholder input prior to a decision. Following consultation with the FTA on the new alternatives, the completion of the environmental phase was deferred, pending the outcome of the additional technical study and selection of a revised LPA.

### 1.3 Regional Partnership in Decision Making

The partnership between the four transportation agencies in Broward County (BCT, SFRTA, the Broward MPO, and FDOT) has been integral in ensuring a focused approach. An Executive Committee convened in October 2010, consisting of leadership from each of the four agencies. An MOU defines the participation of each agency in the public outreach efforts related to the Study. This serves as a clear indicator of each agency’s support for the Study.

**Exhibit 3: 2010 Build Alternative**





## 2.0 Purpose and Need

### 2.1 Purpose of the Study

The purpose of the Central Broward East-West Transit Study is to identify premium transit services that will provide mobility options, improving east-west travel in Central Broward County.

### 2.2 Need for the Study

The Broward County east-west travel market faces roadway congestion, increased growth with limited capacity, and limited transit service options.

#### 2.2.1 Limited Capacity on East-West Roadways

The Central Broward East-West Transit Study considers east-west travel alternatives to alleviate the currently congested and constrained I-595. I-595 is the only east-west limited access freeway serving the majority of travel demand in the corridor, with more than 185,000 vehicle trips a day. I-595 opened to traffic in 1989, connecting the rapidly developing residential suburbs in the western portion of the county with the downtown/port/airport area and I-95, the north-south transportation spine for southeast Florida. The facility experienced capacity constraints within five years due to rapid local and regional growth. Development has progressed over the past 13 years in the western portion as a desirable location for families looking for larger homes and well-performing schools, and redevelopment substantially increased densities in the older coastal communities to the east in the employment heart of the county. Southwest Florida's vast growth has contributed to travel demand in the corridor which feeds directly to I-75. The result is a heavily congested corridor suffering from deteriorating reliability and safety.

Travel demand on I-595 is expected to exceed 300,000 vehicles per day by 2030. The Master Plan for the corridor includes the addition of tolled reversible express lanes which will consume the remaining right-of-way, yet will not meet the anticipated traffic demand. Additionally, the local roads in the Fort Lauderdale area cannot be expanded to accommodate projected growth without extensive property acquisitions and community impacts.

Prior to the construction of Express Lanes on I-595, there were three lanes in each direction on I-595. The Express Lanes, currently under construction (or already build) are expected to be completed by the summer of 2014 and will provide three additional lanes in the median of the corridor. These new lanes will reverse direction in peak travel times (eastbound in the morning and westbound in the evening). The 2009 and 2035 V/C and level of service (LOS) for segments along I-595 are shown in Exhibit 4.

Exhibit 4: 2009 and 2035 I-595 V/C and LOS

Segment	2009		2035	
	V/C	LOS	V/C	LOS
E of SW 136 Ave	1.45	F	0.69	C
E of Flamingo Rd	1.50	F	0.60	B
E of Hiatus Rd	1.52	F	0.71	C
E of SW 100 Ave	1.48	F	0.79	C
E of Pine Island Rd	1.68	F	0.78	C
E of University Dr	1.23	F	1.00	D
E of Davie Rd	1.44	F	0.65	C
E of Florida's Turnpike	1.77	F	0.71	C
E of SR 7	1.22	F	1.20	F
E of I-95	0.74	C	0.97	D
E of US 1	0.21	B	0.66	C

#### 2.2.2 Rapid Population and Employment Growth

Broward County's population is expected to grow from 1.7 million to 2.3 million, adding 29 percent more residents, and 37 percent more jobs from 0.7 to 1.0 million by 2035. In 2010, Broward County was the 18<sup>th</sup> most populous county in the country. Population density in central Broward County is also projected to grow by 25 percent more than the countywide average by 2035. While growth is anticipated throughout the study area, it is projected to concentrate in the activity centers, the largest trip generators in Broward County, furthering the need to accommodate east-west travel.

### 2.2.3 Limited Connections to Activity Centers in the County

- Broward County’s largest trip generators are located in the study area. Many of these activity centers rely on future premium transit improvements, the Central Broward East-West Transit Study alternatives specifically, to provide access to jobs, entertainment, and residences proposed in long-range plans. Premium transit improvements are expected to help provide the economic vitality and sustainability that are part of Broward County’s vision. The six activity centers listed below are depicted in Exhibit 5. Basic statistics for each activity center are shown in Exhibit 6:
- Sawgrass Mills Mall/BB&T Center/Sawgrass International Corporate Park
- Plantation Midtown
- South Florida Education Center (SFEC)
- Downtown Fort Lauderdale
- Port Everglades
- Fort Lauderdale-Hollywood International Airport (FLL)

Exhibit 5: Study Area Activity Centers

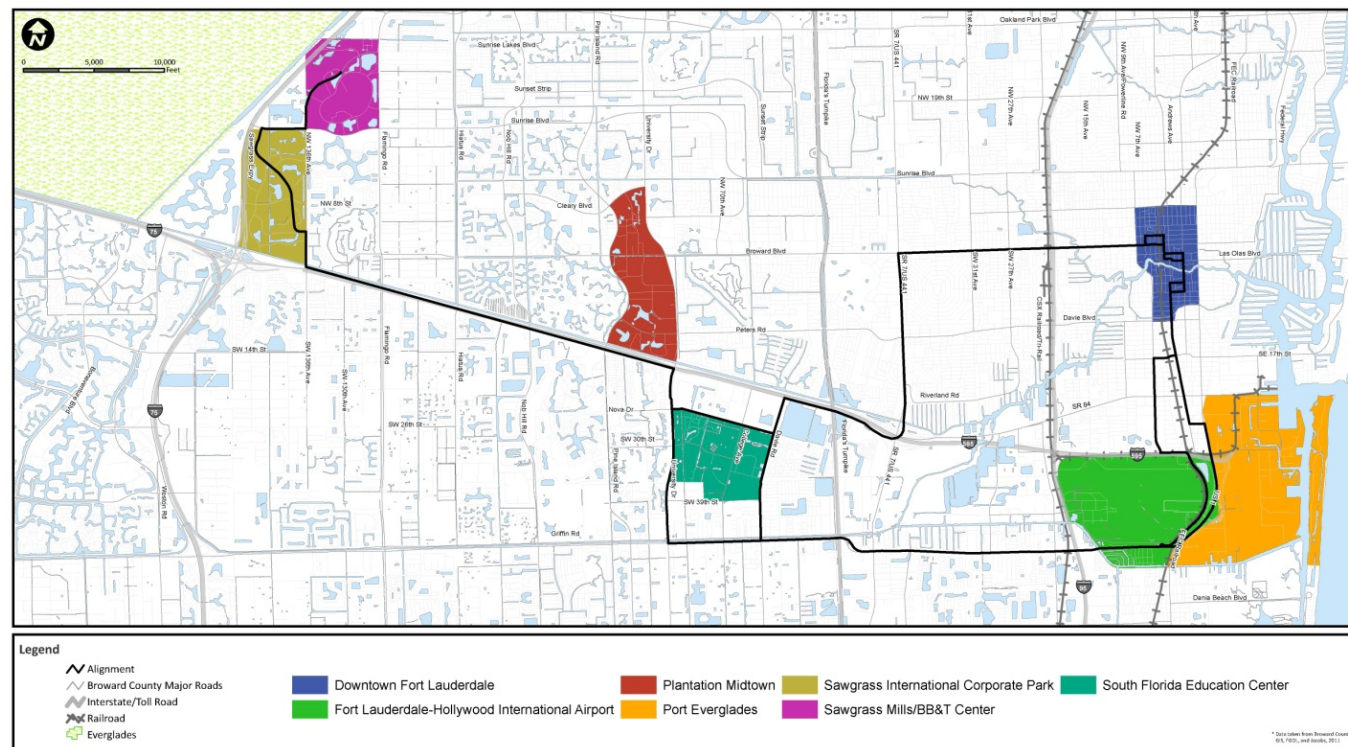


Exhibit 6: 2010 Statistics for Activity Centers

Activity Center	Acreage	Population	Employment	Student Enrollment	Commercial Space (sq ft)
Sawgrass	1787.4	0	15,334	0	2.4 million*
Plantation Midtown	904.8	2,482	18,560	0	5.5 million
SFEC	876.8	2,777	7,627	42,458	Not Available
Downtown	986.9	6,862	22,206	2,476	Not Available
Port Everglades	2312.9	0	3,940	0	Not Available
Airport	1655.4	0	5,894	0	Not Available

\*not including 600 acres of office space and the BB&T Center

#### Sawgrass Mills Mall/BB&T Center/Sawgrass International Corporate Park



These are located at the northeast and southwest corners of the intersection of Sunrise Boulevard and NW 136th Avenue. The Sawgrass Mills Mall is a major retail center and one of the largest malls in the world with 2.4 million square feet and over 350 name-brand stores and entertainment venues. It is adjacent to a high concentration of employment centers and medium to high density residential developments. Adjacent to the

Sawgrass Mills Mall is the BB&T Center (formerly the Bank Atlantic Center), an entertainment venue, which offers over 20,000 seats and over 7,000 parking spaces. Located to the south, the adjacent Sawgrass International Corporate Park is one of South Florida’s largest office parks with over 600 acres of business and office sites available. Roads feeding this activity center are Sunrise Boulevard, Flamingo Road, I-95, and Sawgrass Expressway. The 2010 population total for this western activity center was 2,763. This number is projected to drastically increase to 12,709 by the year 2035. Likewise, its number of employees in 2010 was 15,334, which is expected to grow to 31,395 by 2035.

#### Plantation Midtown

This is the largest commercial district in the City of Plantation both in size and concentration of office and retail uses. It is located immediately north of I-95 bound by Cleary Boulevard, Pine Island Road and University Drive, and is spread over 860 acres. The area contains approximately 2.5 million square feet of retail and three million square feet of office space. Roads feeding this activity center include Broward Boulevard, University Drive, Pine Island Road, Cleary Boulevard, and I-95. The businesses employ approximately 18,560 people, and about 1,015 households are found within Plantation Midtown. The number of employees with this district is expected to grow to 21,125 by 2035.

In 2002, the City adopted the Central Plantation Conceptual Plan, and projects are in the works to change this predominantly commercial district into a live, work, and play Town Center for the City of Plantation and Central Broward County. Its population is projected to increase from 2,482 to 7,650 between 2010 and 2035.





### *South Florida Education Center (SFEC)*

This is a consortium of educational institutions that includes Broward College, Broward Virtual Education, College Academy at Broward College, Florida Atlantic University Davie Campus, Florida International University, McFatter Technical Institute, Nova Eisenhower Elementary School, Nova Southeastern University, and the University of Florida Fort Lauderdale Research and Education Center. In 2010, the number of students in all SFEC institutions was approximately 42,458 with growth

expectations to about 54,072 by 2035, an increase of almost 30 percent. In addition, jobs in the SFEC are expected to grow from about 7,627 in 2010 to about 8,245 in 2035. Population growth is also expected to rise from 2,777 to 3,379 between 2010 and 2035. The SFEC is located between University Drive and Davie Road, south of I-595, and north of Griffin Road. Feeder roads are I-595, University Drive, Griffin Road, and Davie Road. The SFEC campus is one of the biggest generators of traffic in Broward County, resulting in the formation of the SFEC Transportation Management Area to help with mobility and parking issues.



### *Downtown Fort Lauderdale*

This is the main Central Business District (CBD) for Broward County, and includes government buildings (the County Government Center, City Hall, and the State and Federal Courthouses), educational centers, high-density employment, and residential buildings. Major roads that lead to the downtown area include Broward Boulevard, Andrews Avenue, US 1, and Davie Boulevard. The downtown area had about 22,206 jobs in 2010 and is expected to have about 24,522 in 2035. Downtown Fort

Lauderdale has changed dramatically in the last seven years in both appearance and substance. Since 2000, more than a dozen residential high rises have been built. Households in the downtown area are expected to grow from 2,923 in 2010 to 5,123 in 2035, reflecting an expected population growth within the CBD from 7,065 in 2010 to 12,003 in 2035. Downtown Fort Lauderdale was previously primarily a center for work and entertainment, but has transformed into a vibrant, multi-use activity center.



### *Port Everglades*

This seaport's jurisdiction encompasses a total of 2,190 acres, about 1,742 acres of which are upland and 448 acres are submerged land. It is a major employment center in Broward County and the South Florida region as a whole, with employment projected to grow from 3,940 jobs to 5,519 jobs from 2010 to 2035. This employment number also greatly underestimates the importance of the Port in term of generating jobs.

There are many people employees based in the regional operations of Port Everglades that do not work specifically at the Port. It supports workers who are employed off-site, but whose jobs are dependent on the Port. It also supports a thriving cruise industry. The roads serving this port include US 1, I-595, 17th Street Causeway, and SR 84.



### *Fort Lauderdale-Hollywood International Airport*

The airport is located in the southeast corner of the study area at the I-95 and I-595 interchange. Major roads that lead to the airport include I-95, I-595, SR 84, and US 1. This is a major employment generator that is anticipated to grow dramatically in the future. The airport employed 5,894 in 2010. This number is expected to grow to 6,359 by 2035, but similar to Port

Everglades, the airport creates many more off-site employment opportunities than these totals imply. The total passenger throughput at the airport was 21.37 million in 2006, and according the 2006 Fort Lauderdale-Hollywood International Airport Master Plan Update, is anticipated to grow by 3.2 percent annually to over 32 million in 2020.

## **2.2.4 Increased Travel Demand and Congestion**

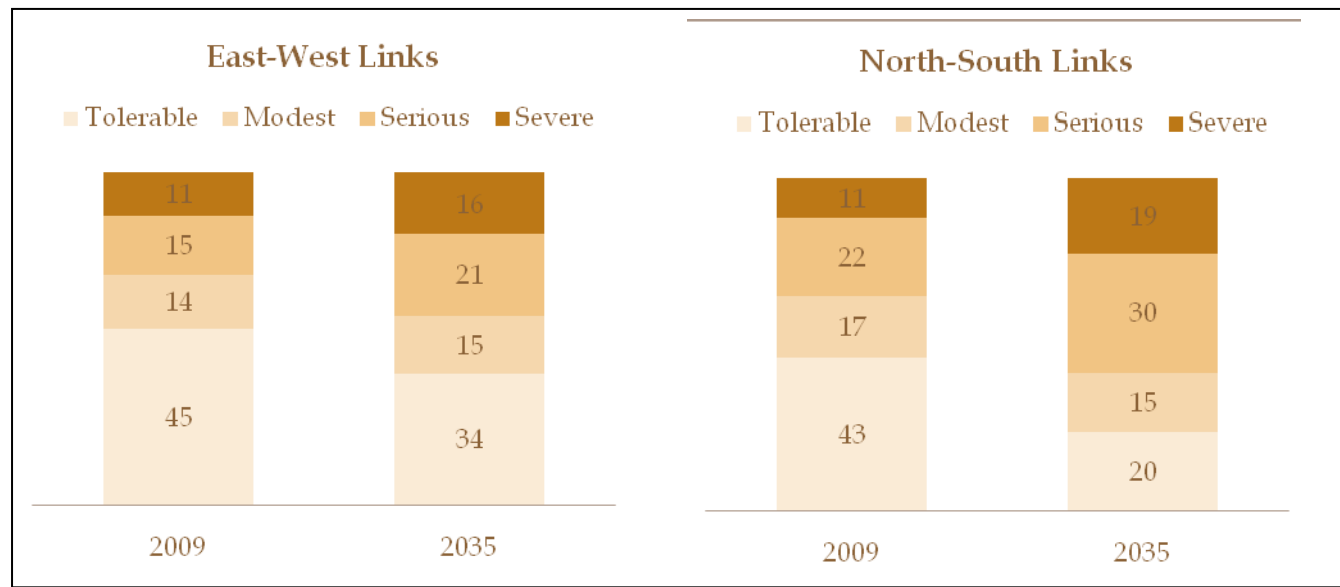
The capacity of transportation facilities and services throughout the central portion of Broward County is not adequate for the present movement of goods and people. Roadways in the study corridor are at capacity. Recent growth in the county has been at its western edge and has led to a growing need to accommodate east-west travel. High levels of travel and congestion on major east-west roadways characterize conditions of this area. Peak hour average travel speeds in the study area are anticipated to deteriorate by as much as 75 percent by 2030. Countywide, vehicle hours of delay are expected to increase by a factor of eight.

I-595, the only east-west limited access facility in Central Broward County was designed for a capacity of 105,800 to 144,300 vehicles per day. However, the high traffic volumes (ranging from 160,000 to 211,000 vehicles per day in 2009 and expected to increase to 238,000 by 2035) that are seen on I-595 indicate not only the obvious need to accommodate additional east-west travel demand, but also a need for alternatives to single-occupant vehicle travel. Heavily congested and slow-moving traffic is common in the eastbound direction in the a.m. peak period, often extending for several miles. The predominant peak period directions are eastbound in the morning and westbound in the evening, a function of the residential communities in the west and employment centers in the east. As travel demand continues to grow, the dominance of this travel pattern is diminishing as a result of growth in business, retail, and other commercial activity centers in the central and western parts of the study area.

In addition to I-595, the limited access highways located within the study area include I-75, Sawgrass Expressway (toll facility), Florida's Turnpike (toll facility), and I-95. There are nine east-west and seven north-south arterials providing connectivity between collector streets and highways in Central Broward County. The east-west facilities include Commercial Boulevard, Oakland Park Boulevard, Sunrise Boulevard, Broward Boulevard, Davie Boulevard, Griffin Road, and Stirling Road. The north-south facilities located within the study area of this Study include SW 136th Avenue, Flamingo Road, Nob Hill Road, Pine Island Road, University Drive, SR 7/US 441, and US 1.

Average annual daily traffic volumes, estimated volumes, roadway capacity, volume to capacity (V/C) ratios, and levels of service information for 2009 and 2035 for the major east-west and north-south roadway segments in the study area were examined to assess roadway congestion and travel demand. V/C ratios less than 0.85 are considered to represent tolerable traffic conditions and ratios between 0.85 and 1.00 indicate a modest level of traffic congestion. V/C ratios over 1.00 indicate serious traffic congestion and ratios over 1.25 indicate severe levels of congestion. A comparison of the linkage V/C ratios between 2009 and 2035 is illustrated in Exhibit 7.

**Exhibit 7: Redistribution of V/C among all links from 2009 to 2035**



Most segments of I-595 in the study area experienced serious or severe levels of congestion in 2009. Due to roadway improvements currently under construction, including ramp improvements and the addition of reversible managed lanes in the median, the conditions on I-595 are projected to improve by 2035. Only one segment of I-595, east of SR 7/US 441, is projected to operate at Level of Service (LOS) E, with all others having LOS D or better.

While conditions on I-595 may improve, the projected conditions on parallel arterials do not fare as well. Of the 74 east-west arterial roadway segments examined within the study area, 17 were at LOS E or F in 2009, with 5 segments with a V/C ratio of 1.25 or greater. Conditions are projected to worsen in 2035, when an additional 16 segments (33 in total) will have LOS E or F, and an additional 12 (17 total) segments with V/C ratios in excess of 1.25. The majority of the east-west arterial roadway segments that will operate at LOS E or F are located east of University Drive, demonstrating a need for better travel options in the eastern portion of the study area. Additionally, 84 north-south roadway segments were examined within the study area. In 2009, 23 of these segments were at LOS E or F, with 11 segments with a V/C ratio of 1.25 or greater. Conditions are projected to worsen in 2035 when an additional 26 (49 total) segments will have LOS E or F, and a total of 19 segments (8 additional) will have V/C ratios in excess of 1.25. As with the east-west arterial roadways, a majority of the roadways that will operate at LOS E or F in the year 2035 are located east of, and include, University Drive, further demonstrating the need for better mobility in the eastern portion of the study area.

These projected LOS and V/C conditions are projected to occur despite programmed improvements included in the FDOT Adopted Work Program, the Broward MPO’s Transportation Improvement Program (TIP), and the 2035 LRTP.

### 2.2.5 Limited Transit Service

Transit services provided within the study area today include:

- 26 fixed bus routes operated by BCT;
- 95 Express Bus Service operated by Miami-Dade Transit from Fort Lauderdale to downtown Miami;
- Community buses operated by BCT in several cities including Dania Beach, Davie, Fort Lauderdale, Lauderdale Lakes, Lauderhill, and Plantation;

- Paratransit demand response services for the disabled community;
- Water Taxi service operated by a private company along the Intracoastal Waterway and the New River in downtown Fort Lauderdale; and
- Rail stations at Broward Boulevard and Griffin Road served by Tri-Rail commuter trains connecting to Miami-Dade and Palm Beach Counties, as well as two station area bus circulators.

East-west transit within the study area is currently served by BCT with local fixed service routes and community bus services. Right-of-way constraints in the corridor restrict current transit services to operate in mixed traffic, and therefore transit service is subject to the congestion delays experienced by automobile traffic. The local nature of the bus service also increases travel times due to frequent stops.

Implementation of an east-west premium transit enhancement would connect to five of the county’s largest activity centers – the Fort Lauderdale-Hollywood International Airport, downtown Fort Lauderdale, SFEC, Plantation Midtown, and the Sawgrass Mills Mall/BB&T Center/Sawgrass Corporate Business Park. Currently, these five activity centers are primarily dependent on automobiles for access.

## 2.3 Study Goals and Objectives

Specifically, the Study goals are:

- **Travel and Mobility Goal:** Provide a premium transit improvement that enhances east-west mobility in central Broward County.
- **Financial Goal:** Provide a premium transit improvement that most efficiently uses available financial resources.
- **Economic Goal:** Provide a premium transit improvement that supports economic growth and development.
- **Community Goal:** Provide a premium transit improvement that is consistent with the needs and desires of the residents of Broward County, in order to maximize community acceptance and support.
- **Land Use Goal:** Provide a premium transit improvement that ensures compatibility between land use policies and transit service so that the need for vehicular trip-making and the amount of vehicular travel is reduced and the opportunities for transit-oriented development are maximized.
- **Environmental Goal:** Provide a premium transit improvement that enhances and preserves the social and physical environment, and that keeps potential impacts to sensitive resources to a minimum.

Specific objectives for the Central Broward East-West Transit Analysis include the following:

- **Travel and Mobility Objectives:**
  - Select an alternative that maximizes “system user benefits” as defined by the FTA (essentially, an alternative that provides the greatest, overall travel time savings in the corridor).
  - Select an alternative that provides the highest level of accessibility (connects the greatest number of major destinations, e.g., employment nodes, activity centers, the airport, the port, etc.).
  - Select an alternative that has high ridership potential.
- **Financial Objectives:**
  - Select an alternative that is cost effective in terms of capital costs per new rider and operating cost per passenger mile.
  - Select an alternative that can be funded locally in terms of both capital cost and operating and maintenance costs.
  - Identify the appropriate local implementing agency.
- **Economic Objectives:**
  - Select an alternative that will provide cost-effective mobility.



- Select an alternative that will leverage sustained economic development in the corridor.
- **Community Objectives:**
  - Select an alternative that will be supported by the municipalities that it will serve.
  - Select an alternative that will be endorsed by community organizations.
  - Select an alternative that is compatible to the greatest degree possible with the Tri-Rail 2020 Long-Range Master Plan, the I-595/I-95 Master Plan, the 2020 Vision for the Fort Lauderdale-Hollywood International Airport, the Broward County Mega-Transport Zone Conceptual Framework, the Broward County Transit Master Plan, Broward County Transit “Bridge” Corridor Alternatives Analysis, South Florida Education Center Transit Access Study, Downtown Fort Lauderdale Circulation Study (RAC/SAC Study), Plantation Central Development District Study, Downtown Fort Lauderdale Connection Study, the South Florida East Coast Corridor Transit Analysis, and the Fort Lauderdale Downtown Development Authority.
- **Land Use Objectives:**
  - Coordinate the premium transit improvement with existing and planned development and the growth of Broward County in an efficient and sustainable way.
  - Identify transit-supportive land use policies that are in place in the corridor and affected municipalities.
  - Identify transit-supportive land use policies that need to be implemented in the corridor and affected municipalities.
- **Environmental Objectives:**
  - Select an alternative that has minimal negative impact on sensitive resources (noise receptors, wetlands, historic resources, etc.)
  - Select an alternative that has maximum environmental benefit (e.g., greatest reduction in greenhouse gas and ozone precursor emissions, etc.).

## 2.4 Regional Context

Current regional plans were reviewed and considered during the Evaluation of Scoping Options process to ensure they are consistent and supportive of the Central Broward East-West Transit Study. The following transportation plans and studies were considered during the evaluation of alternatives.

### 2.4.1 South Florida Regional Transportation Authority Strategic Regional Transit Plan

The Strategic Regional Transit Plan identifies three alternative networks of future transit improvements to respond to specific desires of the community: Connective, Productive, and Value. A Connective Network would link areas of the region that currently, or expect to, produce a large number of trips and make the most of the region’s existing community investments and infrastructure land use vision. A Productive Network would produce the most riders for the system overall. A Value Network would balance the cost of the system with the benefits of the system, evidenced in the estimated number of transit riders. The Strategic Regional Transit Plan specifically refers to the Central Broward East-West Transit Study (with various alignments) in all network scenarios.

### 2.4.2 All Aboard Florida

In March 2012, Florida East Coast Industries, Inc. (FECI), the owner of the FEC rail corridor, announced that it was developing privately owned and operated intercity passenger rail service from Orlando to Miami. Their plan is to begin operations in 2014. FECI has stated that stations will be located in Miami, Fort Lauderdale, West Palm Beach, and Orlando, and is currently working with these communities to identify specific locations. Discussions regarding All Aboard Florida’s station location in Fort Lauderdale have focused on downtown Fort Lauderdale and the Fort Lauderdale-Hollywood International Airport. The Central Broward East-West Transit Study will continue to coordinate its station locations with All Aboard Florida’s efforts to optimize connections between these transit services.

### 2.4.3 South Florida East Coast Corridor Study

The South Florida East Coast Corridor Study (SFEC) is currently in Phase III, project definition and phased implementation. This phase includes updating travel demand forecasts with FTA, continuing public outreach, developing a Draft EIS, defining Study phases and implementation, and securing entry into Preliminary Engineering. Station areas for the South Florida East Coast Corridor Study include the Fort Lauderdale-Hollywood International Airport and the Fort Lauderdale Government Center, both of which would connect with the Central Broward East-West Transit Study. The next steps for the (SFEC) Study include refining the regional master plan/LPA, coordinating and negotiating with FEC and finalizing the FTA AA.

### 2.4.4 Broward MPO 2035 Long Range Transportation Plan

Broward County recently completed the 2035 update to the LRTP. This plan represents a paradigm shift compared to previous plans by setting the framework for a more balanced and forward-thinking system of many transportation modes and balancing levels of investment among modes. This approach provides more investment for transit and alternative opportunities to the personal automobile to travel around Broward County. Priority spending for transit, bicycle, pedestrian, and smart-growth policies, which integrate transportation with land use, is the hallmark of the current plan.

The Central Broward East-West Transit Study is included as an Illustrative Project in the Cost Feasible Plan pending the outcome of this study. Inclusion in an adopted cost affordable plan will be a prerequisite for the Study to be eligible for federal funding and to advance into preliminary engineering. Illustrative Projects will be added to the Cost Feasible LRTP as funds are secured.

### 2.4.5 Broward County Comprehensive Plan Transportation Element

One key factor brought to light in the Transportation Element of the Broward County Comprehensive Plan is the need for high capacity transit corridors, to ensure economic vitality, as well as minimize the impact on the environment. In particular, one of the premium transit enhancements included in the plan element is Light Rail on the Central Broward East-West Transit Corridor, spanning from Sawgrass Mills to the Fort Lauderdale-Hollywood International Airport.

### 2.4.6 Broward County Transit Development Plan

The Broward County FY 2009-18 Transit Development Plan (TDP) offers a comprehensive look at the operating and capital needs of BCT through the development of a detailed ten-year service plan for the fixed-route system and the identification of strategic transit needs, including higher capacity and faster traveling BRT on six corridors. Of the corridors specifically cited in the TDP (Oakland Park Boulevard, Broward Boulevard, Hollywood Boulevard, US 1, SR 7/US 441, and Sunrise Boulevard), portions of Broward Boulevard, US 1, and SR 7/US 441 are included in the Study alternatives.

### 2.4.7 I-595 Express Corridor Improvements Project

The I-595 project consists of the reconstruction of the roadway with reversible express toll lanes. Other associated improvements include adjacent crossroads, frontage roads and ramps from the I-75/Sawgrass Expressway interchange to the I-595/I-95 interchange and from Peters Road to Griffin Road on Florida’s Turnpike, construction of the New River Greenway and 13 sound barriers to impede noise across 20 communities. The corridor improvements project involves an area of 13 miles. The Central Broward East-West Transit Study is coordinating with the design team of the I-595 highway improvements.

#### 2.4.8 I-595 Express Bus

The I-595 Express Bus Service offers three services, one connecting Sunrise to Fort Lauderdale, a second connecting Sunrise to Miami, and a third connecting Weston to Miami. Pertaining to the Central Broward East-West Transit Study, there is an opportunity for two routes to share parking facilities at the BB&T Center in Sunrise, designated as the western terminus for the Study. While the I-595 Express service to Fort Lauderdale provides a one-seat ride from Sunrise to downtown with limited stops, the Central Broward Transit system intends to offer off-peak service to intermittent destinations such as Tri-Rail, the Fort Lauderdale-Hollywood International Airport, and the SFEC.

#### 2.4.9 South Florida Regional Planning Council SR 7 Collaborative

In October 2003, the SR 7 Collaborative began work on the development of a Strategic Master Plan for the entire 25.6-mile corridor. Over the past few years there have been a number of land use changes (both through local government reform and natural progression) and development transforming SR 7/US 441 into a transit-supportive corridor. The SR 7 Collaborative encourages a mix of land uses that foster a transit-supportive environment and cites multiple intersections for potential connectivity along Oakland Park Boulevard, Sunrise Boulevard, Broward Boulevard, and I-595, all of which have been studied as potential alignments for the Central Broward East-West Corridor.

#### 2.4.10 The Downtown Development Authority's Streetcar - The Wave

The Wave is a 2.7-mile (5.4 miles double tracked) streetcar planned for downtown Fort Lauderdale. The system will serve as the local circulator/distributor connecting major employment centers and regional activity generators. The current project schedule anticipates the system to be operational by late 2016. The Central Broward Transit Study connects with the Wave at 17<sup>th</sup> Street by Broward Medical Center and near the BCT Central Terminal. The Central Broward East-West Transit Study is considered an extension of the Wave, for east to west mobility.

#### 2.4.11 Broward County Sunport Project Development and Engineering (PD&E) Study

The Sunport Airport/Seaport People Mover was identified in the Broward County 2020 Vision Plan, outlining a framework for future development at the Fort Lauderdale-Hollywood International Airport and elements to promote regional transportation and transit improvements. The People Mover was further examined in a feasibility report in 2004, which identified operational issues and financial feasibility for the proposed system (and corridors). The Sunport study area is bounded by Southeast 17<sup>th</sup> Street to the north, airport access roads (north of Griffin Road) to the south, the SFRC corridor to the west, and Port Everglades to the east. It is envisioned that the People Mover will provide additional and effective transportation capacity between the regional transportation network, the airport and the seaport. A possible future Broward Intermodal Center could also serve as a transfer point between the People Mover and the various elements of the regional transportation network, including integration with the Central Broward East-West Transit Study.

#### 2.4.12 I-95 Express Bus

There are currently four I-95 Express Bus routes in operation: Broward Boulevard, Sheridan Street, Pines/Hollywood Boulevard, and Miramar Town Center. All of these routes provide service to downtown Miami. The Central Broward East-West Transit Study will provide a connection to the I-95 Express Bus route from the Broward Boulevard Park-n-Ride station adjacent to the Tri-Rail station. This bus service operates every 15 minutes on weekdays during morning and afternoon peak travel periods, starting at 5:45 a.m. until 8:45 a.m. and at 4:00 p.m. until 7:00 p.m. The Express Bus is a hybrid articulated vehicle with Wi-Fi accessibility and convenient service. There are also potential plans to expand the service once construction is completed that will extend I-95's managed lanes north into Central Broward County.

#### 2.4.13 University Drive Alternatives Analysis

The University Drive AA is exploring transit alternatives on University Drive. The study focuses on a 27-mile stretch of University Drive, between Sample Road and Hallandale Beach Boulevard. Though primarily commercial, this section of road has a mix of land uses and includes a number of employment centers. With this added transportation option, access to employment centers would be improved, as well as the general economic development of the cities that border this segment of University Drive. The University Drive AA overlaps with the Central Broward East-West Transit Study area for the portion of University Drive between I-595 and Griffin Road.

#### 2.4.14 Oakland Park Boulevard Alternatives Analysis

The Oakland Park Boulevard AA is evaluating options for transit improvements in the Oakland Park Boulevard corridor. A goal of the study is to improve service and reliability of BCT Route 72, which faces extreme traffic congestion resulting in unreliable travel times. The focus of this study is to improve mobility on the corridor and in the area. Oakland Park Boulevard is located in the northern portion of the Central Broward East-West Transit Study area, and could connect to it at the BB&T Center and Sawgrass Mills area.

#### 2.4.15 Plantation/Sunrise Livability Study

This Plantation/Sunrise Livability Study pertains to the elements of the Mobility Hubs, including the location of facilities such as stations and transit stops, needed bike and pedestrian infrastructure opportunities for connections to local streets, designation of appropriate land uses, and guidelines for appropriate redevelopment and retrofitting. The study overlaps with the Central Broward East-West Transit Study area, and specifically with the alignment in the City of Sunrise on Northwest 136<sup>th</sup> Avenue near the BB&T Center and Sawgrass Mills Mall. The Broward MPO is working with the City of Sunrise to identify a Mobility Hub location that would serve the needs of both existing and planned transit in this area. In Plantation, the study is focusing on Broward Boulevard between University Drive and Pine Island Road, and is not included in the alternatives for Central Broward East-West Transit Study.

#### 2.4.16 Broward Boulevard Transit Corridor Study

The Broward Boulevard Transit Corridor Study aims to increase transit ridership, while decreasing travel times for both transit and traffic, and improve access to transit along the corridor between BCT's West Regional Terminal in the City of Plantation and US 1 in Fort Lauderdale. This area overlaps with the SR 7/Broward Boulevard Alternative of the Central Broward East-West Transit Study. Premium bus service would be offered along Broward Boulevard and then connect with a modern streetcar at the Broward Boulevard Tri-Rail Station, before continuing to downtown Fort Lauderdale.



### 3.0 Alternatives Considered

#### 3.1 No Build Alternative

The No Build Alternative is a representation of the transportation conditions in the forecasted year if none of the proposed improvements are built. It provides the basis for comparison of the TSM Alternative and the Build Alternatives. The Broward MPO’s 2035 Cost Feasible LRTP was used to define the No Build Alternative, consisting of the existing and committed projects, plus the transit elements identified in the 2035 Cost Feasible LRTP. The 2035 Cost Feasible Plan also includes four Illustrative Projects; one is an alignment for the Central Broward East-West Transit Study. For purposes of this Study, the No Build does not include the Illustrative Projects.

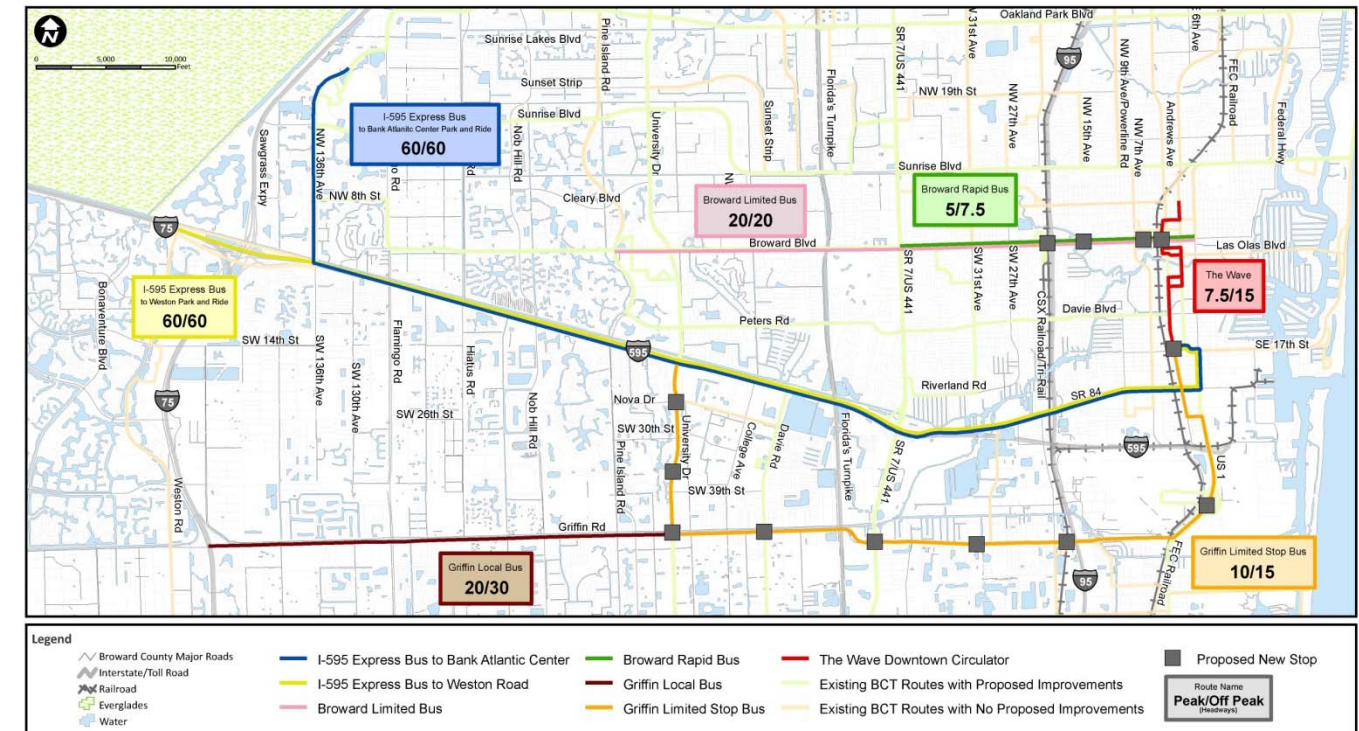
#### 3.2 Transportation Systems Management (TSM) Alternative

The TSM Alternative is a relatively lower cost alternative used to compare the Build Alternatives before selecting the LPA. Emphasis is customarily given to upgrading existing transit service through operational and small physical improvements, without a major capital investment. The proposed TSM Alternative for this Study was developed in consultation with staff members from BCT, the Broward MPO, and FDOT District Four, and includes the No Build Alternative; the Wave streetcar, identified as an Illustrative Project in the 2035 LRTP; modifications to several planned route headways; and additional limited stop bus service.

Exhibit 8 illustrates the planned transit improvements<sup>1</sup> included in the TSM Alternative. Exhibit 9 lists those improvements.

1. The planned local bus service on Griffin Road from University Drive east was replaced with limited stop bus service from University Drive at Nova Drive to the Wave station at 17<sup>th</sup> Street with headways of 10 minutes during the peak period and 15 minutes during the off-peak period.
2. A new limited stop bus service on Broward Boulevard between the Broward Central Terminal and the Western Terminal was included with headways of 20 minutes in the peak and off-peak periods.
3. The peak period frequency of the local bus on Broward Boulevard (Route 22) was reduced from 10 to 20 minutes based on the Broward Boulevard Corridor Transit Study.
4. Off-peak service with 60 minute headways was added for the I-595 Express Bus routes.
5. The proposed Wave streetcar circulator in downtown Fort Lauderdale with peak period headways of 7.5 minutes and off-peak headways of 15 minutes. This Illustrative Project was included in the TSM based on the submittal of its environmental document to the FTA, the local commitment to operation and maintenance funding, and the project sponsor’s pursuit of capital funding.

Exhibit 8: Existing and Planned Transit Service Improvements



<sup>1</sup> From the Broward MPO 2035 LRTP and the Transit Development Plan.



**Exhibit 9: Existing (2010) and Planned Transit Service Improvements Included in the TSM Alternative**

Route Number	Roadway Name	Alignment Orientation	Current Operations		Planned Improvements Contained in the TSM <sup>1</sup>		Other TSM Improvements	
			Peak Hour Headway <sup>2</sup>	Off-Peak Hour Headway <sup>2</sup>	Peak Hour Headway <sup>2</sup>	Off-Peak Hour Headway <sup>2</sup>	Peak Hour Headway <sup>2</sup>	Off-Peak Hour Headway <sup>2</sup>
1	US 1	North-South	15	20	10	15	--	--
US 1 Breeze	US 1	North-South	30	--	10	--	--	--
2	University Drive	North-South	20	30	10	15	--	--
University Breeze	University Drive	North-South	30	--	5	7.5	--	--
9	Johnson Street-Davie Road-Broward Boulevard	North-South	45	60	15	20	--	--
18	SR 7/US 441	North-South	15	20	10	15	--	--
441 Breeze	SR 7/US 441	North-South	30	--	5	7.5	--	--
New	Flamingo Road	North-South	--	--	20	30	--	--
New	Nob Hill Road	North-South	--	--	15	20	--	--
New	Pine Island Road	North-South	--	--	15	20	--	--
22	Broward Boulevard	East-West	15	30	15*	20*	20	--
					10	20	--	--
New	Broward Boulevard BRT (SR 7/US 441 to downtown)	East-West	--	--	5	7.5	--	--
	Broward Boulevard from Central Terminal to Western Terminal		--	--	--	--	20	20
30	Peters Road and Davie Boulevard	East-West	20	30	10	15	--	--
36	Sunrise Boulevard	East-West	20	30	15*	20*	--	--
					10	15	--	--
New	Sunrise Rapid Bus	East-West			7.5	15	--	--
72	Oakland Park Boulevard	East-West	15	20	10	15	--	--
New	Oakland Park Boulevard/Andrews Avenue Rapid Bus	East-West/North-South	--	--	10	15	--	--
New	Oakland Park Breeze	East-West	--	--	10	--		--
New	I-595 Express Bus Weston to Fort Lauderdale	East-West	--	--	60*	--	--	60
New	I-595 Express Bus Sunrise to Fort Lauderdale	East-West	--	--	60*	--	--	60
New	Griffin Road Local Bus	East-West	--	--	20	30	--	--
New	Griffin Road west of University Drive Local Bus	East-West	--	--	--	--	20	30
New	Griffin Road East of University Drive Limited Stop Bus		--	--	--	--	10	15
Tri-Rail	South Florida Rail Corridor/CSX	North-South	20	60 (weekday) 120 (weekend)	--	--	--	--
Wave	Downtown Fort Lauderdale Circulator		--	--	--	--	7.5	15

Notes: <sup>1</sup>Implementation year is 2035 unless noted with (\*) which indicates 2016.

<sup>2</sup> In Minutes.

### 3.3 Build Alternatives

Two alignments were considered for the Study, and from those two alignments, three Build Alternatives were considered. The alignments extend from Sawgrass Mills in Sunrise in the west, through the Sawgrass Corporate Park and SFEC, to the Fort Lauderdale-Hollywood International Airport and downtown Fort Lauderdale in the east. All alternatives consist of a mix of premium bus and modern streetcar. All alternatives also propose premium bus-only in the west (from Sawgrass Mills to I-595 and University Drive) and modern streetcar-only in the east (from the Broward Tri-Rail Station to the Griffin Road Station). The modern streetcar in the eastern portion represents an extension of the Wave streetcar to the Broward Boulevard Tri-Rail Station to the west and to the airport and Griffin Road Tri-Rail station to the south. The central portions of the alignments are where the alignments differ. For the SR 7/Broward Boulevard Alternative, only premium bus was considered; both premium bus and modern streetcar were considered along the same Griffin Road alignment, making a total of three Build Alternatives (Exhibit 10 and Exhibit 11).

**Premium Bus** as defined for the study operates in mixed traffic with minimum peak frequencies of 10/15 minutes, including transit signal priority, off-board fare collection system, articulated low-floor transit vehicles, and real-time passenger information.

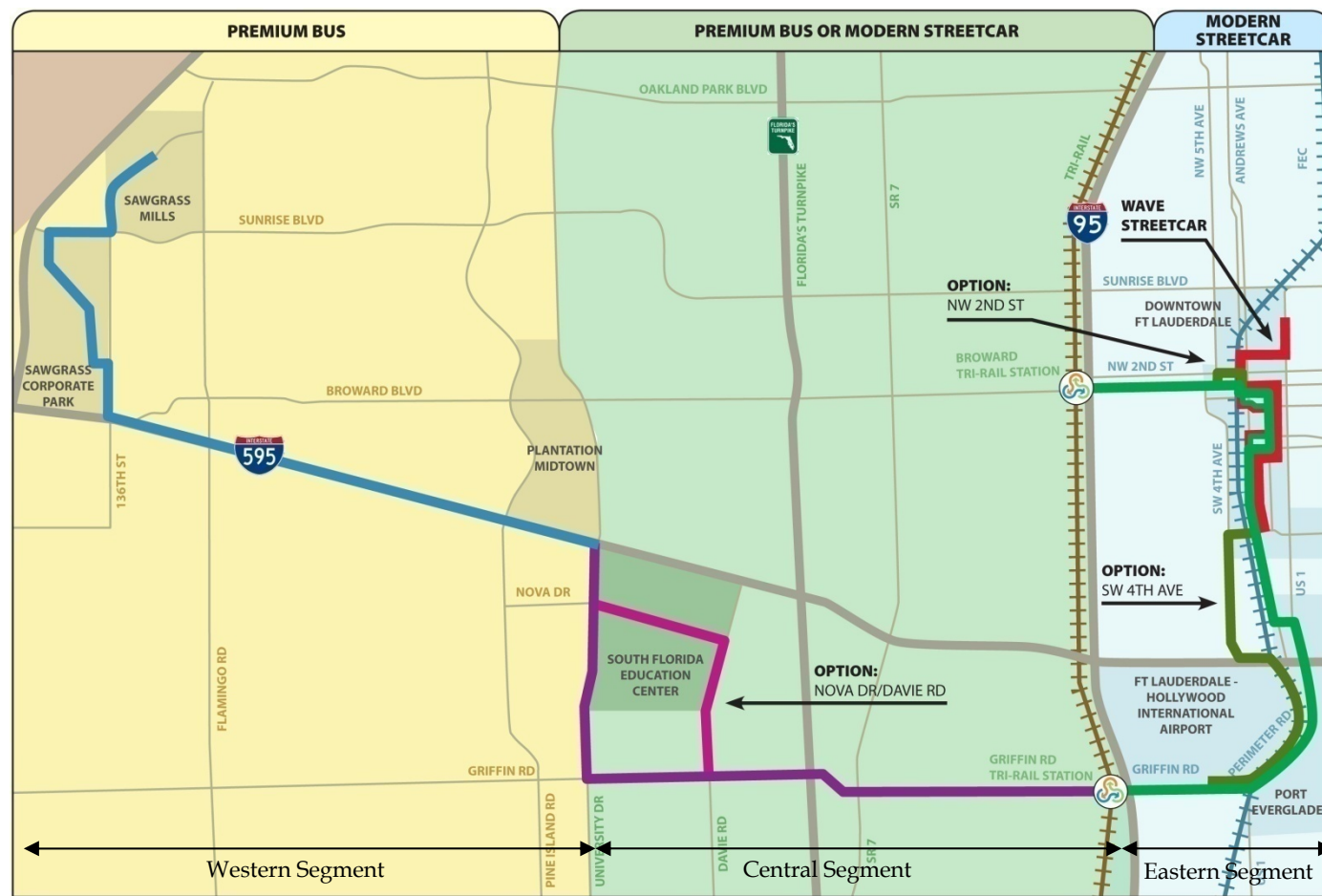
**Modern Streetcar** as defined for the study would be consistent with the vehicle selected for the Wave project. Although a vehicle has not yet been selected, hybrids are being considered that would require overhead electric wires at station locations. The same operating conditions for Premium Bus apply to the Modern Streetcar.

- SR 7/Broward Boulevard Alternative
- Griffin Road Premium Bus Alternative
- Griffin Road Modern Streetcar Alternative

Exhibit 10: SR 7/Broward Boulevard Alternative



### Exhibit 11: Griffin Road Alternatives



Due to the similarity of western and eastern portions of the alignments, to determine the LPA, this document focuses its consideration on the central portions of the alignments only. For the sake of simplicity, different options associated with each of the Build Alternatives were not taken into account separately unless otherwise noted. For the purposes of this analysis, all possible options associated with each alignment were considered to be a part of that alignment. Once an LPA is selected, the options associated with that alternative will be further evaluated.

#### Western Segment Overview

West of University Drive, the mode is Premium Bus which consists of 40 foot articulated buses traveling in existing travel lanes with other vehicles. Improvements to bus stops may include shelters and bus bays. The Premium Bus route begins at a terminus at the BB&T Center in Sunrise, travels south along 136th Avenue to Sunrise Boulevard, and then continues south down Sawgrass Corporate Parkway. It returns to 136th Avenue traveling south to I-595, and then continues east on I-595 to the University Drive exit to Nova Drive. The bus will operate in mixed traffic with transit signal priority for this portion of the alignment. A multimodal transfer center with a park-and-ride would be provided at or near this station to provide connectivity between travel modes from across the region.

#### Central Segment: Griffin Road Alternatives

These Alternatives provide for consideration of two modes – Premium Bus or Modern Streetcar – between the University Drive/Nova Drive Station and the Griffin Tri-Rail Station. Both Modern Streetcar and Premium Bus

vehicles would operate on existing travel lanes in mixed traffic for the majority of the alignment. There is sufficient right-of-way for dedicated transit lanes on University Drive between Nova Drive and Griffin Road, so this was assumed for both Premium Bus and Modern Streetcar modes. For all mixed traffic segments, buses would likely operate in curb lanes to accommodate a variety of bus vehicles with doors on the right of the vehicle, whereas streetcar tracks would more typically be placed in the inside lanes with stations in the medians. The western terminus for both modes would be located near the intersection of University Drive and Nova Drive where a station would provide for transfers and a possible park-and-ride.

The western terminus station at University Drive and Nova Drive would provide for Premium Bus and Modern Streetcar vehicles to load and unload passengers from one mode to another from the same platform to facilitate timed transfers between transit buses to/from the west connecting with Modern Streetcar vehicles to/from the east. Three options are identified for the SFEC that examined various ways to provide service to different destinations within the area. None of the options would eliminate the need for internal circulator service currently provided by the SFEC Transportation Management Association. These alignment options would however replace shuttle service currently connecting SFEC to the Tri-Rail Station at Griffin Road and I-95.

#### Central Segment: SR 7/Broward Boulevard Alternative

This Alternative considers only Premium Bus extending from Sunrise to the Broward Tri-Rail Station traveling along the same bus route described in the previous section west of University Drive. At the University Drive/Nova Drive Station, the bus would continue its route serving the SFEC via Nova Drive, then turn north where the bus route returns to I-595 on Davie Road, then continues east to SR 7/US 441 where it turns north onto SR 7/US 441 to Broward Boulevard, then east to the Broward Tri-Rail Station. At this terminal, passengers could transfer onto either the Modern Streetcar or Tri-Rail service, transfer to another bus route, or continue on the bus to the BCT Terminal at Broward Boulevard and NW 1st/Brickell Avenue for more transfer options to either bus or streetcar. Improvements on the Premium Bus service east of the Broward Tri-Rail Station would consist of bus shelters and possibly bus bays, though no specific locations have been determined at this stage of development. This alternative operates in mixed traffic throughout the entire alignment as there is insufficient right-of-way to accommodate the addition of dedicated transit lanes and lack of community support for time-dedicated transit lanes.

#### Eastern Segment Overview

East of I-95, Modern Streetcar is proposed; consisting of mixed traffic extensions of the Wave to the Tri-Rail stations located at Broward Boulevard and Griffin Road. The extension of the Wave to the Broward Boulevard Tri-Rail station is accomplished by extending the streetcar west on Broward Boulevard from the BCT Central Terminal to the Broward Boulevard Tri-Rail Station. The Modern Streetcar would terminate at the Broward Tri-Rail Station in all alternatives where the alignment would stub-end alongside the existing station platform for the Tri-Rail service. The extension of the Wave to the airport and Griffin Road Tri-Rail station would be accomplished by extending the streetcar south (either on Andrews Avenue and US-1 or on SW 4th Avenue and Perimeter Road) to Griffin Road and then west to the Tri-Rail Station. There are no portions of the alignment east of I-95 that would be considered to be exclusive lanes.

All Build Alternatives include a proposed Modern Streetcar portion, and would effectively extend the 2.7-mile Wave Streetcar west to the Broward Boulevard Tri-Rail Station and south to the Griffin Road Tri-Rail Station.

More information about the alternatives, including operations, infrastructure, and conceptual design, can be found in the *Central Broward East-West Transit Study LPA Selection Report, Part II, Conceptual Design Report*.



## 4.0 Environmental Screening

An environmental screening was conducted for the Build Alternatives that used a two-step approach. For the first step, the Department conducted a planning-level screen through the Efficient Transportation Decision Making (ETDM) process. For the second step, the Study team conducted its own screening, including desktop analysis and field reviews, to assess general feasibility of the Build Alternatives. This section of the report provides an overview of the findings from this environmental screening process.

### 4.1 Efficient Transportation Decision Making

The review of alternatives using the ETDM process highlighted the similarity between the two alignments being considered. Overall, there was little difference between the rankings and review comments for the SR 7/Broward Boulevard Alternative and for the Griffin Road Alternatives. The Build Alternatives were assessed as likely to have minimal to no effects in all evaluation categories except for three: Infrastructure, Historic/Archaeological Sites, and Wetlands. The FHWA indicated that both alignments could have moderate effects to roadway infrastructure due to the use of major roadways, the U.S. Army Corps of Engineers indicated that both alignments could have moderate effects to area wetlands based solely on the presence of them in the area, and the Florida Department of State indicated that both alignments could have moderate effects to Historical or Archaeological Sites. The only agency that reported a potential for substantial effects was the Seminole Tribe of Florida, which indicated that both alignments could negatively affect Historical or Archaeological Sites. These agencies all recommend further analysis to avoid negative effects on neighboring resources once an LPA is selected.

### 4.2 Neighborhoods and Community Facilities and Services

A wide variety of community facilities and resources were identified within a quarter-mile of both alignment alternatives. The types of facilities identified include recreational and cultural facilities, places of worship, healthcare and medical facilities, municipal complexes, social clubs, and a variety of other amenities and services. Many of these facilities not only cater to the surrounding neighborhoods, but are meant to serve the entire community, and in some cases, the region.

The central segment unique to the SR 7/Broward Boulevard Alternative has slightly more community facilities than does the segment unique to the Griffin Road Alternatives. Because both alignments, regardless of mode, would use existing right-of-way to the greatest extent possible, the potential for positive effects would likely be much greater than the potential for negative effects in most cases. Increased transit accessibility would be a benefit to the majority of these facilities, especially those that cater to large numbers of adults such as higher education facilities, hospitals, or government and municipal buildings. It is important to note that community cohesion would not be limited as a result of any Build Alternative. It would, in fact, be strengthened as a result of using existing roadways to provide easier access to places of importance within the community. The Study would not create any additional barriers or boundaries between residential neighborhoods and community facilities and services.

When comparing the central, differing segments of both alignments, the SR 7/Broward Boulevard Alternative has more government and public services and facilities. More specifically, it has more government and municipal buildings and social service facilities, while the Griffin Road Alternatives have more libraries and childcare facilities. The two alignments have the same number of fire and rescue stations and cemeteries, and neither contains any public housing units. With respect to medical and healthcare facilities, the SR 7/Broward Boulevard Alignment contains more miscellaneous medical facilities and doctors' offices, while the two contain the same number of nursing homes and assisted living facilities, and no hospitals. The SR 7/Broward Boulevard Alternative

contains more places of worship, but the Griffin Road Alternatives contain more sports and recreational facilities, entertainment and cultural facilities, and social clubs. The Griffin Road Alternatives also contain more schools and higher education institutions because it is adjacent to a much larger portion of the SFEC.

Because land use patterns are different along both corridors, the number of neighborhoods or HOAs is significantly less along the central segment of the SR 7/Broward Boulevard Alignment. These neighborhoods mostly consist of single-family homes, and tend to be large in nature. On the other hand, the Griffin Road Alignment mostly consists of neighborhoods or HOAs that are more likely to be multi-family condominiums or townhomes that are smaller in nature. There are more than twice as many neighborhoods or HOAs along the Griffin Road Alignment, but as previously stated, the Study would not disrupt community cohesion or restrict access within these neighborhoods. For more detailed information on the specific numbers, names, and locations of neighborhoods and HOAs along both alignments, see the *Central Broward East-West Transit Study Community Facilities Technical Memorandum*.

### 4.3 Environmental Justice

Populations were analyzed within a quarter-mile of the proposed alignment alternatives, utilizing 2010 U.S. Census and America Community Survey data, and then compared to the total population numbers and representation in Broward County. In addition to identification of minority (Hispanic/Latino or non-White) and low-income (below the U.S. Department of Health and Human Services' poverty level) populations, transit-dependent (with no vehicle) and elderly (aged 65 or older) populations were also identified due to the potential benefits both group could gain from transit services. Additional information on the Environmental Justice (EJ) analysis for both alignments is available in the *Central Broward East-West Transit Study Environmental Justice Technical Memorandum*.

The socioeconomic differences between the two alignments are found mainly in minority populations. The unique segments for the two alignments are roughly the same in terms of low-income, elderly, and transit dependent populations. With respect to minority populations, however, the Griffin Road corridor segment has a minority population that makes up about forty-five percent of the total population, whereas the SR 7/Broward Boulevard corridor segment is about seventy percent minority.

There are EJ populations found throughout both alignments. EJ populations cover a larger portion of the populated residential areas within the SR 7/Broward Boulevard segment corridor when compared to the Griffin Road segment corridor. This is not to say that there are greater EJ population numbers for the SR 7/Broward Boulevard Alternative, only that there are more areas that contain the presence of EJ populations. Additionally, this does not mean that there would necessarily be greater effects to these populations when compared to the Griffin Road Alternatives. EJ analysis conducted thus far only shows the areas where EJ populations exist, and briefly overviews potential effect areas. Burdens and benefits to these populations, as well whether they are disproportionate in nature, will be explored further in the National Environmental Policy Act (NEPA) review process once an LPA is selected.

#### 4.4 Acquisitions, Displacements, and Relocation

Given the conceptual level of the design at this point, it is not possible to quantify the amount of right-of-way required for any of the proposed alternatives. The alternatives for the Central Broward East-West Transit Study have been designed on existing roadways to minimize effects to local communities. There are instances where narrow strips (between two and six feet) of additional right-of-way may be necessary for proposed median running alternatives (streetcar portions of all alternatives and the bus portion on University Drive). There are no anticipated residential or business displacements as a result of any of the alternatives.

#### 4.5 Land Use and Economic Activity

A review of land use and economic activity was conducted to identify comprehensive plans and policies related to land use and growth, major activity centers, and major employers within the Central Broward Transit Corridor. Existing land use information was collected within a half-mile radius around the two alignments from the Broward County Property Appraiser, and was verified using aerial imagery to the greatest extent possible. The analysis of future land use designations is based on the Broward County Planning Council's adopted Broward County Comprehensive Plan<sup>2</sup>. Both existing and future land use data is from 2011. The different existing land use categories were collapsed into representative types for the purposes of this analysis. Future land use categories were kept consistent with the Planning Council's. Employment data for the study area was collected from Nielsen's 2011 Business to Business Listings, and then used to identify major employers and employment areas along the alignment corridor. For more detailed information on land use and economic activity for both alignments, including acreage totals and location maps, see the *Central Broward East-West Transit Study Land Use, Activity Centers, and Major Employers Technical Memorandum*.

The effects of the proposed CBT project are expected to improve economic development opportunities and improve traffic flow and connectivity for the benefit of residents, businesses, and educational centers. All alternatives are consistent with local plans. They are consistent with DCA approved Broward County Comprehensive Plans, Broward County Comprehensive Development Master Plan, FDOT District Four Tentative Work Program pursuant to Section 339.135 4(f) Florida Statutes. The proposed alignments are consistent with the Comprehensive Broward MPO 2035 LRTP and local Broward MPO TIP, the State Implementation Plan for areas of ozone non-attainment, and the Broward MPO Congestion Management System within the federal TIP.

---

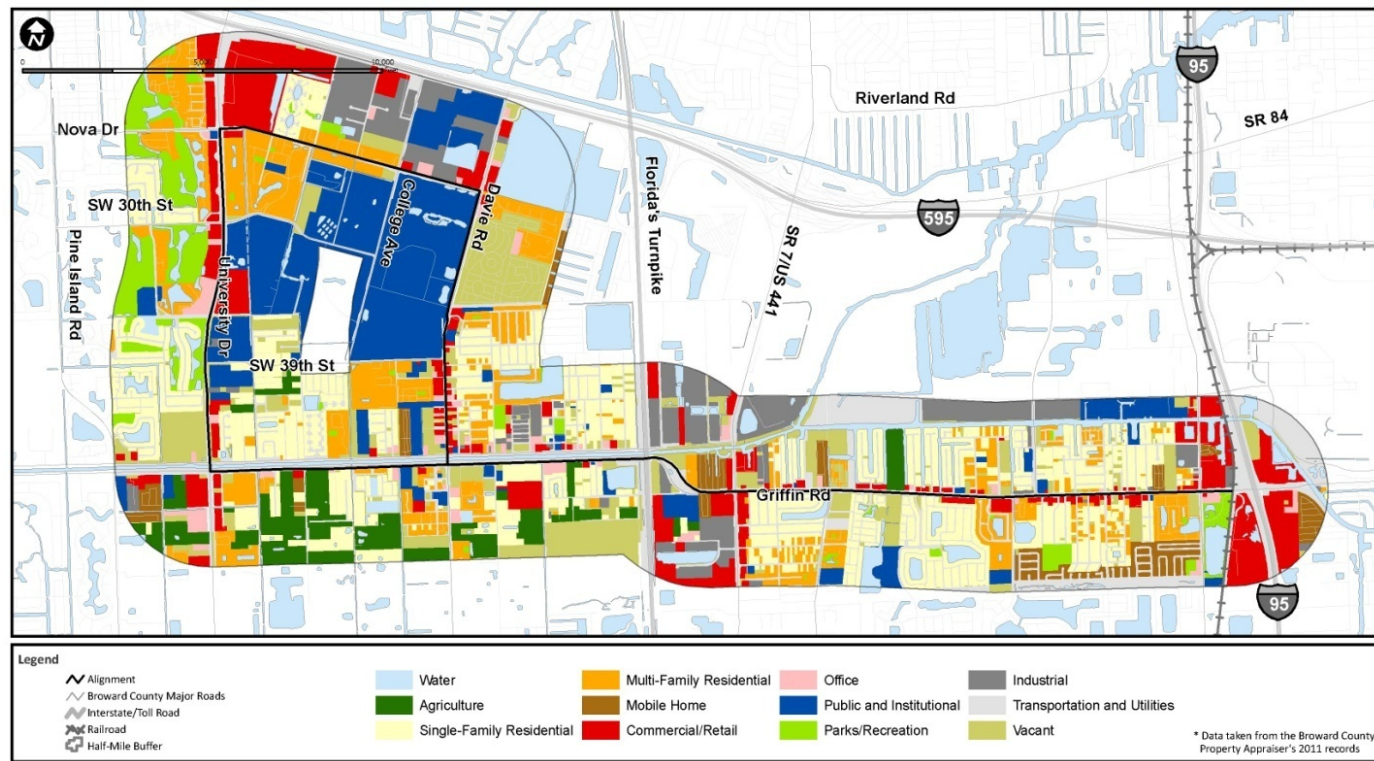
<sup>2</sup> Adopted 1989 and updated 2007.



### 4.5.1 Existing Land Use

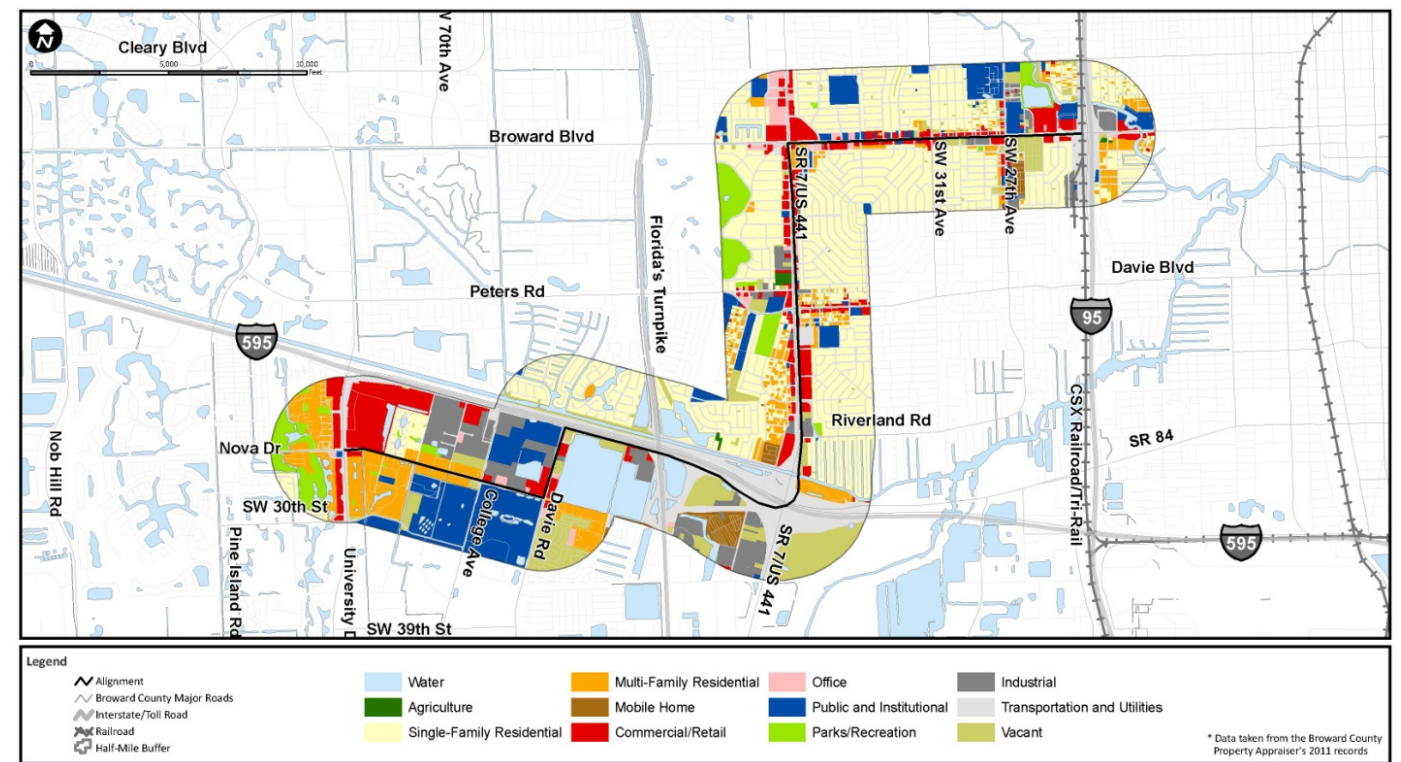
The predominant land use in the central segment unique to the Griffin Road Alternatives (other than transportation and utilities) is single-family residential. It is found most dominantly on both sides of Griffin Road between University Drive and Florida’s Turnpike, and again on both sides of Griffin Road from SR 7/US 441 to Anglers Avenue. These single-family neighborhoods are mostly non-gated communities or individual lots that are relatively large compared to other parts of the study area. The next largest land use in this segment is public and institutional use. Although found throughout, most of the public and institutional land is concentrated in the SFEC area around University Drive, Nova Drive, and Davie Road. Here, parts of Nova Southeastern University, Florida Atlantic University and Broward College combine to make up considerable segments of land adjacent to the alignment corridor. Multi-family residential, the next highest percentage of land use, is also found predominately in this area, providing close-proximity housing for students. It is also worth noting that agricultural land use, although not among the highest percentages, is considerably higher here than anywhere else along the proposed corridor. This agricultural land is found mainly on the south side of Griffin Road west of Florida’s Turnpike. The locations of these land use categories are shown in Exhibit 12.

Exhibit 12: Existing Land Use Along the Griffin Road Alternatives



As with the previous segment, the most common land use type in the central segment unique to the SR 7/Broward Boulevard (other than transportation and utilities) is single-family residential. It is located almost exclusively on the north side of I-595 and along both sides of SR 7/US 441 and Broward Boulevard. This segment contains, by far, the highest percentage of single-family residential land use acreage, which predominantly consists of neighborhoods with unrestricted access and medium to small lot sizes. The next most common land use is public and institutional. This, with the exception of several large schools and a cemetery along SR 7/US 441 and Broward Boulevard, is mostly due to the inclusion of the northern portion of the SFEC. Multi-family residential and commercial use, also among the most common use types, follow a spatial pattern similar to the public and institutional uses, but are located much closer to the proposed alignment along SR 7/US 441 and Broward Boulevard. The locations of these land use categories are shown in Exhibit 13.

Exhibit 13: Existing Land Use Along the SR 7/Broward Boulevard Alternative

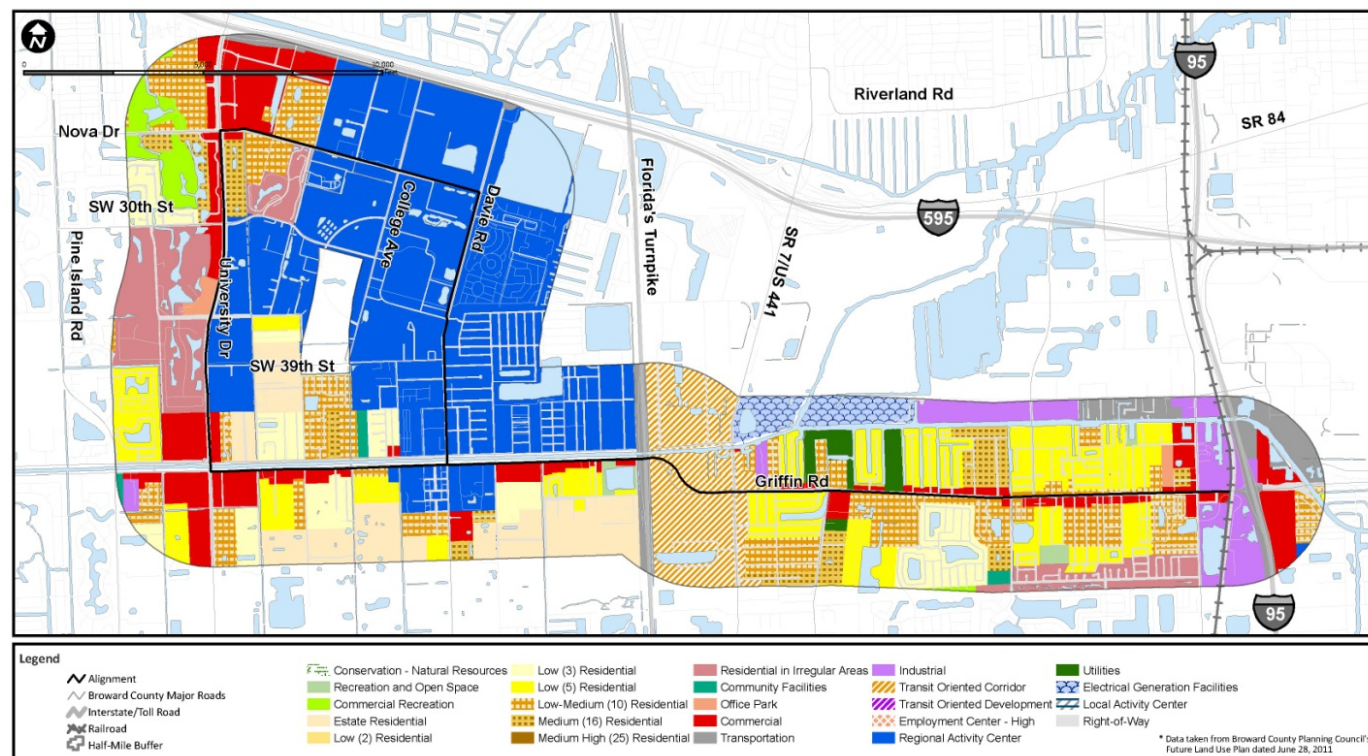




### 4.5.2 Future Land Use

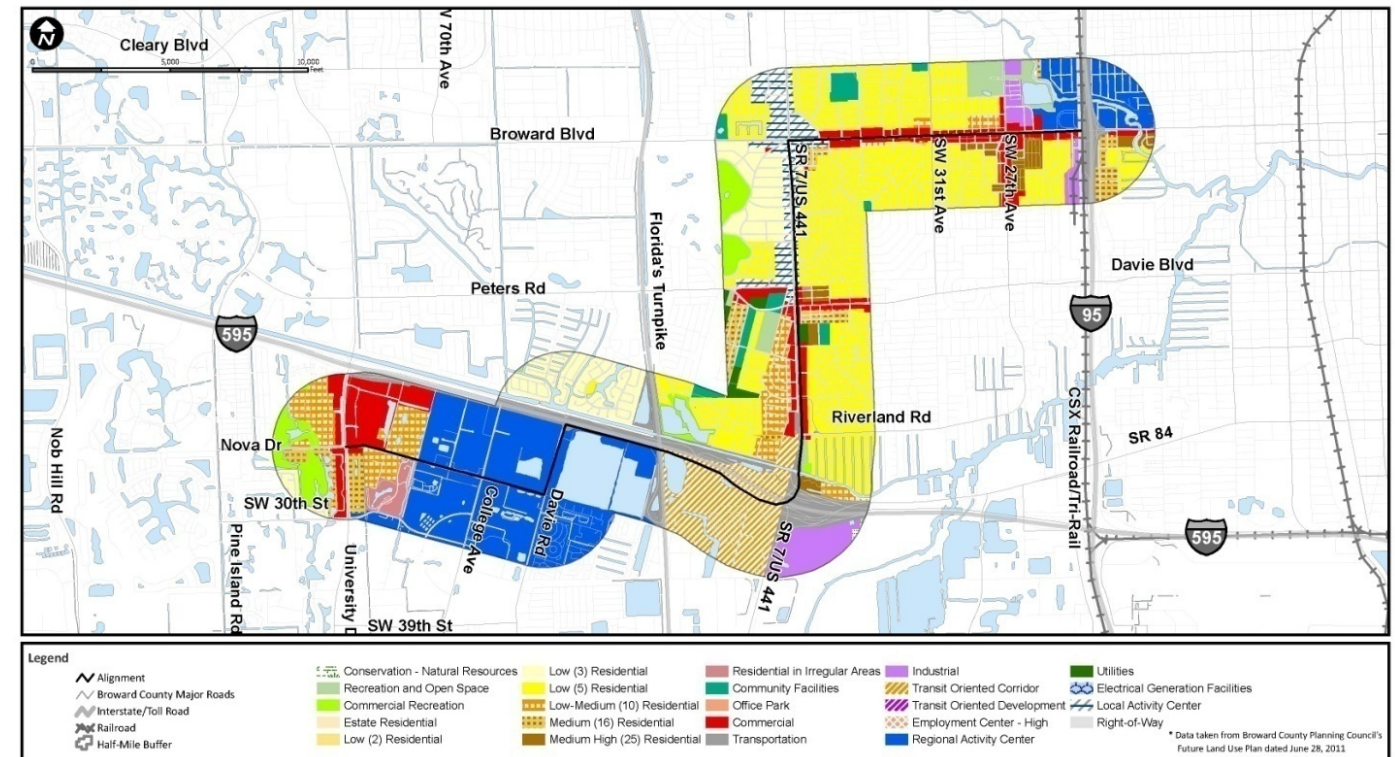
The most prevalent future land use designation in the central segment unique to the Griffin Road Alternatives is Regional Activity Center (RAC), which is located in the SFEC, and also extends roughly to I-595 north of Nova Drive, on the east side of Davie Road, and on the north side of Griffin Road to Florida’s Turnpike. There are also significant amounts of low and low-medium residential areas along University Drive and Griffin Road. Commercial land use is the next largest percentage, and is fairly consistent with existing commercial land use nodes at University Drive and Nova Drive, University Drive and Griffin Road, Griffin Road on the east side of I-95, and also running immediately adjacent to Griffin Road throughout much of this segment. There is also a large portion of land on both sides of Griffin Road between Florida’s Turnpike and SR 7/US 441 that is designated for future transit-oriented development. The locations of these land use categories are shown in Exhibit 14.

Exhibit 14: Future Land Use along the Griffin Road Alignment



Low-density residential is the largest future land use category surrounding the central segment unique to the SR 7/Broward Boulevard Alternative. It is located almost exclusively on both sides of SR 7/US 441 and Broward Boulevard, with a small section on the north side of I-595 west of Florida’s Turnpike. The next largest future land use category is RAC, which is located in the Town of Davie on the south side of I-595 just to the west of Florida’s Turnpike. With the exception of land dedicated to right-of-way (mostly I-595, Florida’s Turnpike, and I-95), the other future land use categories are relatively small, with none being higher than six percent of the entire segment. Of these less-dominant land use types, it is worth noting that a large area of land south of I-595 between SR 7/US 441 and Florida’s Turnpike is designated for use as a transit oriented corridor. This land is currently made up of vacant, industrial, and mobile home uses. The locations of these land use categories are shown in Exhibit 15.

Exhibit 15: Future Land Use along the SR 7/Broward Boulevard



### 4.5.3 Existing Employment

Employment in the central Griffin Road segment of the corridor is mainly concentrated along University Drive and along the eastern portion of Griffin Road. There are 109 major employers and 7,644 total employees in this segment. The largest is Watson Laboratories, located near Florida’s Turnpike in Davie, with 1,000 employees. The next largest are Gulfstream International Group and Ace Waste SVC with 350 and 300 employees, respectively.

Employment in the central SR 7/Broward Boulevard segment of the corridor is mainly concentrated on both ends. There is significant employment along Nova Drive and Davie Road south of I-595, and there is also significant employment on the eastern end of Broward Boulevard near I-95. There are 90 major employers and 6,154 total employees in this segment. The largest is the Broward County Sheriff’s Office, located on Broward Boulevard in Fort Lauderdale, with 500 employees. The next largest are Gunther Motor and Ace Waste SVC both with 300 employees.

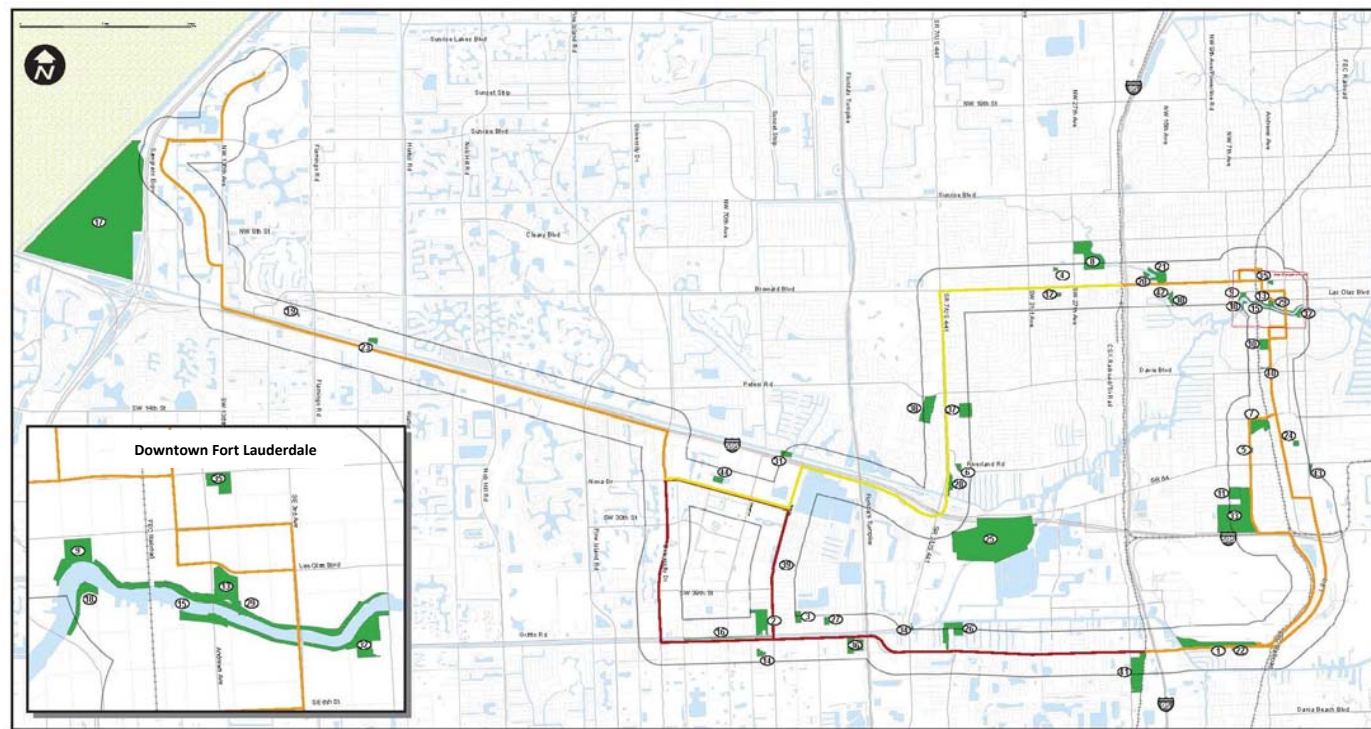


### 4.6. Parks, Recreation Land, and Open Space

Parks and public land were identified within a quarter-mile of both alignments. Features of these parks within the study area vary widely. They range from boat ramps, basketball courts, and education facilities to small, urban green-spaces with simple picnic areas. Most parks near or within the study corridor are towards the east end of the study area, where there are more suburban areas and several waterways. There is no difference in the number of park areas between the two alignments. There are a total of nine unique parks for each alignment that do not exist within the other. For the most part, the parks unique to each alignment exhibit similar sizes and locations relative to the respective alignments. The Griffin Road Alignment does, however, have slightly more park land within its quarter-mile corridor. Large portions of some of the parks along the SR 7/Broward Boulevard alignment are outside of this corridor boundary, and thus are further from the alignment. The locations of these park areas are shown in Exhibit 16.

Due to the use of existing right-of-way for all alternatives considered, no negative effects are anticipated to occur to any of the parks along the corridor. For additional details regarding the research methodology, names, and locations of the publicly-owned parks and recreation facilities, see the *Central Broward East-West Transit Study Parks and Public Land Technical Memorandum*.

Exhibit 16: Adjacent Parks, Recreation Land, and Open Spaces



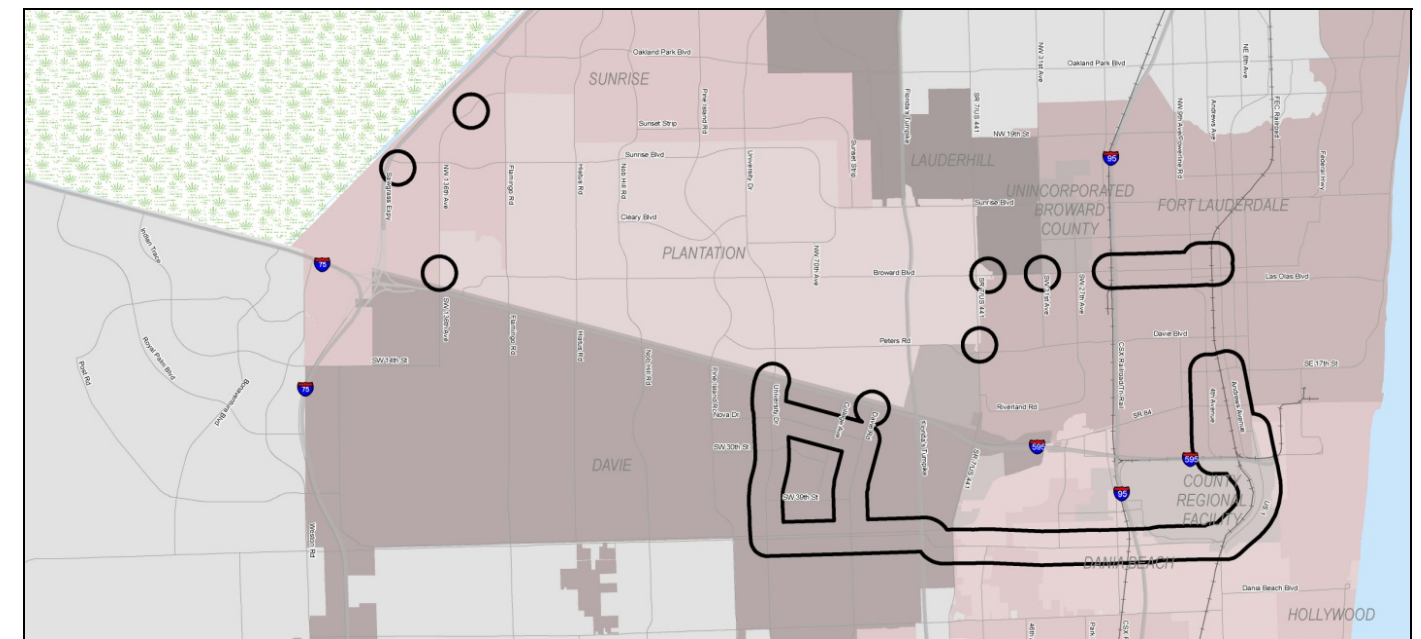
### 4.7 Visual and Aesthetics Quality

A review of the visual and aesthetic qualities within the study corridor was conducted to address potential effects to communities that border or could be affected by the Central Broward East-West Transit Study. The visual and aesthetic resources that comprise the physical features reviewed include:

- Landscaping
- Parks and recreation areas
- Agricultural areas
- Historic or other culturally significant resources
- Urban areas
- Water bodies and greenways
- Public facilities
- Business centers and office complexes
- Residential areas

An area of potential effect (APE) was then determined for the purposes of evaluating the possible effects to these features. Segments of the alignment in which premium bus would operate in existing right-of-way would not be affected, except in areas where new stations are proposed. The APE used in this review is shown in Exhibit 17. It includes all areas within a quarter-mile of alignment segments in which modern streetcar could be the preferred mode and also areas within a quarter-mile of proposed new station locations along the remaining segments. Because the central segment of the Griffin Road Alignment has the potential to operate as modern streetcar, the entire quarter-mile alignment corridor was reviewed, while only four station areas were reviewed for the central segment of the SR 7/Broward Boulevard alignment. The downtown segment, common to all alternatives that will eventually contain the Wave was not included in this review because the Wave is scheduled to precede the Central Broward East-West Transit Study, and no additional effects would be created in the area as a result of its extension.

Exhibit 17: Quarter-Mile Area of Potential Effect



For the purpose of analyzing the effects to the visual and aesthetics to the area, views of the aforementioned sensitive areas from the road and views of the road from these sensitive areas were considered. Any of the alternatives may have some visual and aesthetic effect as a result of the Study. Any effects unique to the SR 7/Broward Boulevard Alignment would likely occur at new station locations along SR 7 and Broward Boulevard, both of which are highly industrial or commercial areas in these locations.

The potential effect locations unique to the Griffin Road Alignment are larger due to the possibility of modern streetcar being the preferred mode throughout the central segment. While the goal is to use wireless streetcar technology, this may not be possible, resulting in some visual effect from the catenary system consisting of both poles and wires. This could affect the relevant segments of University Drive, Nova Drive, Davie Road, and Griffin Road that are specific to this alignment.

University Drive is a wide roadway with little landscaping in the median. Commercial strip malls with outparcels fronting the road generally provide the backdrop for the northern part of University Drive while the south side has some tall hedging, shielding the community from the existing major roadway. If the Griffin Road Alignment is selected, the Study team will work closely with the property owners along University Drive to ensure that adverse visual effects do not occur to their businesses or affect the residential areas.

Griffin Road is another wide roadway and the major considerations here are the C-11 canal/greenway/linear park on the north side of Griffin Road, west of Florida's Turnpike, the Aviation Linear Park on the north side of Griffin Road, along the Fort Lauderdale - Hollywood International Airport property, and the nicely landscaped medians. The south side of Griffin Road across from the airport is already walled by the communities, presumably in an effort to reduce the noise pollution. The Griffin Road Alternatives include use of the inside lanes, which may affect the median landscaping. Thus, in addition to working with property owners concerning visual effects to their businesses or from residential areas, the Study team will have to work closely with the municipal staff to address any modifications and mitigation that may be necessary to the median landscape areas.

The western portion of Nova Drive (west of College Avenue) is also a residential area, though with more multi-family communities, many of which have some hedging or walls to provide a barrier between the community and the road. The eastern portion of Nova Drive (east of College Avenue) has industrial/office parks on the north side and schools on the south side. The schools are set far back, and access to the schools is from College Avenue and Davie Road. Limited access points are available to the industrial office parks on the north side of Nova Drive, and hedging and a berm provide some barriers between the offices and the road.

The northern portion of Davie Road (north of SW 39<sup>th</sup> Street) has a school on the west side and is vacant on the east side. The southern portion of Davie Road (south of SW 39<sup>th</sup> Street) has more office and commercial space, with the Davie western theme throughout. Close coordination with the Town of Davie staff on the design of shelters and the transit system will be necessary if this option is carried forward as the Preferred Alternative.

There is greater potential for visual and aesthetic effects with the Griffin Road Modern Streetcar Build Alternative than either of the Premium Bus Build Alternatives. These effects are based on the addition of poles to support the power supply system for the modern streetcar, which are not necessary for bus operations. These potential effects may be offset by the use of wireless streetcar technology; however, a more detailed analysis will be completed as part of the environmental documentation for the Locally Preferred Alternative. For more information on the potential for visual and aesthetic effects for all alternatives, see the *Central Broward East-West Transit Study Visual and Aesthetics Technical Memorandum*.

## 4.8 Air Quality and Energy

Broward County is located within the U.S. Environmental Protection Agency's (EPA) designated Southeast Florida Airshed which consists of Miami-Dade, Palm Beach and Broward Counties. The Southeast Florida Airshed is currently designated as being in attainment of the National Ambient Air Quality Standards (NAAQS) under the criteria provided in the Clean Air Act. The attainment designation indicates that pollutant concentration levels in the ambient air are below the NAAQS for the six primary pollutants: carbon monoxide (CO<sub>2</sub>), lead, nitrogen dioxide, ozone, sulphur dioxide, and particulate matter. Given the area's attainment status, an air quality evaluation was not conducted as part of the LPA selection since all alternatives are anticipated to improve air quality by reducing the number of vehicles miles traveled (VMT), and thus emission levels.

As part of the ridership forecasting, system wide VMT was calculated for each Build Alternative. The reductions projected were similar. Therefore it did not provide a distinguishing factor to allow for differentiation between the Build Alternatives in terms of energy use or conservation.

## 4.9 Noise and Vibration

The potential for noise and vibration impacts for the project was assessed based on the methodology described in the FTA guidance manual "Transit Noise and Vibration Impact Assessment" (FTA-VA-90-1003-06, May 2006), and are dependent on the mode selected along with the LPA alignment.

### 4.9.1 Noise

Due primarily to the relatively high existing noise levels throughout the study area, no noise impacts are anticipated from streetcar operations on tangent (straight) sections of the alignment or from bus operations. Therefore, if premium bus were chosen as the preferred mode for the central segment of either alignment, there would be no difference between the two in terms of noise. If the Griffin Road Alignment were to be chosen with modern streetcar as the preferred mode, there is the potential for noise impacts to sensitive receptors near the curved sections surrounding the SFEC. Sensitive receptor types in this area include residential housing units and a funeral home. It is anticipated that these potential noise impacts could be eliminated by installing track lubrication systems at curves where wheel squeal may occur. Once the LPA is selected, a more in-depth analysis of potential noise impacts will be completed, and appropriate mitigation strategies identified, if necessary.

### 4.9.2 Vibration

Some vibration impacts are predicted from bus operations where sensitive receptors are located within approximately 30 feet of the nearest lane of the roadway where the bus would travel; however, vibration impacts associated with buses would not be greater than that which occurs from existing bus service. The potential for ground-borne vibration impacts on residential housing units would exist for the central segments of both alignments. No ground-borne noise impacts would be expected for the SR 7/Broward Boulevard Alignment if the Griffin Road Alignment were selected with premium bus as the preferred mode. If the Griffin Road Alignment were selected with modern streetcar as the Preferred Alternative, there is the potential for ground-borne noise and vibration impacts on residential housing units, a school, and a radio station. These potential impacts could be reduced through the incorporation of a resilient element in the track structure. Once the LPA is selected, a more in-depth analysis of potential ground-borne noise and vibration impacts will be completed, and appropriate mitigation strategies identified, if necessary.



The preliminary review for noise and vibration effects indicates that the Griffin Road Modern Streetcar Build Alternative has the potential for greater impacts; however, most of these potential effects can be addressed through track design. Further analysis of the potential for noise and vibration impacts will be completed as part of the environmental documentation for the Locally Preferred Alternative. For a more detailed description of the noise and vibration analysis for both alignments, see the *Central Broward East-West Transit Study Noise and Vibration Technical Report*.

### 4.10 Hazardous/Regulated Materials

Environmental Data Resources prepared *Environmental Atlas*, a corridor study report of regulated/hazardous activities, materials, sites, and facilities in the vicinity of the Study Build Alternatives. Supplemental sources such as the internet, city maps, and city directories were also used to identify hazardous/regulated activities, materials, sites, and facilities located within a quarter-mile of the proposed alternatives. Solid waste facilities and Comprehensive Environmental Response, Compensation, and Liability Act sites were identified within one mile of the proposed alternatives. Using the same data, sites within 250 feet on either side of the proposed alternatives which are potentially at “high-risk” of environmental contamination by hazardous substances were also identified. Identification of potentially “high-risk” sites was based on the database type (i.e. documented contamination and/or spills) and did not include a detailed review of individual records to assess current contamination condition.

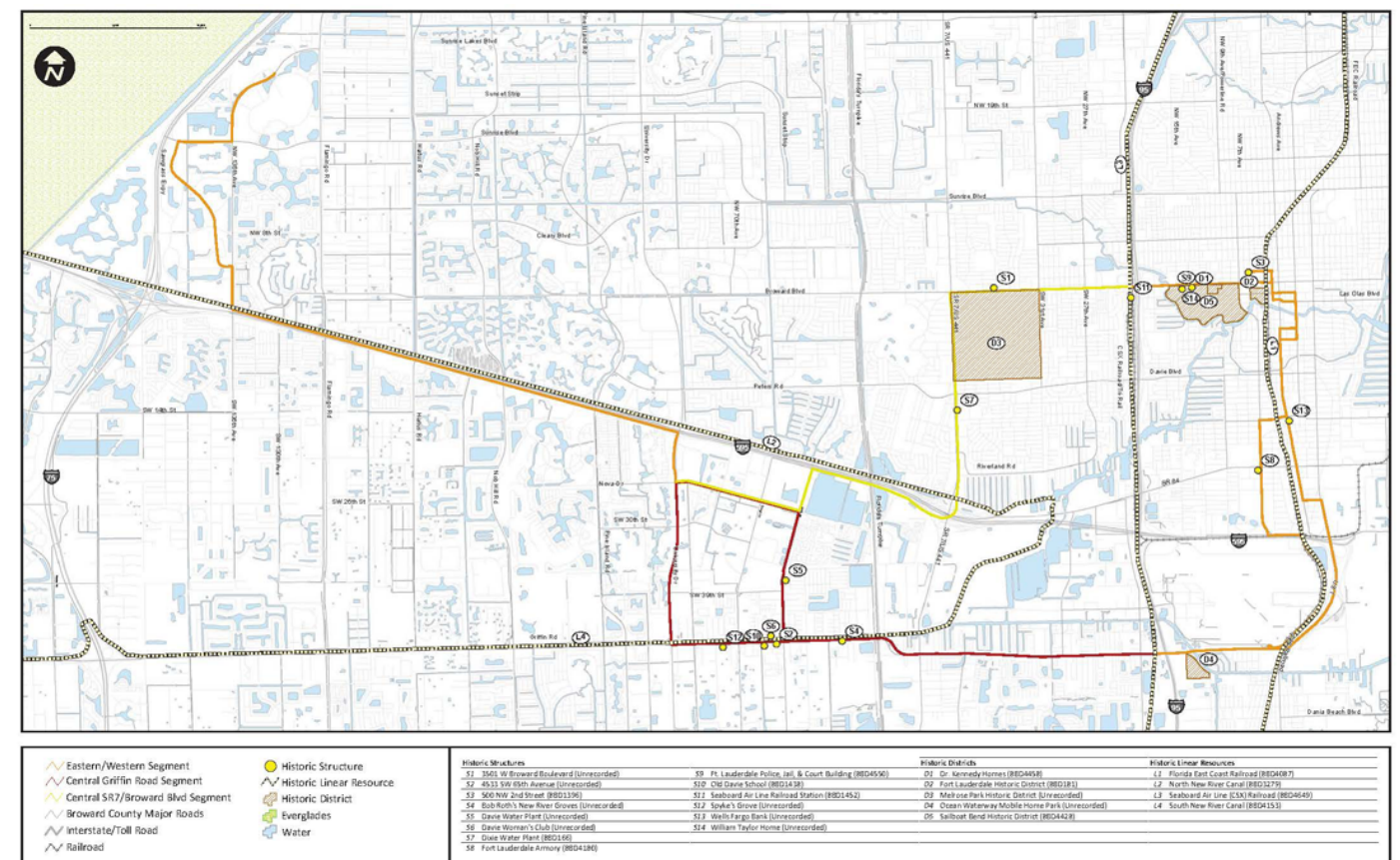
The number of regulated/hazardous activities, materials, sites, and facilities surrounding the SR 7/Broward Boulevard Alignment is slightly higher than surrounding the Griffin Road Alignment. Using the database search results, a total of 622 regulated/hazardous sites and 184 potentially “high-risk” sites were identified surrounding the segment unique to the Griffin Road Alignment. Alternately, 638 regulated/hazardous sites and 232 potentially “high-risk” sites were identified surrounding the segment unique to the SR 7/Broward Boulevard Alignment. This does not indicate that there would necessarily be more potential for impacts associated with the SR 7/Broward Boulevard Alignment. That determination is based on the type of regulated/hazardous facilities, the location of these in relation to the alignment, and the mode of travel. A more detailed analysis of the potential for impacts and the need for mitigation efforts will be conducted once an LPA is selected. For more detailed information on these sites and their locations in relation to both alignments, see the *Central Broward East-West Transit Study Preliminary Hazardous Materials Assessment Technical Memorandum*.

### 4.11 Cultural Resources

An historic resources reconnaissance survey and archaeological resources desktop analysis of the Build Alternatives was conducted in accordance with Section 106 of the National Historic Preservation Act of 1966 (Public Law 89-655, as amended), as implemented by 36CFR 800 (*Protection of Historic Properties*, effective January 2001); Chapter 267, *Florida Statutes*; Section 4(f) of the *Department of Transportation Act of 1966*, as amended (49 USC 303); and the minimum field methods, data analysis, and reporting standards embodied in the Florida Division of Historical Resources’ *Historic Preservation Compliance Review Program* (November 1990), *Cultural Resource Management Standards and Operational Manual* (February 2003), and Chapter 1A-46 (*Archaeological and Historical Report Standards and Guidelines*), *Florida Administrative Code*. In addition, this report was prepared in conformity with standards set forth in Part 2, Chapter 12 (*Archaeological and Historical Resources*) of the *FDOT Project Development and Environment Manual* (revised, January 1999). All work conforms to professional guidelines set forth in the *Secretary of Interior’s Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716, as amended and annotated).

The results of the survey identified 23 significant historic resources, including one National Register-listed resource, five resources which have been determined eligible by the State Historic Preservation Office for listing in the National Register, 16 resources that are considered National Register-eligible, of which eight are previously recorded, and one City of Fort Lauderdale locally designated resource that does not appear eligible for listing in the National Register. Of these 23 historic resources, 13 are common to all alternatives, seven are within the APE of the Griffin Road Alternatives, and three are within the APE of the SR 7/Broward Boulevard Alternative. Exhibit 18 shows the locations of these resources. Of the seven resources along the Griffin Road Alignment, six are historic structures and one is an historic linear resource (South New River Canal) that runs parallel to the alignment from University Drive to east of SR 7/US 441. Along the SR 7/Broward Boulevard Alternative, two of the resources are structures and one is an historic district (Melrose Park) that covers nearly one square mile of land on the southeast corner of SR 7/US 441 and Broward Boulevard. For more information on cultural resources adjacent to all alternatives, see the *Central Broward East-West Transit Study Historic Resources Reconnaissance Survey and Archaeological Resources Desktop Analysis Report*.

Exhibit 18: Cultural Resources



The archaeological resources desktop analysis identified four archaeological sites. Three of these sites are located in the eastern segment of the alternatives, and are therefore common to each. One site is located within or adjacent to the SR 7/Broward Boulevard Alternative, and while determined to be ineligible for listing in the National Register in 2006, may contain human remains.

The level of design provided at this phase of the study does not allow for sufficient evaluation of the potential impact to cultural resources. Therefore, it is not possible to distinguish between alternatives on the basis of impacts to archaeological and historic resources. A comprehensive cultural resource assessment survey will be conducted once an LPA is selected and further Section 106 work will be performed if necessary to avoid, minimize or mitigate adverse effects.

#### 4.12 Ecosystems

The study area is located in a highly-urbanized environment with minimal natural wildlife habitat remaining. The wildlife commonly found within the study area consists of those species adapted to life in highly-urban environments such as a variety of wading and passerine birds, squirrels, and small rodents. No rare plant species or plant communities were observed near either alignment. Existing vegetation consists of emergent species associated primarily with littoral zones of ponds and ditches, mowed urban grasses, scattered trees, and landscaping. Native vegetation within the proposed study area has been heavily impacted by commercial and residential development.

Two state-listed species, gopher tortoise (*Gopherus polyphemus*) and burrowing owl (*Speotyto cunicularia*), and one state and federally-listed species, West Indian (Florida) Manatee (*Trichechus manatus latirostris*), have been documented within one mile of the study alignments. During field reviews, none of these species or suitable habitats was observed within or immediately adjacent to the alignments. One historic wading bird rookery, last recorded as active in the 1970s, was also documented to the southeast of the SR 7/Broward Boulevard alignment, within the Pond Apple Slough Natural Area. No impacts to these habitats are anticipated. Two active wood stork (*Mycteria Americana*) nesting colonies are located within 18.6 miles of the study corridor. Wetlands in the Study vicinity are therefore considered "Core Foraging Areas" for woodstork, and appropriate mitigation for any impacts to these areas will be required.

Field surveys conducted in May and December of 2006 and February of 2012, observed two state-listed wildlife species, white ibis (*Eudocimus albus*) and little blue heron (*Egretta caerulea*), and one state and federally-listed wildlife species, the wood stork. White ibis and little blue heron are listed by the state as species of special concern, and woodstorks are state and federally-listed as endangered. All three species were observed foraging along the edges of ditches, canals or retention ponds adjacent to the study alignments. No nesting areas are known to exist adjacent to the study alignments. All species were either observed near segments common to both alignments or near the Griffin Road segment. There were no species observations near the segment unique to the SR 7/Broward Boulevard Alignment. The species observed along the segment unique to the Griffin Road Alternatives were little blue heron and woodstork. A comprehensive Endangered Species Biological Assessment will be completed as part of the NEPA phase of the Study. The potential for impacts and any necessary mitigation will be identified as part of that effort. For more detailed information on wildlife and habitat observations and database results, see the *Central Broward East-West Transit Study Threatened and Endangered Species, Surface Waters, and Wetlands Technical Memorandum*.

#### 4.13 Water Resources

The study area contains many natural and artificial navigable waterways, wetlands, and surface waters. Wetlands are those areas that support natural or altered wetland systems, with the accompanying wetland vegetation, hydrology and soils. These include riverine systems traversed by the Study, wetlands created as mitigation areas, and remnants of native wetlands that historically occurred within the Study right-of-way. Only wetlands and surface waters immediately adjacent to or crossing the alignments were identified for the purposes of establishing relevant existing conditions. Natural navigable waterways include the North Fork New River and Tarpon River.

Artificial systems include Dania Cut-off Canal, North New River Canal, and South New River Canal. Boating facilities such as docks and small marinas occur on the North Fork New River, Tarpon River, Dania Cut-off Canal, and the North and South New River Canals east of their locks and water control structures. The North New River Canal and South New River Canal are not classified as navigable west of their locks and water control structures.

A high potential for wetland and surface water impacts is not anticipated for either alignment despite the presence of considerably more surface water and wetlands along the Griffin Road alignment. There are forty-five bodies of surface water and seven wetlands found immediately adjacent to the unique segment of the Griffin Road Alignment right-of-way, and only sixteen bodies of surface water found adjacent to the corresponding SR 7/Broward Boulevard Alignment segment. There are no wetlands adjacent to the central segment of the SR 7/Broward Boulevard Alternative. Since all of the alternatives are utilizing existing right-of-way, including existing bridge structures, the potential for impacts to water resources is low. A thorough analysis of the potential for impacts, including during construction, will be completed as part of the NEPA phase of the Study, once an LPA is selected.

More information about neighboring water resources, including names and locations, can be found in the *Central Broward East-West Transit Study Threatened and Endangered Species, Surface Waters, and Wetlands Technical Memorandum*.

#### 4.14 Floodplains and Drainage

##### 4.14.1 Floodplains

The South Florida region has a flat topography and sandy soils that become saturated after heavy rains. Flooding in this part of the country usually results from slow infiltration and runoff. Flat topography combined with heavy land use and intense rainfall events have resulted in periodic flooding throughout the region. The Federal Emergency Management Agency (FEMA) has created floodplain maps for thousands of cities, counties and villages to identify flood-prone properties, and to define areas where management of floodplain development is necessary. After reviewing the Digital Flood Insurance Rate Maps supplied by FEMA, it was determined that the alignments go through flood zones AH, AE, X, and X500. While both unique segments to the Griffin Road and SR 7/Broward Boulevard alignments contain flood zones AH and AE, meaning those areas are within the 100-year floodplain and are prone to flooding, the central SR 7/Broward Boulevard Alignment segment has considerably more land classified as flood zone X, reflecting the fact that the area has a slightly higher elevation and is less likely to be inundated by a 100 or 500-year flood.

FEMA is currently in the process of updating flood zone boundaries and base flood elevations (BFE) for Broward County. The appeals and review process took place during the first half of 2012, but the new boundaries and elevation data have not yet been finalized or adopted by FEMA. Because of this, the existing floodplain data from 1996 was chosen for this analysis. As the Study moves forward all efforts will be made to ensure that any new occupied structures, such as stations, are constructed so that the finished floor elevations are above the most recent BFE for Broward County. For more information on floodplain boundaries for both alignments, see the *Central Broward East-West Transit Study Soils, Drainage Basins, and Floodplains Technical Memorandum*.

##### 4.14.2 Drainage Basins

The alignment corridors cross a total of eight Broward County drainage basins: C-10, C-11 East, C-11 West, C-12 East, C-12 West, North New River Canal East, North New River Canal West, and Coral Reef. The unique segment of the Griffin Road Alignment crosses two drainage basins: the C-11 East and Coral Reef Basins. The unique



segment of the SR 7/Broward Boulevard Alignment crosses five drainage basins: the C-11 East, Coral Reef, North New River Canal, C-12 West, and C-12 East Basins. For more detailed descriptions and locations of these drainage basins, see the *Central Broward East-West Transit Study Soils, Drainage Basins, and Floodplains Technical Memorandum*.

The SR 7/Broward Boulevard Alignment is not anticipated to affect any of the five drainage basins included within its corridor. Appropriate stormwater management techniques would be employed during the construction of station areas, and the amount of new impervious surface created would be limited to those station areas and able to be addressed either through existing drainage systems or through minor modifications to these systems.

The Griffin Road Alignment has a greater potential to affect drainage in the C-11 basin since the conceptual designs prepared at this point in the Study include the reconstruction of University Drive from Nova Drive to Griffin Road, depending upon the design option ultimately selected. If the Build Alternative selected includes the use of University Drive from Griffin Road to Nova Drive, the current concepts include the creation of exclusive transit lanes that would require the replacement of the existing swales with underground piping. These concepts are the same for either modern streetcar or premium bus. In addition to these changes, the station areas would need to be addressed similar to the SR 7/Broward Boulevard Alternative. It is not anticipated that these potential drainage effects would result in considerable environmental impacts; however, this will be evaluated during the NEPA phase if the Griffin Road alignment is selected as part of the LPA.

#### 4.15 Geological Resources

Soils vary throughout the study area, but are overall typical of the soil composition found in the southeast part of Florida. Information on soil composition was obtained from the U.S. Department of Agriculture Natural Resources Conservation Service. The proposed alignments are surrounded by several soil associations, including Arents, Basinger, Dade, Dania, Duette, Hallandale, Immokalee, Lauderhill, Margate, Matlasha, Okeelanta, Paola, Pennsuco, Perrine, Plantation, Pomello, Pompano, and Sanibel. Among these different soil associations, there are also a variety of soil types, which are derived by the composition of the soil (a mixture of sand, silt and clay). The area surrounding the central segments of both alignments cover a wide variety of soil associations and types, with the most common being different variations of Fine Sand and Urban Land Complex. The SR 7/Broward Boulevard Alignment consists of more Urban Land Complex soil types, especially the portion of the alignment that is north of Riverland Road. The soil along the Griffin Road Alignment is less homogenous, but consists mostly of Fine Sand soil types. Because the study area is a mostly built-out urban and suburban environment and the CBT project would occur within existing roadway right-of-way, these surrounding soils would not have a significant effect on implementation. More information about the soil composition for both alignments can be found in the *Central Broward East-West Transit Study Soils, Floodplains, and Drainage Basins Technical Memorandum*.

#### 4.16 Safety and Security

Safety and security, while vitally important to any transit program, are not key factors in the selection of an LPA for this project. The public perception regarding the potential risk to safety resulting from modern streetcars sharing the roads with automobiles is often greater than the risks that actually exist. Since all alternatives include modern streetcar, the risk is relatively the same for both. The only difference is the extension from the Griffin Road Tri-Rail station to the SFEC when modern streetcar is considered, thereby creating a longer distance over which streetcars and automobiles will interact. Both transit vehicles, bus and streetcar, will follow the same rules as vehicular traffic. The streetcar will operate just like a bus and will not require special gates, bells or other protections; except perhaps in instances where conflicts with left turns may exist. These potential conflicts will be addressed during the design phase.

Perhaps the greatest risk to safety that will be mitigated through public outreach and signs will be the implementation of transit signal priority and changes to signal timing to allow for the transit vehicle to move from median to curbside configurations. Both of these will be new operating conditions for most drivers in Broward County. Further, sharing the road with a streetcar will be a new experience that may unsettle many drivers during their first few encounters. As the selected alternative advances in the project development process, all applicable safety standards and requirements will be applied to minimize the risk of personal and property injuries. As the CBT project moves into construction, public outreach campaigns will be launched to make drivers aware of the changes that will result from the new transit system.

Security for transit patrons will be similar to what is currently provided by the existing transit operators in Broward County. Both BCT and the SFRTA provide security personnel on their vehicles. Security at stations is provided by the applicable jurisdiction. Passenger security is a concern for many of the participants at the Study's outreach events, as well as the elected officials from the jurisdictions through which the alignments pass. As the Study moves into the next project development phase, more emphasis will be placed on identifying appropriate security policies and procedures.

#### 4.17 Utilities

The evaluation of utilities identifies the location of utilities within the proposed study corridor, types of utilities, and owner for the purposes of determining potential effects of the proposed project. Utility owners were identified through Sunshine One, Florida's not-for-profit call center charged with helping prevent damages to underground utilities. Letters were then sent to each of the owners requesting information on the type, size, and general location of any utilities, as well as the approximate boundaries of any easements or other compensatory interest in lands they may hold along or across the alignment right-of-way.

Utilities within right-of-way owned by the FDOT are regulated in accordance with the FDOT Utility Accommodation Manual, October 2007 as authorized under Florida Administrative Code, Section 337.401-337.404, and Florida Statutes Rule 14-46.001. The purpose of the Utility Accommodation Manual is to regulate location, manner, installation and adjustment of utility facilities, across, or on any Transportation Facility under the jurisdiction of FDOT. Utilities that lie within right-of-way owned by the Town of Davie, City of Sunrise, City of Fort Lauderdale, City of Plantation, City of Lauderhill, City of Dania Beach, or unincorporated parts of Broward County are subject to individual franchise agreements issued by the Cities, Towns, or County. Franchise agreements may not, however, limit or interfere with various city and town ordinances which regulate the placement, maintenance, and relocation of utilities within public right-of-way.

Common utilities found along the alignment right-of-way are fiber optic cable, water mains, gas mains, sewer systems, and FPL transmission and distribution lines. Most utility conflicts would likely occur in the eastern portion of the study corridor that is common to all alternatives. The presence of downtown Fort Lauderdale, the Fort Lauderdale-Hollywood International Airport, and Port Everglades also increases the number of utilities in the area. However, the utility information received so far is not comprehensive and not complete. Requested information is still pending, and is required to determine whether there may be a potential conflict with utilities located in the proposed alignment right-of-way. Further utility coordination will be initiated once an LPA is selected, the CBT project moves into preliminary engineering, and surveys are conducted. For information on the utility information collected to date, see Part II, *Conceptual Design Report, Section 4.4*.

## 4.18 Transportation Systems

### 4.18.1 Transit Service, Operations, and Ridership

Broward County has a variety of transit services, both existing and planned, that will coincide with and facilitate the Central Broward East-West Transit Study regardless of what alignment is selected. Tri-Rail and BCT's express bus service, local bus service, and community shuttles all provide an integral transit framework for the study area. Once an LPA is selected, more detailed operating plans will be defined through coordination with BCT and the SFRTA.

In terms of connections to existing service, both the Griffin Road and SR 7/Broward Boulevard Alternatives provide the same number of potential connections to the transit systems in the study area. Both alignments cross twenty-four local bus routes (not including an additional seven proposed new routes by 2035) and fourteen community shuttle routes, including shuttle services provided by local municipalities, the Florida Housing Authority, the SFEC, and the SFRTA. Additionally, both alignments have the potential to share stop locations with eight express bus service routes and two Tri-Rail stations. More information about existing and planned transit service within the study area can be found in the *Central Broward East-West Transit Study Transportation Systems Technical Memorandum*.

### 4.18.2 Effects on Roadway and Traffic

A microsimulation traffic analysis was performed to assess the operational impacts and benefits of the SR 7/Broward Boulevard Alternative and the Griffin Road Alternatives. A separate model was created for the AM and PM peak periods for each of the alternative scenarios. After all data was added, assumptions were made, and the models were run, the following measures of effectiveness (MOEs) were used to assess each alternative:

- Percent difference in auto travel time with and without premium transit service in place
- Percent difference between transit and auto travel times
- Total transit travel time between route termini
- Change in total intersection delay with and without premium transit service in place

A review of the MOEs listed above produced the following findings:

- From an automobile standpoint, shorter travel times are experienced during the AM peak period for all of the alternatives. For the PM peak period, the Griffin Road alignment with Premium Bus provides the largest travel time savings.
- The alternatives perform relatively similarly in terms of total transit travel time and transit travel time savings (when compared to automobile travel time). The potential exists for shorter transit travel times and improved travel time savings with the Griffin Road alignment due to the possibility of exclusive transit lanes with these alternatives.
- Although additional delay will occur on some of the cross-street approaches with the implementation of TSP, it is not considerable enough to adversely impact the overall operation of the intersection to unacceptable conditions.

For more detailed information about the traffic analysis, see the *Central Broward East-West Transit Study Microsimulation Alternatives Analysis Technical Memorandum*.

### 4.18.3 Effects on Bicycle and Pedestrian Facilities

Generally, most of the streets that make up both alignments have continuous sidewalks at least on one side. Southeast 30<sup>th</sup> Street and US 1 are lacking sidewalks. Similarly, most of the streets have some type of bicycle facility, either a marked bikeway, wide curb lane or paved shoulders.

Future bicycle and pedestrian improvements are planned within the proposed transit corridor. These plans include the Broward County Greenways Plan, Broward Boulevard Livable Mobility Plan, and the South Andrews Avenue Master Plan and Development Guide. For more information about the existing and planned facilities, see the *Central Broward East-West Transit Study Transportation Systems Technical Memorandum*.

Once an LPA is selected, pedestrian and bicycle access to the station areas, as well as the potential for impacts to these facilities resulting from the alternative, will be evaluated in more detail.

### 4.18.4 Effects on Parking and Vehicular Access

Facilities with substantially large parking capacity that are immediately adjacent to the proposed alignments of the Central Broward East-West corridor include the Sawgrass Mills Mall, BB&T Center, Ikea, downtown Fort Lauderdale, and the Fort Lauderdale-Hollywood International Airport. In addition, downtown Fort Lauderdale has a variety of parking options in publicly or privately owned surface parking lots or parking garages. There are approximately 14,000 parking spaces available to the public in parking garages, and 553 parking spaces in parking lots managed by the City<sup>3</sup>. Privately owned parking surface lots information was not available. More information about the number of parking spaces at the other activity centers is available in the *Central Broward East-West Transit Study Transportation Systems Technical Memorandum*.

Parking available in the SFEC was not included since the majority requires parking permits or other passes to access. The proposed alignments are not expected to effect the provision of parking at any of these activity centers, except for the BB&T Center. With the western terminus being considered for the BB&T Center, there have been discussions with the property owners about utilizing a portion of their parking for the station. The I-595 Express Bus is utilizing a portion of this site for their park-and-ride needs. As this Study moves into the environmental analysis, the Study team will work closely with all of the stakeholders to determine if additional park-and-ride spaces are needed in this location.

On-street parking is allowed only on one segment of the proposed alignments, on Andrews Avenue from SE 17<sup>th</sup> Street to SE 30<sup>th</sup> Street. Since the modern streetcar would be operating in mixed traffic on this segment of Andrews Avenue, there are no anticipated effects to the on-street parking.

### 4.18.5 Effects of Freight Service

The evaluation of effects on freight infrastructure included the collection of data on volumes and operations from various sources produced by the Broward MPO and, where available, data obtained directly from private freight operators. Broward County has designated four key freight/industrial zones within the County. The proposed Central Broward East-West Transit Study corridor passes through two of these zones - the I-595/Airport Zone (Mega Transport Zone) and the Sawgrass/I-75 zone.

<sup>3</sup> FDOT District Four, *Downtown Fort Lauderdale Parking Study*, April 2003.



#### 4.18.6 Rail

The study corridor is bisected by two north-south freight corridors: the FEC Railway and CSX which operates on the same tracks as Tri-Rail.

##### *Florida East Coast Railway*

The FEC corridor runs in the eastern side of the county and intersects the Central Broward Transit corridor in downtown Fort Lauderdale near the Central Broward Terminal. It then parallels the proposed Central Broward East-West Transit alignment from downtown Fort Lauderdale south to the Fort Lauderdale-Hollywood International Airport. Proposed Central Broward East-West Transit routings using Griffin Road are associated with an additional at-grade crossing of the FEC either on Griffin Road near US1 immediately south of the airport or north of the airport and FEC Intermodal Facility at SW 17<sup>th</sup> Street.

The FEC corridor provides direct service to the Fort Lauderdale-Hollywood International Airport and Port Everglades. The line does not have passenger service on it at this time. A study is underway by FDOT to evaluate potential future passenger service using the FEC right-of-way. The FEC has also proposed its own passenger service, *All Aboard Florida* that would provide passenger rail service from Miami to Fort Lauderdale, West Palm Beach, and Orlando.

The FEC line is used to transport more than 20 million gross ton-miles<sup>4</sup> per track mile per year. Most traffic on the FEC passes through Fort Lauderdale, to and from FEC's Miami facilities; however, several trains a day terminate and originate in Fort Lauderdale. Road trains, which transport freight cars between cities, and local trains, which deliver product to customers and pick up empty cars, are both operated within the study area.

Based on peak headways of 10 minutes in each direction and off-peak headways of 15 minutes in each direction, the proposed transit service would cross the FEC at each location 12 times per hour during peak hours and 8 times per hour during the off-peak hours. Because the proposed transit services would be generally operating in mixed traffic and controlled by the traffic signal network, effects to the rail freight network are expected to be minimal.

##### *CSX*

CSX freight trains in the study area are operated on the state-owned South Florida Rail Corridor (SFRC) that generally runs parallel to I-95. The SFRC is a 72 mile section of the historic Seaboard Air Line railroad. The SFRC was owned by CSX before being purchased by the State of Florida. CSX Corporation maintains exclusive track rights on the corridor and dispatches the passenger and freight trains within the corridor. Depending on the alternative selected, the Central Broward East-West Transit corridor crosses the SFRC either in the vicinity of Broward Boulevard and I-95 interchange on an overpass or at-grade on Griffin Rd east of I-95. Tri-Rail and Amtrak passenger rail services are operated concurrent with freight trains on the SFRC.<sup>5</sup>

CSX operates three to six road trains per weekday amounting to between 10 and 20 million gross ton-miles per track mile per year. The available data, from August 2006, indicates that on a typical weekday, CSX operated two to three northbound and two to three southbound road trains. CSX road trains in the study area are operated at night or in the early morning in the window between the last Tri-Rail train in the evening and first Tri-Rail train

the next morning. Approximately two-thirds of the CSX road cars operated in the study area are aggregate trains carrying 80 loads of rock. The remaining one-third of road trains are manifest freight consisting of 30 to 90 box cars.

Two local trains are based out of CSX's Fort Lauderdale yard, which is located south of the Fort Lauderdale Tri-Rail station, and are operated at night as required. Local trains generally make round-trips to and from the yard where they are based, although, in a few cases CSX's local trains were observed to lay-up in a different location from which the train initiated or were combined with other trains (both local and road trains). Because the corridor is partially dedicated to Tri-Rail passenger service, future CSX freight growth is somewhat restricted by Tri-Rail operating time frames. Any future freight growth along the corridor would, then, be restricted to a level that does not negatively affect the passenger rail schedule during the peak commuter operating periods.

All Build Alternatives would cross the SFRC at-grade along Griffin Road in the vicinity of the Fort Lauderdale-Hollywood International Airport Tri-Rail Station. The at-grade crossing would occur 12 times per hour during peak hours and 8 times per hour during the midday. Because the proposed transit services would be generally operating in mixed traffic and controlled by the traffic signal network, effects to the rail freight network are expected to be minimal.

#### 4.18.7 Trucks

There is one major trucking facility in the Central Broward East-West Transit corridor located at the FEC intermodal facility. This facility, owned and operated by the FEC Railway, uses Andrews Avenue as its main truck access to the roadway system. The density of service on Andrews Avenue adjacent to the trucking facility would be 12 vehicles per hour during the peak and eight vehicles per hour during the off-peak.

According to annual average daily traffic (AADT) counts for trucks in Broward in 2006, the highest truck volumes occur on the interstate highways, including the portion of I-595 between the Turnpike and I-95. While the SR 7/Broward Boulevard Alternative would operate over this portion of I-595 for approximately two miles, the Griffin Road Alternatives would not use I-595 over the portion with higher truck traffic volumes. For more detailed information on freight operations in the study area, see the *Central Broward East-West Transit Study Transportation Systems Technical Memorandum*.

<sup>4</sup> Gross ton-miles include the weight of locomotive and other rolling stock.

<sup>5</sup> Tri-Rail operates 50 trains per weekday with approximately 20 minute headway service during peak periods and approximately one hour headways during off-peak while Amtrak operates four trains per weekday (Silver Star and Silver Meteor routes between Miami and New York) on the SFRC.

## 5.0 Public Comment and Agency Coordination

### 5.1 Public Involvement Overview

The Central Broward East-West Transit Study has implemented a continuous and comprehensive Public Involvement Program including public outreach initiatives as well as stakeholder and agency coordination. From April 2008 to June 2010, the Program focused on initially developed alternatives that were since updated by the Broward MPO which is documented in the Interim Conceptual Design Report. This chapter summarizes the efforts undertaken once the Broward MPO adopted a new approach to the Study, focusing on the SR 7/Broward Boulevard and Griffin Road alignments, from June 2010 through the summer of 2012.

#### *Public Involvement Efforts to Date*

- *100+ Stakeholder Meetings*
- *75+ HOA & Community Meetings*
- *5 Public Scoping Workshops*
- *23 Presentations to the Broward MPO*

The Study team used a variety of methods to provide Study information to the stakeholders and public, and the opportunity to ask questions and offer comments. The Program included traditional public outreach methods such as public meetings/workshops, agency and stakeholder coordination, newsletters and a study website. To enhance outreach efforts non-traditional methods, such as attending homeowner association meetings, distributing flyers and meeting notices via door hangers in rental communities or at local businesses along the alignments, and coordination with local churches were also used.

### 5.2 Outreach Tools

In addition to the in-person efforts, a study website ([www.centralbrowardtransit.com](http://www.centralbrowardtransit.com)) provides frequent updates on the study status as well as access to all of the presentation materials and documentation developed through the course of the Study. The website also allows interested members of the public to join the Study mailing list, posts their experiences, request additional information, and send comments to the Study team among other things.

### 5.3 Public Outreach and Stakeholder/Agency Coordination

#### 5.3.1 Executive Committee

An Executive Committee was formed in January of 2011 to insure coordination among the transportation partners, consistency with local, regional and state transportation plans, and provide direction for the Study, especially at major milestones. The Committee was comprised of the leadership of BCT, the Broward MPO, FDOT District Four, and the SFRTA. The Executive Committee has met once per quarter, for a total of six meetings since its inception.

An MOU was signed by each of the agencies to solidify this process. The MOU is effective through the environmental phase of the Study, and is included as Appendix A.

#### 5.3.2 Technical Advisory Group

The TAG was developed in 2009 to engage various stakeholders during the NEPA environmental analysis phase and address technical issues, provide endorsement of technical analysis, and participate in public outreach efforts. The TAG is comprised of representatives from:

- Jurisdictions within the study area;
- Unincorporated Broward County;

- Transportation agencies;
- Activity centers within the study area, including the Sawgrass Mills Mall, Sawgrass Corporate Park, SFEC, Plantation Midtown, Plantation Gateway, and the Downtown Development Authority of Fort Lauderdale; and
- Not-for-profit agencies and community organizations with an interest in transportation issues.

Since its inception, the TAG has met eight times. The topics and results of the first five meetings are documented in the *Central Broward East-West Transit Study Interim Conceptual Design Report*. Since June 2010, three more meetings of this group have occurred. They are listed in Appendix B.

Additional meetings of the TAG will be held during the environmental phase of the Study to insure coordination on refinements to the preferred Build Alternatives, potential impacts associated with the preferred Build Alternative, and proposed mitigation strategies.

#### 5.3.3 Homeowner Associations and Civic Groups

In an effort to increase public engagement for the Study, the Study team attended homeowner association and civic group meetings to take the details of the Study to the people instead of relying on their attendance at one of the study-specific public meetings. The Study team attempted to provide information to every homeowner association and civic group along the alignments by reaching out via telephone calls, mailings, and e-mails. A list of the groups that the Study team provided presentations to is provided in Appendix B.

#### 5.3.4 Elected Officials Meetings

Meetings with elected and appointed officials were held prior to presentations to the Broward MPO Board. The purpose of these meetings was to provide an opportunity to review Study information and allow for questions or comments that the Study team could address during the Board presentation. Additionally, the Study team presented to municipal councils or commissions as requested to provide updates on the Study. Frequent updates were provided to the Broward MPO and advisory groups known as the Technical Coordinating Committee and the Community Involvement Roundtable. A list of meetings held with elected officials can be found in Appendix B.

#### 5.3.5 Agency Coordination

When requested, the Study team met with agency staff to provide updates on the Study or to discuss specific topics. A list of these meetings is available in Appendix B.



## 5.4 Corridorwide Public Meetings

Two rounds of public meetings were held since June 2010. Based on the length of the corridor and the separation between the two alignments, two meetings locations were used during each round to allow for maximum participation. For both rounds, the meetings were held at the West Regional Library in Plantation and the International Game and Fish Association Fishing Hall of Fame and Museum in Dania Beach. Both of these locations are readily accessible by public transit and meet ADA requirements.

The first round of meetings, held in October 2011, was specifically designed to share the new alternatives with the public. The goal was to obtain public comment on both the alignments and the technologies being proposed. This first round of meetings was well attended, with over 70 participants. Overall, the participants were supportive of the Study and the majority of the questions were focused on when the Study would be built and how it would be funded.

The second round of meetings, held in April 2012, focused on the analysis results and sought to obtain public comment on a Preferred Alternative. The attendance at these meetings was higher, with over 105 participants. As with the previous round of meetings, the participants were supportive of the Study and their questions were focused on the Study's timeline and funding. There was more discussion about potential station areas and the benefits of rail transit regarding economic revitalization and development. Based on the written comments provided, the public was evenly split in its support for the SR 7/Broward Boulevard Alternative and the Griffin Road Alternative. The same results were seen for the preference between bus and rail.

Exhibit 19: Study Goals and Corresponding Performance Measures

## 6.0 Evaluation of Alternatives

This section of the report identifies the evaluation criteria and measures, provides an overview of the methodology for establishing the measures, and summarizes the results. The evaluation criteria applied to the alternatives are derived from three evaluation frameworks: Study goals and objectives, FTA Section 5309 New Starts Criteria, and NEPA Criteria. Given that specific criteria identified in these evaluation frameworks are in many cases redundant, the recommended evaluation criteria and performance measures are a combination of the criteria that correspond to all three frameworks without being duplicative. Exhibit 16 correlates the Study goals and performance measures. Where possible, the specific measures were matched to those required by the Section 5309 New Starts Criteria, including proposed changes identified in the January 25, 2012, Federal Transit Administration Notice of Proposed Rule Making. Since then, MAP 21 was passed but FTA has not yet issued new guidance regarding Section 5309 New Starts Criteria to implement the provisions of MAP 21. Additional evaluation measures to ensure local interests were addressed were identified through coordination with the TAG and Executive Committee.

All of the criteria and measures used during the analysis are shown in this section of the report, and based upon those study goals and corresponding performance measures shown in Exhibit 19. However, to reach a decision on the LPA, a selection of these measures that either helped to provide a distinction between the alternatives or reflected the key local interests was highlighted. Throughout this section, those LPA criteria are identified by the notation *\*LPA Measure*.

Goals	Performance Measure	LPA Measure
<b>Travel and Mobility: Enhance east-west mobility in central Broward County.</b>	Projected daily boardings in the year 2035	Yes
	Projected annual boardings in the year 2035	Yes
	Number of daily transit dependent boardings in the year 2035	Yes
	Travel times between key destinations or activity centers	Yes
	Change in system-wide Year 2035 Vehicle Miles Traveled compared to No Build	No
<b>Financial and Economic: Most efficiently use available financial resources, and support economic growth and development.</b>	Estimated capital cost	Yes
	Estimated annualized capital cost	No
	Estimated capital cost per mile	Yes
	Estimated capital cost per fixed guideway mile	No
	Estimated annualized capital cost per boarding	Yes
	Estimated annualized capital cost per passenger mile	No
	Estimated annual operating & maintenance cost (not including the background bus network)	Yes
	Estimated annual operating & maintenance cost per boarding	Yes
	Estimated annual operating & maintenance cost per passenger mile	Yes
	Economic development potential based on number of Regional Activity Centers, Local Activity Centers, and Community Redevelopment Areas served	No
	Annualized system-wide fare box recovery	No
	Fare box recovery as a percentage of project annual operating & maintenance costs	No
<b>Community: Be consistent with the needs and desires of the residents of Broward County, in order to maximize community acceptance and support.</b>	Expressed community support for the alternative based on comments during community meetings or official resolutions	No
	Right-of-Way/Acquisition required	Yes
<b>Land Use: Ensure compatibility between land use policies and transit service so that the need for trip-making and the amount of travel is reduced and the opportunities for transit-oriented development are maximized.</b>	Estimated New Starts Overall Land Use Rating	Yes
	2010 number of people within half-mile of potential stations	No
	2035 number of people within half-mile of potential stations	Yes
	2010 number of jobs within half-mile of potential stations	No
	2035 number of jobs within half-mile of potential stations	Yes
	2010 number of students within half-mile of potential stations	No
2035 number of students within half-mile of potential stations	Yes	
<b>Environmental: Enhance and preserve the social and physical environment, and keep potential impacts to sensitive resources to a minimum.</b>	Effects to natural resources based on ETDM Summary Report	Yes



## 6.1 Analysis

### Projected Daily Boardings in the Year 2035 (\*LPA Measure)

Using the Southeast Florida Regional Planning Model (SERPM) v6.7, projected boardings for the year 2035 were developed for each alternative. The detailed approach and results of the travel demand modeling are detailed in *Central Broward East-West Transit Study Microsimulation Alternatives Analysis Technical Memorandum*. Exhibit 20 provides the results for each of the alternatives.

**Exhibit 20: 2035 Projected Daily Boardings**

Alternative	Projected Daily Boardings in 2035
TSM	6,000
SR 7/Broward Boulevard	8,700
Griffin Road Premium Bus	7,900
Griffin Road Modern Streetcar	11,300

### Projected Annual Boardings in the Year 2035 (\*LPA Measure)

Using SERPM v6.7, projected boardings for the year 2035 were developed for each alternative. To determine the number of annual boardings, the daily boardings were multiplied by 300, representing the number of service days anticipated in a calendar year to account for reduced service hours on weekends and holidays. Exhibit 21 provides the results for each of the alternatives.

**Exhibit 21: 2035 Projected Annual Boardings**

Alternative	Projected Annual Boardings in 2035
TSM	1,800,000
SR 7/Broward Boulevard	2,610,000
Griffin Road Premium Bus	2,370,000
Griffin Road Modern Streetcar	3,390,000

### Number of Daily Transit Dependent Boardings in the Year 2035 (\*LPA Measure)

Using SERPM v6.7, projected transit dependent boardings for the year 2035 were determined for each alternative. Exhibit 22 provides these results. These results should not be interpreted to suggest that there are a larger number of transit dependents along the Griffin Road alignment. Instead, what these numbers reflect is the difference in existing and proposed transit services along the SR 7/Broward Boulevard alignment as compared to the Griffin Road alignment. The transit dependent population adjacent to the SR 7/Broward Boulevard alignment currently has, and in the future will, have more transit options available to them than the transit-dependent population adjacent to the Griffin Road alignment, particularly for east-west travel.

**Exhibit 22: 2035 Projected Daily Transit Dependent Boardings**

Alternative	Projected Daily Transit Dependent Boardings in 2035
TSM	Not available
SR 7/Broward Boulevard	1,600
Griffin Road Premium Bus	1,600
Griffin Road Modern Streetcar	2,100

### Travel Times (\*LPA Measure)

This measure reflects a local interest in determining which alternative provides faster service to downtown Fort Lauderdale, the major employment center for Broward County. Given the number of activity centers along the corridor, this information is provided for these activity centers, as well as for connections to regional transit service (Tri-Rail). Exhibit 23 provides this information.

**Exhibit 23: 2035 Estimated Travel Times Between Key Destinations or Activity Centers**

Alternative	Travel Time (in minutes)						
	From Sawgrass To Downtown	From Sawgrass To Airport	From Sawgrass To SFEC	From SFEC To Downtown	From SFEC to Airport	From SFEC to Airport Tri-Rail	From SFEC to Broward Tri-Rail
SR 7/ Broward Boulevard	43	62	18	25	44	48	6
Griffin Road (Premium Bus or Modern Streetcar)	52	37	18	34	19	16	4

### Change in Vehicle Miles Traveled

Another local measure to evaluate which alternative is more successful at reducing congestion, measured through the change in VMT as compared to the No Build Alternative. The data for this measure was provided by SERPM v6.7. Exhibit 24 provides the results.

**Exhibit 24: 2035 Change in System wide VMT Compared to No Build Alternative**

Alternative	2035 No Build Alternative	2035 Build Alternative	Change in VMT
TSM	Not Available	Not Available	Not Available
SR 7/Broward Boulevard	175,830,000	175,803,000	(27,000)
Griffin Road (Premium Bus or Modern Streetcar)	175,830,000	175,806,000	(24,000)

### Estimated Capital Cost (\*LPA Measure)

Capital cost estimates were developed for each alternative and its options, as described in the *Central Broward East-West Transit Study Capital Cost Methodology Technical Memorandum*. The capital costs were developed using the FTA Standard Cost Categories and up-to-date unit costs. Exhibit 25 provides the capital costs for the three alternatives.

**Exhibit 25: Capital Cost Estimates in Year 2010 Dollars**

Alternative	Capital Cost Estimate
TSM	\$40.3 million
SR 7/Broward Boulevard	\$273.9 million
Griffin Road Premium Bus	\$324.7 million
Griffin Road Modern Streetcar	\$466.6 million

### Estimated Annualized Capital Cost (\*LPA Measure)

The capital cost estimates for the Build Alternatives were annualized over a 25 year design life with a seven percent discount rate. The TSM capital cost was annualized over a 20 year design life with a seven percent discount rate. Exhibit 26 provides the annualized capital costs for each of the alternatives.

**Exhibit 26: Annualized Capital Cost Estimates in Year 2010 Dollars**

Alternative	Annualized Capital Cost Estimate
TSM	\$3.8 million
SR 7/Broward Boulevard	\$23.5 million
Griffin Road Premium Bus	\$27.9 million
Griffin Road Modern Streetcar	\$40.0 million

### Estimated Capital Cost per Mile (\*LPA Measure)

Capital cost per mile was calculated for each alternative by dividing the estimated total capital cost by the total mileage of each Build Alternative. Exhibit 27 provides these estimates.

**Exhibit 27: Capital Cost Per Mile in Year 2010 Dollars**

Alternative	Capital Cost Per Mile
TSM	Not Available
SR 7/Broward Boulevard	\$9.5 million
Griffin Road Premium Bus	\$12.8 million
Griffin Road Modern Streetcar	\$18.4 million

### Estimated Capital Cost per Fixed Guideway Mile (\*LPA Measure)

Each of the Build Alternatives includes a fixed guideway portion. At a minimum, it is the modern streetcar portion east of I-95, and at a maximum, it is the extension of the modern streetcar west of I-95 to the SFEC. The total capital costs were divided by the mileage of fixed guideway for each Build Alternative, as shown in Exhibit 28.

**Exhibit 28: Capital Cost Per Fixed Guideway Mile in Year 2010 Dollars**

Alternative	Capital Cost per Fixed Guideway Mile
TSM	Not Available
SR 7/Broward Boulevard	\$42.8 million
Griffin Road Premium Bus	\$23.7 million
Griffin Road Modern Streetcar	\$34.1 million



**Estimated Annualized Capital Cost per Boarding** (\*LPA Measure)

Capital cost per boarding was calculated by dividing the annualized capital cost by the annualized boardings for each alternative. Exhibit 29 provides the results.

**Exhibit 29: Capital Cost Per Boarding in Year 2010 Dollars**

Alternative	Capital Cost per Boarding
TSM	\$2.10
SR 7/Broward Boulevard	\$9.00
Griffin Road Premium Bus	\$11.75
Griffin Road Modern Streetcar	\$11.80

**Estimated Annualized Capital Cost per Passenger Mile** (\*LPA Measure)

The total number of passenger miles for each alternative was provided by SERPM v6.7. The total daily passenger miles were annualized by multiplying them by 300. The annualized capital costs were then divided by the annualized passenger miles. Exhibit 30 provides these results.

**Exhibit 30: Capital Cost Per Passenger Mile in Year 2010 Dollars**

Alternative	Capital Cost per Passenger Mile
TSM	\$3.65
SR 7/Broward Boulevard	\$2.55
Griffin Road Premium Bus	\$2.60
Griffin Road Modern Streetcar	\$2.20

**Estimated Annual Operating & Maintenance Cost** (\*LPA Measure)

Annual operating and maintenance costs were developed for each alternative based on the operating plan developed. The operating plans established the number of revenue hours per day, which were multiplied by an established unit cost based on the vehicle. For bus operations, the BCT 2010 cost per revenue hour from the National Transit Database was utilized. To account for the additional infrastructure (real time passenger information, transit signal priority, and stop amenities), the bus operating cost per revenue hour was increased by ten percent. For modern streetcar, the midpoint between the low and high O&M costs for other comparable streetcar systems was used. For the low cost estimate, the cost per revenue hour used by the Wave project in 2008 was utilized. For the high cost estimate, the cost per revenue hour for the Seattle, Washington streetcar<sup>6</sup> was used. Exhibit 31 provides the results.

<sup>6</sup> National Transit Database, 2010.

**Exhibit 31: Annual Operating & Maintenance Cost in Year 2010 Dollars**

Alternative	O & M Cost
TSM	\$6.6 million
SR 7/Broward Boulevard	\$6.7 million
Griffin Road Premium Bus	\$6.6 million
Griffin Road Modern Streetcar	\$7.6 million

**Estimated Annual Operating & Maintenance Cost per Boarding** (\*LPA Measure)

To calculate this figure, the annual operating and maintenance cost for each alternative was divided by the annualized boardings. Exhibit 32 provides the results.

**Exhibit 32: Annual Operating & Maintenance Cost per Boarding in Year 2010 Dollars**

Alternative	O & M Cost per Boarding
TSM	\$3.65
SR 7/Broward Boulevard	\$2.55
Griffin Road Premium Bus	\$2.80
Griffin Road Modern Streetcar	\$2.25

**Estimated Annual Operating & Maintenance Cost per Passenger Mile** (\*LPA Measure)

The annual operating and maintenance cost was divided by the annualized passenger miles for each alternative to calculate this figure. Exhibit 33 provides the results.

**Exhibit 33: Annual Operating & Maintenance Cost per Passenger Mile in Year 2010 Dollars**

Alternative	O & M Cost per Passenger Mile
TSM	Not Available
SR 7/Broward Boulevard	\$1.70
Griffin Road Premium Bus	\$1.60
Griffin Road Modern Streetcar	\$2.40

### Expressed Community Support for the Alternative

This was measured as “yes” or “no” and was based on the comments made during community meetings, presentations to elected officials, and adopted resolutions. For the SR 7/Broward Boulevard Alternative, there were no official resolutions passed, but the residents along the corridor expressed support for the alignment, especially as premium bus, during several homeowner association meetings and public workshops for the Study. For the Griffin Road Alternatives, the City of Dania Beach passed a resolution on April 10, 2012, and a majority of the Town of Davie Council Members expressed their support during one-on-one meetings over the course of the Study. Therefore, for each alternative, the rating was “yes”.

### Right-of-Way/Acquisition Required (\*LPA Measure)

Exact measurements of right-of-way necessary for the Build Alternatives could not be determined at this level of design. However, based on the conceptual design, it became apparent that only slivers of right-of-way at intersections may be necessary to accommodate the modern streetcar vehicle. Since each Build Alternative includes some segments operated with modern streetcar, the rating for each alternative was “minimal”. There were no entire parcels or large portions of parcel identified as being necessary to accommodate the Build Alternatives.

### Estimated New Starts Overall Land Use Rating (\*LPA Measure)

Using the FTA criteria for determining the land use rating for projects, an estimate of how each alternative would rate was developed. This measure was the compilation of several factors including:

1. The number of people within half-mile of station areas for both year 2010 and year 2035;
2. The number of jobs within half-mile of station areas for both year 2010 and 2035;
3. The typical daily parking cost in downtown Fort Lauderdale;
4. The existing number of parking spaces per employee in downtown Fort Lauderdale;
5. Parking policy in downtown Fort Lauderdale in terms of the number of spaces required per square foot;
6. Parking policy in other areas in terms of number of spaces required per square foot;
7. Floor area ratios for downtown Fort Lauderdale and other commercial areas;
8. Pedestrian access, based on the availability of sidewalks;
9. Growth management policies;
10. Transit supportive corridor policies;
11. Supportive zoning regulations near transit stations;
12. Tools to implement land use policies;
13. Performance of land use policies; and
14. Potential impact of transit project on regional land use.

All of the alternatives rated equally for most of the criteria with the only exception being the potential effect of the CBT project on regional land use. The parcels adjacent to the SR 7/Broward Boulevard Alignment tend to be smaller in size when compared to the parcels adjacent to the Griffin Road alignment; therefore, the potential for redevelopment (based solely on available land area) is reduced. Further, as noted in the Land Use section of this document, there is more land designated for mixed-use along the Griffin Road alignment, and therefore, greater potential exists for future development that could be transit-supportive. The real estate market conditions are also different for the two alignments, although both are generally depressed at this time as a result of the current economic conditions. However, prior to the downturn, there was more development and investment occurring along the Griffin Road alignment than was witnessed along the SR 7/Broward Boulevard Alignment. Exhibit 34 provides the results of this evaluation.

Exhibit 34: Estimated New Starts Overall Land Use Rating

Alternative	New Starts Overall Land Use Rating
TSM	Not Available
SR 7/Broward Boulevard	Medium Low
Griffin Road Premium Bus	Medium
Griffin Road Modern Streetcar	Medium

### Existing (2010) Population within Half-Mile of Stations

Using data from the 2010 US Census, the number of people within half-mile of proposed station areas was determined. Exhibit 35 provides these results.

Exhibit 35: 2010 Population within Half-Mile of Proposed Stations

Alternative	2010 Population within Half-Mile of Proposed Stations
TSM	n/a
SR 7/Broward Boulevard	40,000
Griffin Road Premium Bus	39,500
Griffin Road Modern Streetcar	39,500

### Projected 2035 Population within Half-Mile of Stations (\*LPA Measure)

Using data from SERPM v6.5, the projected number of people within half-mile of proposed stations in the year 2035 was determined, as shown in Exhibit 36.

Exhibit 36: 2035 Projected Population within Half-Mile of Proposed Stations

Alternative	2035 People within Half-Mile of Proposed Stations
TSM	n/a
SR 7/Broward Boulevard	75,400
Griffin Road Premium Bus	73,900
Griffin Road Modern Streetcar	73,900



**Existing (2010) Jobs within Half-Mile of Stations**

Using data from SERPM v6.5 that was updated with 2010 US Census data, the number of jobs within half-mile of proposed stations in the year 2010 was determined, as shown in Exhibit 37.

**Exhibit 37: 2010 Existing Jobs within Half-Mile of Proposed Stations**

Alternative	2010 Jobs within Half-Mile of Proposed Stations
TSM	n/a
SR 7/Broward Boulevard	36,000
Griffin Road Premium Bus	49,000
Griffin Road Modern Streetcar	49,000

**Projected 2035 Jobs within Half-Mile of Stations (\*LPA Measure)**

Using data from SERPM v6.5, the projected number of jobs within half-mile of proposed stations in the year 2035 was determined, as shown in Exhibit 38.

**Exhibit 38: 2035 Projected Jobs within Half-Mile of Proposed Stations**

Alternative	2035 Jobs within Half-Mile of Proposed Stations
TSM	n/a
SR 7/Broward Boulevard	72,700
Griffin Road Premium Bus	87,900
Griffin Road Modern Streetcar	87,900

**Existing (2010) Students within Half-Mile of Stations**

Using data from SERPM v6.5, the number of students enrolled in higher education institutions<sup>7</sup> within half-mile of proposed station areas was determined. This measure was added by the Executive Committee based on the importance of the SFEC to the alternatives. Exhibit 39 provides the results.

**Exhibit 39: 2010 Existing Students within Half-Mile of Proposed Stations**

Alternative	2010 Students within Half-Mile of Proposed Stations
TSM	n/a
SR 7/Broward Boulevard	21,500
Griffin Road Premium Bus	38,500
Griffin Road Modern Streetcar	38,500

**Projected 2035 Students within Half-Mile of Stations (\*LPA Measure)**

Using data from SERPM v6.5, the projected number of students enrolled in higher education institutions<sup>7</sup> within half-mile of proposed station in the year 2035 areas was determined. This measure was added by the Executive Committee based on the importance of the SFEC to the alternatives. Exhibit 40 provides the results.

**Exhibit 40: 2035 Projected Students within Half-Mile of Proposed Stations**

Alternative	2035 Students within Half-Mile of Proposed Stations
TSM	n/a
SR 7/Broward Boulevard	29,000
Griffin Road Premium Bus	54,500
Griffin Road Modern Streetcar	54,500

**Potential for Impacts to Natural Resources (\*LPA Measure)**

This measure is a compilation of the environmental screening data presented in the previous section and the ETDM Summary Report. Exhibit 41 provides the results.

**Exhibit 41: Potential for Impacts to Natural Resources**

Alternative	Potential for Impacts to Natural Resources
TSM	None
SR 7/Broward Boulevard	Minimal
Griffin Road Premium Bus	Minimal
Griffin Road Modern Streetcar	Minimal

<sup>7</sup> Enrollment numbers represent where students are enrolled, as opposed to where they live, and are aggregated by Traffic Analysis Zones (TAZs).

## 6.2 Conclusions

Exhibit 42 provides the results of the evaluation in a single table for comparative purposes. When the alternatives are considered in a side-by-side evaluation, the greatest differences are seen in the following performance measures.

1. **Projected Boardings:** The Griffin Road Modern Streetcar Alternative has the highest number of projected boardings (daily and annual), whereas the SR 7/Broward Boulevard Alternative and Griffin Road Premium Bus Alternative have similar projections.
2. **Capital Costs:** The SR 7/Broward Boulevard Alternative is the less expensive of the Build Alternatives.
3. **Operating & Maintenance Costs:** Both the SR 7/Broward Boulevard and Griffin Road Premium Bus Alternatives have similar projected operating costs, while the Griffin Road Modern Streetcar Alternative is projected to cost \$1 million more than the bus alternatives. However, when considering the operating and maintenance cost per boarding, the Griffin Road Modern Streetcar Alternative shows better efficiency.
4. **Number of Jobs:** The Griffin Road alignment has the potential of providing access to a larger number of jobs based on its routing around the SFEC and the ability to provide more stations in this area as compared to the SR 7/Broward Alternative, as well as its proximity to the employment area located adjacent to Florida’s Turnpike, north of Griffin Road.
5. **Number of Students:** The Griffin Road alignments also offer better access to educational opportunities because of its routing around the SFEC.

Given that the evaluation results were so similar for the Build Alternatives, the LPA decision was based on the following factors: projected boardings, projected number of jobs and students near potential stations, and operating and maintenance cost per boarding. While the SR 7/Broward Boulevard Alternative provides a more cost-effective solution, it does not offer the same potential for economic development that has been shown to follow investments in fixed guideway transit. The community leaders decided that this potential for economic development is worth the additional financial investment associated with the Griffin Road Modern Streetcar Alternative. It was also decided that an investment in modern streetcar would attract more choice riders and make Broward County more competitive in the national market.

Exhibit 42: Evaluation of Alternatives Summary Table

PERFORMANCE MEASURE	TSM	SR 7/ Broward Blvd	Griffin Road	
			Majority Premium Bus	Majority Streetcar
Number of Daily Transit Boardings (Year 2035)	6,000	8,700	7,900	11,300
Projected Annual Transit Boardings (Year 2035)	1,800,000	2,610,000	2,370,000	3,390,000
Number of Daily Transit Dependent Boardings	n/a	1,600	1,617	2,100
Travel times				
<i>Sawgrass to Downtown</i>	n/a	43 minutes	52 minutes	
<i>Sawgrass to Airport</i>	n/a	62 minutes	37 minutes	
<i>Sawgrass to SFEC</i>	n/a	18 minutes	18 minutes	
<i>SFEC to Downtown</i>	n/a	25 minutes	34 minutes	
<i>SFEC to Airport</i>	n/a	44 minutes	19 minutes	
<i>SFEC to Griffin Road Tri-Rail</i>	n/a	48 minutes	16 minutes	
<i>Downtown to Broward Tri-Rail</i>	n/a	6 minutes	4 minutes	
Change in Systemwide VMT from No Build	0	(27,340)	(26,530)	
Estimated Capital Cost (millions)	\$40.3 M	\$273.9 M	\$324.7 M	\$466.6 M
Annualized Capital Cost (millions)	\$3.8 M	\$23.5 M	\$27.9 M	\$40.0 M
Estimated Capital Cost per Mile (millions)	n/a	\$9.5 M	\$12.8 M	\$18.4 M
Estimated Capital Cost per Fixed Guideway Mile (millions)	\$0.00	\$42.8 M	\$23.7 M	\$34.1 M
Estimated Annualized Capital Cost per Boarding	\$2.10	\$9.00	\$11.75	\$11.80
Estimated Annualized Capital Cost per Passenger Mile	n/a	\$2.05	\$2.60	\$2.20
Estimated Annual O&M Cost (millions)	\$6.6 M	\$6.7 M	\$6.6 M	\$7.6 M
Estimated O&M Cost per Boarding	\$3.65	\$2.55	\$2.80	\$2.25
Estimated O&M Cost per Passenger Mile	n/a	\$1.70	\$1.60	\$2.40
Community Support	n/a	Yes	Yes	
Right-of-Way/Acquisition Required	None	Minimal	Minimal	
Estimated New Starts Overall Land Use Rating	n/a	Medium Low	Medium	
2010 number of people within half-mile of potential stations	n/a	40,000	39,500	
2035 number of people within half-mile of potential stations (includes Wave stations)	n/a	75,400	73,900	
2010 number of jobs within half-mile of potential stations	n/a	36,000	49,000	
2035 number of jobs within half-mile of potential stations (includes Wave stations)	n/a	72,700	87,900	
2010 number of students within half-mile of potential stations	n/a	21,500	38,500	
2035 number of students within half-mile of potential stations (includes Wave stations)	n/a	29,000	55,000	
Potential Impacts to Natural Resources	None	Minimal	Minimal	



## 7.0 LPA Selection

Following the public meetings in early April 2012, the Study team made presentations about the evaluation and public meeting results to the Broward MPO Board and its committees. The Technical Coordination Committee and Community Involvement Roundtable took action on the study during their May meetings. Both of the committees recommended to the Broward MPO Board that the Griffin Road Modern Streetcar Alternative be selected as the LPA. Presentations to the Broward MPO Board were made in May, July, and October. At the October 11, 2012 meeting, the Broward MPO adopted the Griffin Road Modern Streetcar Alternative, as shown in Exhibit 43, as the LPA for the Study. As shown in Exhibit 44, this decision was based on the higher number of projected boardings, larger numbers of jobs and students near potential stations, and the lower operating and maintenance cost per boarding. The MPO Board and its committees also stated that there is a greater potential for economic development and ability to attract choice riders with the modern streetcar technology.

Exhibit 43: Locally Preferred Alternative

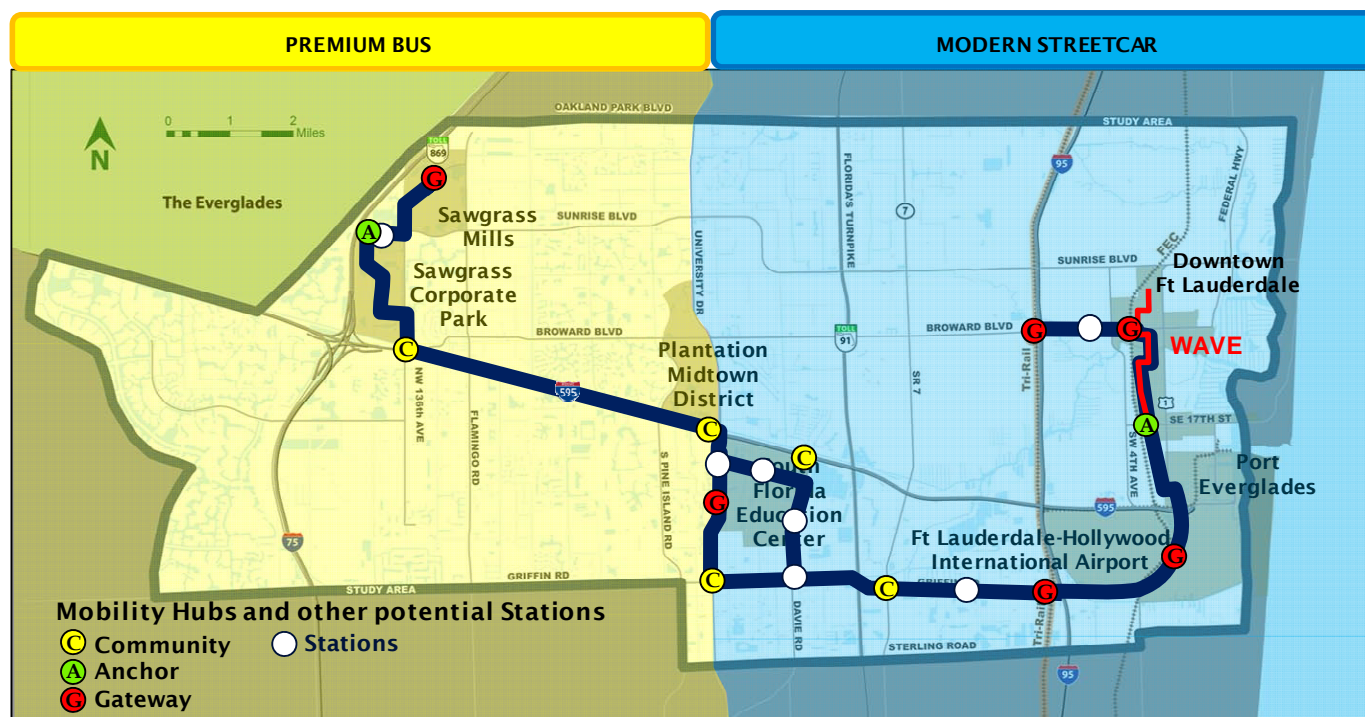


Exhibit 44: Decision Matrix

Performance Measure	TSM	SR 7/ Broward Boulevard	Griffin Road Premium Bus	Modern Streetcar
2035 Daily Transit Boardings	6,000	8,700	7,900	11,300
2035 Annual Transit Boardings	1,800,000	2,610,000	2,370,000	3,390,000
Estimated Capital Costs	\$40.3 M	\$273.9 M	\$324.7 M	\$466.6 M
Annual O&M Costs	\$6.6 M	\$6.7 M	\$6.6 M	\$7.6 M
O&M Cost per Boarding	\$3.65	\$2.55	\$2.80	\$2.25
Community Support	N/A	Yes	Yes	Yes
Potential Impacts to Natural Resources	None	Minimal	Minimal	Minimal
Estimated New Starts Overall Land Use Rating	N/A	Medium Low	Medium	Medium
Potential Traffic Impacts	N/A	AM peak travel time savings	AM (both directions) & PM (eastbound only) peak travel time savings	AM (both directions) & PM (eastbound only) peak travel time savings
2010 Population Near Stations	N/A	40,000	39,500	39,500
2035 Population Near Stations	N/A	75,400	73,900	73,900
2010 Jobs Near Stations	N/A	36,000	49,000	49,000
2035 Jobs Near Stations	N/A	72,700	87,900	87,900
2010 Students Near Stations	N/A	21,500	38,500	38,500
2035 Students Near Stations	N/A	29,000	55,000	55,000

Key: Cells with orange shading indicate the alternative that ranked higher for that performance measure.





## Appendix A – Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING  
Between  
BROWARD METROPOLITAN PLANNING ORGANIZATION,  
BROWARD COUNTY TRANSIT,  
SOUTH FLORIDA REGIONAL TRANSPORTATION AUTHORITY  
And  
FLORIDA DEPARTMENT OF TRANSPORTATION, DISTRICT 4

This Memorandum of Understanding (“MOU”) is entered into between the Broward Metropolitan Planning Organization (“MPO”), Broward County Transit (“BCT”), the South Florida Regional Transportation Authority (“SFRTA”), and the Florida Department of Transportation, District 4 (“FDOT”), collectively “Parties”.

The Parties wish to continue the efforts already underway to improve mobility in the region which have involved unprecedented state, regional and local stakeholder collaboration and coordination, including the Parties’ ongoing efforts to identify optimum multimodal alternatives for a balanced transportation system and to support local and regional land use plans.

The development of a multimodal transportation system within the region involves a number of transportation agencies and is a complex undertaking. Each of the Parties has unique skills and abilities which are necessary for successful completion of an environmental document, with the Federal Transit Administration (“FTA”) as the Lead Agency, for proposed premium transit service generally described as the Central Broward East-West Transit Study (the “Project”).

The Project is defined as an environmental analysis of the impacts and benefits that would result from the provision of a premium transit service in the defined study area. The limits of this study area are Oakland Park Boulevard to the north, Griffin Road from Bonaventure Boulevard to Pine Island Road and Stirling Road from Pine Island Road to the Intracoastal Waterway to the south, the Intracoastal Waterway to the east, and the Weston/Sawgrass area to the west. Federal funding has been secured for the Project to complete the environmental, or National Environmental Protection Act (NEPA), phase. The Project is consistent with the MPO’s 2035 Long Range Transportation Plan (“LRTP”) and is included in the plan under the Illustrative Project section. The LRTP shall serve as the basis for the project and all previous technical work and analysis completed to date shall be used as the foundation for the study.

Upon completion of this work the Parties will determine the how to proceed into the next phases of the project development process and may reconsider Project Roles at that time. The Parties will collaborate on a schedule for proceeding, as well as agree on a funding plan for the next phase of the project, including Engineering and Design.

The purpose of this MOU is to develop a multi-agency partnership for undertaking the Project. This includes, but is not limited to: technical studies and evaluations, including the definition of a premium transit service and subsequent environmental review within the defined Project study area and any funding and administration relating to the Project.

NOW, THEREFORE, the Parties hereby mutually agree and express their understanding that:

1. **Project Roles**—The role of the Parties in conducting the Project shall be as follows:
  - a. All Parties shall insure that the Project is coordinated and consistent with all local, regional, and state transportation plans.
  - b. Each partner shall seek to reach consensus on key project issues.
  - c. SFRTA and BCT will coordinate with FDOT on the operations planning for the alternatives, particularly as it affects their services, as well as coordination with the FTA.
  - d. The MPO will assist in coordinating public outreach events and be the liaison for the municipalities.
  - e. FDOT shall serve as contract manager for the Project and shall administer Project funds, insure that the Project’s procurement process is consistent with federal, state and local regulations and that appropriate billing procedures are implemented. {It is noted that the transfer of any funds shall be by separate agreement(s).} Other agencies shall have an advisory role in decisions made regarding Project content.
2. **Party Involvement in the Project**—The Project shall be conducted with the involvement of, and in cooperation with, each Party at each stage of the Project. Approval from each Party must be obtained at each project milestone and approved upon completion of each Project milestone. The major milestones for the purposes of the MOU include:
  - a. **MPO Board Meeting Presentations**
  - b. **Final Corridor Definition**
  - c. **FTA Meetings**
  - d. **Submission of a draft environmental document to the FTA**
  - e. **Distribution of a draft environmental document to the Public**
  - f. **Public Hearing on the draft environmental document**
  - g. **Funding Source and Schedule for Next Phase of the Project Development Process**
3. **Project Executive Committee**—The Parties shall establish a Project Executive Committee to provide guidance for the Project and to serve as a liaison to their respective agencies. The MPO, BCT, SFRTA and FDOT shall select up to two senior level representatives to serve as members of the Committee, and all Parties shall participate fully in this committee, including providing staff and technical support to the committee as deemed necessary. The Project Executive Committee will meet quarterly or as necessary to discuss Project status, issues facing the Project and to develop strategies for resolving Project-related challenges.
4. Through this MOU, the Parties express their mutual intent to move in a diligent and thorough manner to develop the Project environmental document, but understand that this MOU is, by its nature, an understanding outlining commitments to be made in this process and imposes no legally enforceable contractual obligations on any Party.
5. This MOU shall take effect when approved by all Parties on the last date shown below, and shall expire upon completion of the environmental document or upon sixty (60) days

notice of termination by any Party. The Understanding may be extended in writing by the Parties.

APPROVED AND ADOPTED by each Party on the date shown below:

**BROWARD METROPOLITAN PLANNING ORGANIZATION**

BY:  \_\_\_\_\_

DATE: 10/31/11 \_\_\_\_\_

**BROWARD COUNTY TRANSIT**

BY:  \_\_\_\_\_

DATE: 10/31/11 \_\_\_\_\_

**SOUTH FLORIDA REGIONAL TRANSPORTATION AUTHORITY**

BY:  \_\_\_\_\_

DATE: 10/28/11 \_\_\_\_\_

**FLORIDA DEPARTMENT OF TRANSPORTATION, DISTRICT 4**

BY:  \_\_\_\_\_

DATE: 10/27/11 \_\_\_\_\_





## Appendix B – Public Outreach and Agency Coordination Meetings List

Technical Advisory Group	
Meeting Dates (since June 2010)	Meeting Topics
April 6, 2011	Project update, including new approach adopted by the MPO, and travel demand forecasting overview
November 16, 2011	Update on project alternatives and options
April 4, 2012	Environmental screening and alternatives analysis results

Homeowner Association/Civic Group	Date(s) of Meeting(s)
Boulevard Gardens Community Group	March 19, 2012
Broadview Park Civic Association	October 4, 2011 April 3, 2012
Broward Estates	March 27, 2012
City View Townhomes	May 9, 2012
Croissant Park Civic Association	May 29, 2012
Dorsey-Riverbend Homeowners Association	November 28, 2011
Everglades Lakes Homeowners Association	May 1, 2012
Friends of Franklin Park	September 19, 2011 March 19, 2012
Griffin Civic Association	June 5, 2012
Lauderdale Isles Civic Improvement Association	May 17, 2012
Lazy Land Mobile Home Park	May 30, 2012
Melrose Manors	September 26, 2011 March 26, 2012
Melrose Park	March 22, 2012
Plantation Country Club Estates	September 13, 2011 February 28, 2012
Plantation Park East	March 20, 2012
Progresso Village Civic Association	April 16, 2012
Riverside Park Residents Association	May 2, 2012
Roosevelt Gardens	September 19, 2011 April 16, 2012
Sawgrass Preserve	February 16, 2012
Tarpon River Civic Association	May 24, 2012
Washington Park Civic Association	March 8, 2012
West Ken Lark	September 14, 2011 March 14, 2012

Agency Coordination	Meeting Date	Topic
Nova Southeastern University	November 2, 2010	Review of alignment options near the university
Broward MPO Staff	December 8 & 17, 2010	New alternatives and public outreach approach
City of Fort Lauderdale	December 7, 2011	Proposed greenway along 4th Avenue and Perimeter Road
Town of Davie Staff	December 16, 2010	Review of alignment options within the Town of Davie
Broward County Transit	November 23, 2010 December 16, 2010	New approach Overview of study for new transit director
South Florida Regional Transportation Authority, Planning Technical Advisory Committee	December 15, 2010	Overview of study and new alternatives
Downtown Development Authority	November 5, 2010	New alternatives
Broward College	January 10, 2011	New alternatives
South Florida Education Center Transportation Management Association	January 12, 2011 May 11, 2011 January 11, 2012	New alternatives Study update Study update
City of Sunrise Staff	March 17, 2011	New alternatives
Downtown Fort Lauderdale Transit Working Group	April 12, 2011 August 29, 2011	Coordination among various transit projects occurring in downtown Fort Lauderdale



Elected Official or Group	Meeting Date and Purpose
<b>Commissioner Richard Blattner, City of Hollywood</b>	January 25 and November 21, 2011 – In advance of MPO Board meeting
<b>Commissioner Charlotte Rodstrom, City of Fort Lauderdale</b>	January 26 and November 14, 2011 – In advance of MPO Board meeting
<b>Councilmember Bryan Caletka, Town of Davie</b>	January 26, 2011 – In advance of MPO Board meeting February 6, 2012 - To review alignment options being considered within the Town of Davie
<b>Mayor Rae Carole Armstrong, City of Plantation</b>	February 2, 2011 - In advance of MPO Board meeting
<b>Commissioner Dale Holness, Broward County</b>	February 3 and November 14, 2011 - In advance of MPO Board meeting August 10 and 12, 2011 - Meetings with his constituents regarding their transit needs
<b>Commissioner Kristin Jacobs, Broward County</b>	February 3, 2011 - In advance of MPO Board meeting
<b>Commissioner Lois Wexler, Broward County</b>	February 3, 2011 - In advance of MPO Board meeting
<b>Commissioner Barbara Sharief, Broward County</b>	February 3, 2011 - In advance of MPO Board meeting
<b>Commissioner Bruce Roberts, City of Fort Lauderdale</b>	February 3 and November 21, 2011 - In advance of MPO Board meeting
<b>Town of Davie Council Workshop</b>	May 4, 2011 – To provide an update on the study’s progress
<b>Mayor Richard Kaplan, City of Lauderhill</b>	November 14, 2011 – In advance of MPO Board meeting
<b>City of Fort Lauderdale Commission Workshop</b>	February 7, 2012 – To provide an update on the study’s progress
<b>Mayor Judy Paul, Town of Davie</b>	February 6, 2012 - To review alignment options being considered within the Town of Davie
<b>Councilmember Caryl Hattan, Town of Davie</b>	February 6, 2012 - To review alignment options being considered within the Town of Davie
<b>Vice Mayor Marlon Luis, Town of Davie</b>	February 8, 2012 - To review alignment options being considered within the Town of Davie
<b>Councilmember Susan Starkey, Town of Davie</b>	February 9, 2012 - To review alignment options being considered within the Town of Davie
<b>City of Sunrise City Commission</b>	July 10, 2012 – To review alternatives prior to MPO consideration of LPA
<b>Broward MPO TCC</b>	September 27, 2010 – New approach January 24, 2011 – Study progress November 28, 2011 – Study update April 23, 2012 – Review of analysis results in preparation for recommending an LPA May 21, 2012 – Recommendation of an LPA
<b>Broward MPO CIR</b>	January 25, 2011 – New approach November 29, 2011 – Study update April 24, 2012 – Review of analysis results in preparation for recommending an LPA May 22, 2012 – Recommendation of an LPA

Elected Official or Group	Meeting Date and Purpose
<b>Broward MPO Board</b>	October 14, 2010 – New approach February 10, 2011 – Study update December 8, 2011 – Study update May 10, 2012 – Review of analysis results in preparation for recommending an LPA July 12, 2012 – Discussion item that was moved to an action item and then deferred to September 20, 2012