ADMINISTRATIVE ACTION

TIER 1 DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Submitted Pursuant to 42 U.S.C. 4332 (2)(c)
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Cooperating Agencies

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South Florida East Coast Corridor Transit Analysis
Miami-Dade, Broward, and Palm Beach Counties, Florida

9/22/06
Date of Approval

Jim Wolfe, P.E., District Secretary
Florida Department of Transportation

9/21/06
Date of Approval

Yvette G. Taylor, Regional Administrator
Federal Transit Administration

Abstract: This Tier 1 Draft Programmatic Environmental Impact Statement (DPEIS) identifies the current and future need to address congestion issues and to support economic as well as land development policies in the eastern area of the Tri-County region comprised of Miami-Dade, Broward, and Palm Beach Counties in southeast Florida. The project study follows a generally two-mile wide study area centered on the existing Florida East Coast (FEC) Railway along approximately 85 miles between Downtown Miami in Miami-Dade County to just north of the Village of Tequesta in Palm Beach County. The project consists of a planning, engineering, and environmental study, its documentation, and includes Transit Feasibility and Alternatives Analysis. The concepts evaluated include the No-Build, Transportation Systems Management (TSM) and a range of Build alternatives. Build alternatives are comprised of alignment and transit technology combinations, based on travel market segments serviced, along FEC Railway right-of-way or nearby roadways, waterways or utility rights-of-way parallel to it and to the Atlantic Coastline. For the Build alternatives, various rail, bus, and other technologies were considered both for existing transit and freight railway as well as for other corridors. Potential impacts of the alternatives on the natural and human environment were also assessed. Upon completion of the Tier 1 study, decisions will be made regarding the alternatives on rail or roadway facilities; what projects should be studied individually in Tier 2 segments; and priority alignments for Tier 2 studies.

The following persons may be contacted for additional information concerning this document:

Scott P. Seeburger
SFECCTA Project Manager
Florida Department of Transportation
District IV Planning and Environmental Management
3400 West Commercial Boulevard
Fort Lauderdale, FL 33309-3421
E-mail: scott.seeburger@dot.state.fl.us
Phone: (954) 777-4632

Tony Dittmeier
Transportation Program Specialist
Federal Transit Administration
Region 4 (TRO-4)
Atlanta Federal Center, Suite 17T50
61 Forsyth St., S.W.
Atlanta, GA 30303
E-mail: Tony.Dittmeier@fta.dot.gov
Phone: (404) 562-3512

A 45-day period has been established for comments on this Tier 1 Draft Programmatic Environmental Impact Statement. Comments should be sent to Scott Seeburger at the address above or submitted by using the online comment form at www.sfeccstudy.com by December 8 2006 or 25 days after the last public hearing, whichever is later.

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Separate Volumes Available Upon Request

Advance Notification and Agency Response Summary Technical Memorandum
Cultural Resources Reconnaissance Study
Environmental Data Reports, Inc. [EDR] Contamination Search for SFECCTA Study Area
Project Scoping Summary Technical Memorandum
Summary of Prior Studies Report

Existing Conditions Report

Existing Travel Characteristics Technical Memorandum

Travel Demand Model Methodology & Results Report

Tiered Programmatic EIS Methodology Technical Memorandum

Precedent Report on Transit-Oriented Development (TOD)

Station Suitability Analysis Report

Existing Conditions SFRC (CSXT)

Existing Conditions FEC

Freight Integration Analysis Report

North End Connections Technical Memorandum

Existing Bridge Structures Technical Memorandum

Alternative Modal Technologies Technical Memorandum

Alternatives Development Technical Memorandum

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Abbreviations and Acronyms

AGT	Automated Guideway Transit
AN	Advance Notification
BCT	Broward County Transit
BRT	Bus Rapid Transit
CBD	Central Business District
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH	Critical Habitat
CRA	Community Redevelopment Agency/Community Redevelopment Area
CSXT	CSX Transportation
DCA	Florida Department of Community Affairs
DDA	Downtown Development Authority
DERM	Miami-Dade County Department of Environmental Resources Management
DMU	Diesel Multiple Unit
DPEIS	Draft Programmatic Environmental Impact Statement
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ERP	Environmental Resource Permit
ESA	Endangered Species Act
ESBA	Endangered Species Biological Assessment
EST	Environmental Screening Tool
ETDM	Efficient Transportation Decision Making
FAC	Florida Administrative Code
FDA	Florida Department of Agriculture & Consumer Services
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEC	Florida East Coast
FEMA	Federal Emergency Management Agency
FGDL	Florida Geographic Data Library
FLL	Ft. Lauderdale/Hollywood International Airport
FHWA	Federal Highway Administration
FMSF	Florida Master Site File

FNAI	Florida Natural Areas Inventory
FRA	Federal Railroad Administration
FS	Florida Statutes
FTA	Federal Transit Administration
FWC	Florida Fish and Wildlife Conservation Commission
GIS	Geographic Information System
HAPC	Habitat Areas of Particular Concern
HOV	High Occupancy Vehicle
HSF	High Speed Ferry
HSR	High Speed Rail
ICR	Intergovernmental Coordination and Review
ICWW	Intracoastal Waterway
IPR	Intercity Passenger Rail
LOS	Level of Service
LRT	Light Rail Transit
LRTP	Long Range Transportation Plan
LPA	Locally Preferred Alternative
MDT	Miami-Dade Transit
MIA	Miami International Airport
MIC	Miami Intermodal Center
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service (NOAA Fisheries)
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priority List (“Superfund”)
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OFW	Outstanding Florida Waters
O&M	Operations and Maintenance
Palm Tran	Palm Beach County’s Public Transportation System

PBIA	Palm Beach International Airport
PD&E	Project Development and Environment
PEIS	Programmatic Environmental Impact Statement
PEV	Port Everglades
PIP	Public Involvement Program
PLEMO	Planning and Environmental Management Office (Florida District Six Office)
PL&EM	Planning & Environmental Management, Office of (Florida District Four)
POM	Port of Miami-Dade, Dante B. Fascell
PPB	Port of Palm Beach
ROD	Record of Decision
RGB	Regional Bus
RGR	Regional Rail
RRT	Rapid Rail Transit
RTR	Rubber-Tired Rapid Transit
SAFETEA-LU	Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users
SFECC	South Florida East Coast Corridor
SFECCTA	South Florida East Coast Corridor Transit Analysis
SFRC	South Florida Rail Corridor
SFRPC	South Florida Regional Planning Council
SFRTA	South Florida Regional Transportation Authority
SFWMD	South Florida Water Management District
SIS	Strategic Intermodal System
TEA-21	Transportation Equity Act for the 21st Century
TOD	Transit-Oriented Development
TSC	Technical Steering Committee
TSM	Transportation Systems Management
UDB	Urban Development Boundary
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
WER	Wetland Evaluation Report

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0.1. Background

This document is a Tier 1 Draft Programmatic Environmental Impact Statement (DPEIS) for the South Florida East Coast Corridor Transit Analysis (SFECCTA) study. In Tier 1, the broad regional issues and alternatives are considered and evaluated. This document highlights the environmental review processes in accordance with Federal Transit Administration (FTA), Federal Highway Administration (FHWA), and Florida Department of Transportation (FDOT) guidelines. In addition, the DPEIS documents the information necessary to ultimately reach a Record of Decision (ROD) for Tier 1 and subsequently allow the study to proceed to Tier 2. In Tier 2, individual segmental studies of alternatives developed during Tier 1 will be further analyzed. In addition, Locally Preferred Alternatives (LPAs) will be identified for each segment which are then submitted to FTA for federal assistance in the form of "New Starts" funding as authorized under the provisions of the new public transportation statute, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act--A Legacy for Users (SAFETEA-LU).

Figure 0.1: Study Area Location Map

The Tier 1 DPEIS evaluates the range of transit alternatives available given the location and nature of the region under study, including a planning level estimate of impacts that are required to be assessed under the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.). Separate NEPA

documents will be prepared in Tier 2 for each independent project segment, consistent with the conclusions and ROD established in the Tier 1 DPEIS. Tiering allows the public to participate in a more informed and conversational role while balancing a complex set of issues and possible actions, thereby making a more effective contribution to the NEPA process. Tiering also establishes concurrence on the broader regional issues which can save time during the Tier 2 studies.

The SFECCTA study area is centered along the Florida East Coast (FEC) Railway corridor, bounded on the south by the Central Business District (CBD) of the City of Miami with potential connections west to the Miami Intermodal Center (MIC) located adjacent to the City of Hialeah, and on the north by the City of Tequesta in Palm Beach County. A Study Area Location Map is included above (**Figure 0.1**). Information on the study is also available on the project website at www.sfeccstudy.com. The segment of the FEC corridor under study is approximately 85 miles long (100 miles with connections to the MIC, seaports, etc.). The overall study area spans approximately 1 mile on either side of the FEC corridor (2-mile width overall) and covers approximately 200 square miles. The study area is in the highly urbanized eastern portions of Miami-Dade, Broward, and Palm Beach Counties which constitutes Southeast Florida. The FEC Railway corridor currently traverses 28 cities along the coast, mostly along their CBD's. Within each of the CBD's there are major activity and employment centers, recreational facilities, educational centers, hospital complexes, tourist destinations, and major retail developments. The entire study area boundary affects a total of 47 cities which are all listed in **Table 0.1**. Three seaports are connected to the FEC and there is the potential to connect three regional airports: Miami International Airport (MIA), Ft. Lauderdale-Hollywood International Airport (FLL), and Palm Beach International Airport (PBIA).

0.2. Purpose and Need

The region's eastern cities are witnessing a surge in urban redevelopment as people and businesses continue to migrate to coastal Southeast Florida. The existing and proposed highway capacity network planned for the study area alone will not be able to accommodate the travel demand market evident and projected in this north-south corridor. Due to highway capacity constraints, commuting times in the region are expected to triple over the year 2000 levels by the year 2020.

Regional premium ("fixed guideway") transit system improvements are needed along the South Florida East Coast Corridor (SFECC), generally defined by the alignment of the FEC Railway, to improve mobility and reduce delays between the CBD's, major economic centers, transportation hubs and residential communities.

The SFECCTA DPEIS and Transit Feasibility/Alternative Analysis will identify alternate modes of transportation focused on increasing capacity to freight and passenger mobility as well as addressing the

anticipated increase in travel demands along this highly urbanized, traffic congested eastern portion of Miami-Dade, Broward, and Palm Beach Counties, Florida.

Table 0.1: Municipalities in SFECCTA Study Area

Miami-Dade (10)	**Palm Beach (26)**
Miami*	Boca Raton*
Miami Beach	Boynton Beach*
Hialeah	Briny Breezes
El Portal*	Cloud Lake
Miami Shores*	Delray Beach*
Biscayne Park*	Glen Ridge
North Miami*	Gulf Stream
North Miami Beach*	Highland Beach
Aventura*	Hypoluxo
Miami Springs	Jupiter*
	Lake Clarke Shores
Broward (10)	Lake Park*
Dania Beach*	Lake Worth*
Deerfield Beach*	Lantana*
Ft. Lauderdale*	Manapalan
Hallandale Beach*	Mangonia Park*
Hollywood*	North Palm Beach*
Lazy Lake	Ocean Ridge
Lighthouse Point*	Palm Beach
Oakland Park*	Palm Beach Gardens*
Pompano Beach*	Palm Beach Shores
Wilton Manors*	Riviera Beach*
	South Palm Beach
Martin (1)	West Palm Beach*
Jupiter Island	Jupiter Inlet Colony
* = Cities traversed by FEC Railway	Tequesta

Source: Miami-Dade Municipalities: In-House GIS Records; Broward Municipalities: Broward Co. Department of Planning and Environmental Protection, Planning Services Division (2003); Palm Beach Municipalities: In-House GIS Records. Note: Martin County included in study area solely for consideration of potential staging areas or maintenance facilities along/within the FEC Railway corridor in extreme southeastern Martin County.

0.3. Methodology of Tier 1 Programmatic EIS, Environmental Streamlining

A Technical Memorandum was prepared detailing the rationale for the Tiered Environmental Impact Statement (EIS) process. The methodology to be employed in both Tiers of the study include specific tiered methodologies for environmental issues (Socio-cultural Effects, Wetlands/Essential Fish Habitat, and Noise/Vibration), and illustrates the timeline for submitting required project documentation to the FTA for approval and federal funding eligibility. The SFECCTA Tiered Programmatic EIS Methodology

Technical Memorandum is available for review upon request and from the project website at www.sfeccstudy.com/documents/html.

Completing a Tiered EIS for particularly large projects may significantly reduce the amount of time needed to complete the NEPA process. For large projects, the local transit agency can complete an EIS to evaluate a broad program or a policy statement. Subsequent assessments (EIS, Environmental Assessment, or Categorical Exclusion) can then be prepared for site-specific actions, summarizing only the issues discussed in the broader statement. In addition, tiering a study reduces repetitive discussion of the same issues, allowing agencies to focus attention on issues that are ready for a decision (www.environment.fta.dot.gov/DECISION/PROC.ASP). Tiering in this study involves preparing and circulating a Tier 1 Draft PEIS (a "Programmatic" document addressing potential right-of-way, railroad crossing or other "programs" that may be carried forth into Tier 2), with detailed environmental analysis and public involvement to be continued and expanded as necessary for each individual segment studied in Tier 2. In addition, the Final DPEIS will include initial public comment and agency input on the location and design of the proposed alternatives that may be evaluated in Tier 2 project-level NEPA analysis.

0.4. Alternatives Considered

Various alignments and modal technologies have been considered for serving the study area. Based on initial analysis, potential service markets were identified along the corridor and divided into service segments. Each service segment was analyzed for a combination of the most appropriate alignments and modal technologies. There are six service segments each with several technologies along the FEC, US-1 and I-95 alignments. Three additional service segments were included to represent service along the entire FEC corridor with differing end points to test and compare ridership potential between segments and the No-Build alternative. The effects of a Transportation Systems Management (TSM) alternative and a No-Build alternative were developed and evaluated. Surviving technologies, after the initial screening, included Bus Rapid Transit (BRT), Light Rail Transit (LRT), Regional Bus (RGB), Rapid Rail Transit (RRT) and Regional Rail (RGR). Overall a total of 36 alternatives were developed for analysis in Tier 1.

0.5. Environmental Effects

Due to the large size of the study area there are potential impacts to neighborhoods and communities, historic and archeological resources, parkland and recreational areas, biological and natural resources for each of the alternatives considered. In addition, potential impacts to air quality, the viewshed and noise and vibration will be considered. Due to the large number of alternatives being considered, the individual and/or cumulative effects on environmental resources cannot be detailed at this stage. **Tables 5.1- Table 5.3** in Chapter 5 summarize the potential impacts for the various alignments developed for use in the Tier

1 screening process. The environmental impacts will vary according to the specific technology chosen within the preferred alternative. For example, the regional rail and light rail alternatives will need to be specifically analyzed for noise and vibration issues. All of the alternatives evaluated are along existing alignments, the FEC Railway (including adjacent portions of Dixie Highway in Miami-Dade and Broward Counties and SR A1A in Palm Beach County), US-1 and I-95. The environmental impacts associated with the implementation of a premium transit service alternative will depend to a large extent upon the nature of the existing human (i.e. built) and natural resources adjacent or in close proximity to the existing alignments along US-1, I-95, and the FEC Railway corridor. However, displacement potential for new transit alternatives along the urbanized corridors of US-1 and I-95 are much more likely than along the FEC Railway.

0.6. Evaluation of Alternatives

The Tier 1 screening process included an evaluation of the various service markets and available technologies. Population and employment densities as well as travel patterns were used to identify the potential service markets. Based on this data, and an assessment of the applicability of the various technologies available for use in the corridor, several technologies were eliminated from consideration since they did not meet the needs established for each of the service markets. Potential alignments were narrowed to I-95, US-1 and the FEC in the northern section of the corridor and to US-1 and the FEC along the remainder of the corridor. The I-95 corridor south of West Palm Beach is effectively included as part of the TSM alternative due to its proximity to Tri-Rail. Moreover, as indicated early on in the analysis, production and attractions along this corridor were significantly less than along other alignments.

Evaluation of transportation and environmental impacts for each of the alternatives was based on the best information available. Further screening of the various alternatives was based on cost, ridership estimates, transportation impacts and an environmental impacts assessment. An evaluation matrix (**Table 5.4** in Chapter 5) was developed for each of the alternatives. The matrix evaluation supported the elimination of all of the US-1 alternatives in each service market and the I-95 Regional Rail alternative in Service Segment 1 from further consideration and analysis in Tier 2. Reasons for the elimination included cost, ridership and potential environmental impacts. Specifically, the eliminated alternatives provided very little ridership for a more significant cost than other alternatives and the environmental impacts included potential displacements of residential properties along the I-95 corridor in Service Segment 1 and displacements of businesses along the US-1 corridor.

0.7. Mitigation Measures

Because a preferred alignment or technology will not be identified at the end of the Tier 1 analysis, mitigation measures have yet to be developed or discussed. However, some overall measures relating to noise and vibration for the alternatives along the FEC have been discussed during the public meeting process. More specific mitigation measures for noise, ground borne-vibration and/or other adverse social, economic and environmental impacts will be identified during Tier 2 studies.

0.8. Coordination, Consultation, and Comments

Extensive coordination and consultation was conducted throughout the Tier 1 process with various federal, state, and local government agencies as well as the public. Agency Scoping meetings were held as were Public Kick off meetings. In addition, project documentation and study technical memorandum have been loaded into the FDOT Efficient Transportation Decision Making (ETDM) website (the project is undergoing "screening" by participating federal, state and local agencies under ETDM Project Number 7519). Both the FHWA and FTA have stated that FDOT's ETDM process satisfies the cooperating agency intent outlined in the SAFETEA-LU regulations. Only the Federal Railroad Administration (FRA) and the U.S. Coast Guard (USCG) have been identified as individual cooperating agencies. A public involvement plan was adopted and implemented with public workshops and hearings, municipal agency workshops, business one-on-ones, individual meetings with stakeholders, newsletter production and website development, as well as extensive community coordination.

0.9. Issues to be Resolved

Issues to be resolved in Tier 1 include the following:

- Logical and independent segments of the corridor will be recommended for further analysis in Tier 2.
- Segmental priorities will be recommended based on results of the technical analysis, financial feasibility and local MPO support. Close coordination with the public and the cooperating local agencies will also provide information to help make these decisions regarding segmental prioritization.

0.10. Tier 1 Decisions

Tier 1 decisions include:

- Agreement on viable options to move forward for further analysis in Tier 2. The viable options consist of:
  - BRT along the entire FEC corridor
  - LRT along the entire FEC corridor
  - RGR along the entire FEC corridor
  - RRT on FEC along Service Segments 5 and 6
  - RGB along I-95 in Service Segment 1
  - Segment 1 and 2 North end connections: Option 2C – Canal C-17 frontage, Option 3B – FP&L alignment at Riviera Beach, Option 5A – Waterworks connection
  - TSM improvements (including Tri-Rail and local bus)
- Agreement on the non-viable options that will not proceed to Tier 2 analysis. These non-viable options consist of:
  - All the US-1 alignment alternatives, which are significantly more expensive, are less productive in terms of ridership, and generate more negative environmental impacts than their counterparts using the FEC alignment.
  - The I-95 Regional Rail alternative along Service Segment 1, which is the most costly alternative in terms of cost per mile, is the least productive alternative in terms of ridership, and has significant negative environmental impacts. Use of the I-95 alignment for alternatives south of West Palm Beach was eliminated due to the minimal number of attractors within reasonable walking distance of the I-95/Tri-Rail alignment (see **Figure 2.4** in Chapter 2). Moreover, given the presence of Tri-Rail immediately adjacent to I-95 south of West Palm Beach, alternatives involving the I-95 alignment are effectively included in the No-Build and TSM alternatives.
  - Any service north of Jupiter, since the Tequesta station generates little ridership and a reliable corridor service across the Loxahatchee River would require an expensive high-level bridge crossing. Connections between the Tequesta community and the rest of the corridor using feeder bus service will be further considered, however, in Tier 2.
  - Segments 1 and 2 north end connections options: 1, 2A, 2B, 3A, 3C, 4A, 4B, 5B, 5C and 6.
  - Technologies including High Speed Ferries (HSF), Electric Bus/Streetcar, Guided Bus/Rapid Guided Bus, Intercity Motor Coach, Automated Guideway (AGT, or Peoplemover), Monorail, Rubber-tired Rapid Transit (RTR), or High Speed Rail (Maglev, electric, or other).

- Environmental NEPA decisions will also result from the Tier 1 analysis, including a tiered analysis of cultural resources due to the magnitude of the study area and volume of the resources, a tiered analysis of noise and ground-borne noise and vibration, and identification of where there are navigation issues to be resolved in Tier 2.

0.10.1. Agreement on further study in Tier 2

Agreement on further study in Tier 2 of the:

- Development of a proactive strategy to reduce the number and/or community impacts and enhance the safety of at-grade highway crossings of the FEC alignment.

- Preliminary station locations including park-and-ride locations. To avoid overburdening other stations in Jupiter and Palm Beach Gardens with intra-regional trips originating north of the study area (Martin and St. Lucie Counties), a significant park-and-ride facility is particularly recommended in the vicinity of PGA Boulevard due to that location's superior access to I-95 and Florida's Turnpike. As indicated in Chapter 2, the land uses surrounding Jupiter and Palm Beach Gardens are more residential and the public process supported minimal parking for external origin trips at these proposed station area locations.

- Preliminary O&M facility locations. These could still possibly include locations north of Jupiter that would not require a high-level crossing of the Loxahatchee River.

- Agreement on the logical limits and relative priorities for segments moving forward for further individual analysis in Tier 2. These limits refer to study limits and not necessarily to implementation phasing. The recommendations are based on the analysis of forecasted travel patterns of the six service segments considered in Tier 1 which were subdivided and reconsolidated. Three subcorridor segments and one corridor-length segment were identified reflecting forecasted travel patterns and markets, listed in priority order as follows:
  - South Corridor Segment: Extending north from Miami Government Center through Fort Lauderdale to an interchange station with Tri-Rail in the vicinity of the Pompano Beach Station via the FEC alignment (encompassing Service Segments 4, 5, and 6).
  - North Corridor Segment: Extending north from an interchange with Tri-Rail at West Palm Beach Station to Jupiter either via Mangonia Park Station (Service Segment 1) or via the Warterfront Connection/Banyan Boulevard to the FEC alignment in West Palm Beach (the northern portion of Service Segment 2).

- Central Corridor Segment: Extending between West Palm Beach Station and an interchange with Tri-Rail in the vicinity of Pompano Beach Station via the FEC alignment (the southern portion of Service Segment 2 and Service Segment 3).
- South East Florida Corridor Segment: Extending the entire length of the corridor and overlaying the South, Central and North Corridor Segments, this "segment" addresses inter-segment travel issues and coordination as well as overarching corridor issues common to all segments (e.g.: Amtrak and freight operations, design standards, express and premium longer-distance travel markets).

0.11. Draft PEIS Conclusions, Commitments, and Recommendations

Conclusions, Commitments, and Recommendations will be finalized after a public hearing is held and will be articulated in the Final PEIS. However, coordination regarding cultural resources has been undertaken with the Florida State Historic Preservation Office (SHPO). It is important to note that historic linear resources that will require further research and documentation during the Tier 2 phase were encountered during the reconnaissance survey. These include potentially significant roadways, canals, and railroad corridors such as the FEC Railway, US-1, Dixie Highway, Miami Canal, and other major canals related to the Everglades Drainage District. Due to the nature of these resource types and the major intent of this phase of the project, they are not included in the report but will be covered more thoroughly in Tier 2. On June 9, 2006 a meeting was held with Sherry Anderson, SHPO representative, in order to discuss historic linear resources related to this project. It was established that until more specific information about the types of improvements that may affect historic linear resources is determined, a definitive approach for Tier 2 cannot be developed at this time. In addition, the FDOT Environmental Management Office, in conjunction with the FHWA, is currently working on specific cultural resource issues including historic linear resources. It is possible a protocol for the identification, documentation, and evaluation of such resources will be in place for the Tier 2 cultural resources studies. Specific commitments, in the Tier 1 DPEIS, will be to further evaluate environmental resources and cultural resources in Tier 2 once the segments and Class of Action determinations have been made. These Class of Action determinations will not be made until the beginning of Tier 2.

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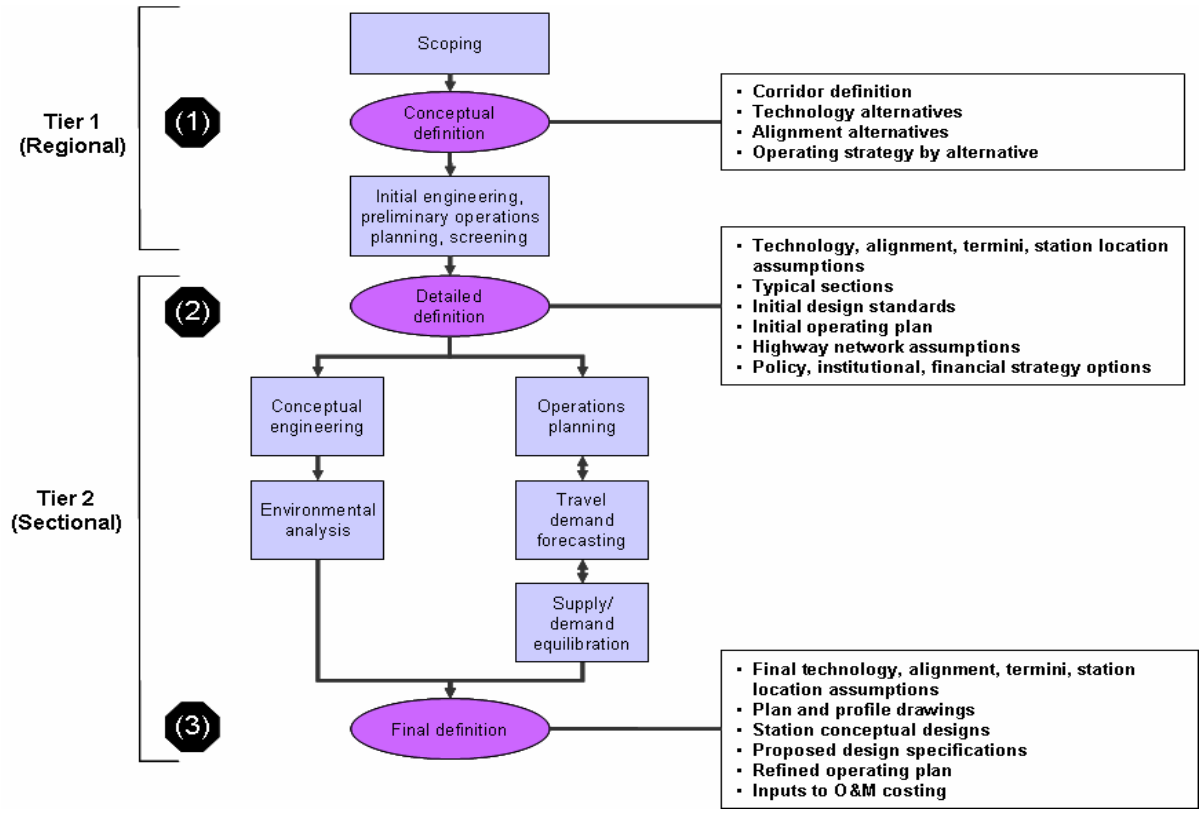
1.1. Planning Context and Relevant Planning Results

1.1.1. Relation to FTA New Starts Process

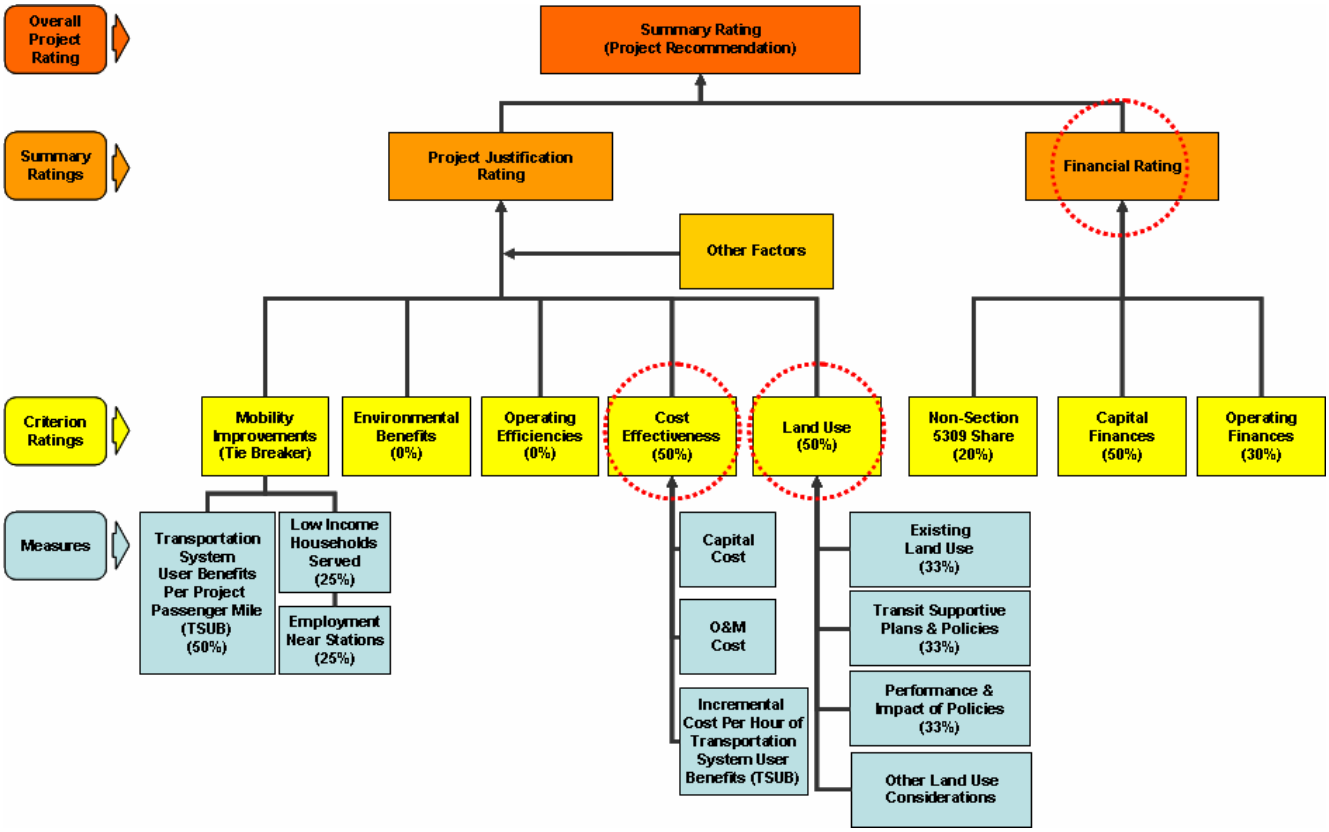
This is an Alternatives Analysis (AA) study for potential transit service within the South Florida East Coast Corridor (SFECC) study area consistent with the FTA New Starts planning provisions contained in the Safe, Accountable, Flexible, and Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU) federal legislation (Public Law 109-59). The study name is the South Florida East Coast Corridor Transit Analysis (SFECCTA). Information on the SFECCTA study is also available on the project website at www.sfeccstudy.com. The AA is being coordinated with the environmental review required by NEPA through a first-tier (EIS) or Programmatic Environmental Impact Statement (PEIS). **Figure 1.1** depicts how this Tier 1 PEIS/AA process is consistent with FTA's steps in the development of alternatives. FTA's alternatives development process is a three step process and this Tier 1 PEIS/AA study completes the first step. As further described in Chapter 2, through scoping and initial screening of technology and alignment alternatives, a set of conceptual alternatives are being recommended for further detailed definition in Tier 2.

Figure 1.1: FTA Steps In the Development of Alternatives



Once in Tier 2, this study will provide the necessary documentation to satisfy FTA's New Starts criteria as depicted in **Figure 1.2**. As indicated in **Figure 1.2**, the most important FTA factors in terms of weight are cost effectiveness, land use and financial rating. However, other factors such as those supportive of economic development and environmental justice have been added in the New Starts evaluation criteria. Therefore, the ultimate project(s) identified in Tier 2 will be justified based on a comprehensive review of its mobility improvements, environmental benefits, cost effectiveness, operating efficiencies, economic development benefits and transit supportive land use. An initial assessment of transit supportive land uses and financing options available to enhance the financial rating are detailed in Chapter 2. The ability of a project within this corridor to enhance economic development opportunities and mobility for transit-dependent individuals is addressed in the purpose and need and environmental impacts sections.

Figure 1.2: FTA New Starts Evaluation and Rating Framework



1.1.2. Prior Studies

The purpose and need for the project is supported by a large number of studies that have focused on the FEC Railway corridor and the solutions needed to address transportation demand. More detailed information regarding the numerous studies can be found in a technical memorandum titled "SFECC Summary of Prior Studies", which is available upon request. More than 50 studies have been completed regarding the FEC Railway corridor in previous decades; about 50 percent of them were carried out in the

past 10 years. Several of these studies are conducted on a continuous basis (every one to five years) as per federal, state and local regulations. Other studies are comprehensive or "bigger picture" studies of transportation systems managed by agencies that have a particular interest in the study. The third type of studies can be appropriately categorized as coordinated studies, which highlight the need for coordination of planning efforts on a regional basis. Although all the studies carried out in the past can be considered important for the purpose of analysis, some of them are more pertinent to the SFECCTA study. The following categorizes the prior studies by their scope:

- Continuous studies (updated every 1 – 5 years)
  - Strategic Intermodal System (SIS)
  - Long Range Transportation Plans (LRTP)
    - Broward
    - Miami-Dade
    - Palm Beach
  - Florida Rail System Plan
- Comprehensive studies
  - FEC Strategic Intermodal System Needs Study
  - Florida Freight Network & Modal Linkages System Study Phase II
  - Latin American Trade & Transportation Study
  - South Florida Transit Analysis Study
  - Tri-Rail Long-Range Master Plan
- Coordinated studies
  - Joint Study to Rationalize Rail Transportation Assets in Southeast Florida
  - FEC Corridor Strategic Redevelopment Plan
  - Intermodal Connectivity in the Atlantic Commerce Corridor
  - Various freight studies
  - Seaport and Airport Master Plans
  - Corridor Studies and AA's (Jupiter Extension, Northeast Dade, Central Broward)
  - Various roadway, High Occupancy Vehicle (HOV), intermodal and transit studies

The generalized conclusions and/or recommendations from various studies are summarized below.

- CSX Transportation (CSXT) Railway, FEC Railway, and the South Florida Rail Corridor (SFRC) are strategic corridors in the passenger and freight network of the region.
- Access to/from seaports for truck traffic is an important issue that needs to be addressed and several projects have been proposed.

- Due to the dramatic increase in population and vehicle miles traveled (VMT) in South Florida, goods movement through South Florida's ports will increase in the future.

- There is a need for alternatives to the existing congested roadways (I-95 and US-1) facilitating north-south movement for both passengers and freight.

- More than 50 percent of the studies in Miami-Dade County recommended enhanced transit service (BRT, Contraflow Bus Lanes, adding more service) on Biscayne Boulevard in the SFECCTA Corridor. In downtown Miami, studies recommended Light Rail Transit service.

- Most studies in Broward County do not identify a specific transit project for north-south movement in the county as it relates to SFECCTA Study Area. However, several cities (Deerfield Beach, Hallandale Beach, City of Hollywood, Dania Beach, Fort Lauderdale, City of Oakland Park and Wilton Manors) are making amendments to their land use plans along the FEC rail line. These land use changes are transit-oriented.

- In Palm Beach County, studies recognized the importance of US-1 and identified improved public transportation projects in the corridor. Furthermore, several cities and the transit agency are working on Transit-Oriented Development (TOD) station area planning projects and developing transit design guidelines.

- All freight studies stress safety issues with respect to at-grade crossings along the FEC Railway.

- Studies generally concurred that improvements are required for north-south movement in the three-county region for both passenger mobility and freight movement and such strategic improvement projects would involve the FEC Railway due to its strategic location.

- One significant study in support of additional north-south transit service in the southeast corridor of Florida is the October 1995 Governor's Commission report entitled *Eastward Ho! Revitalizing Southeast Florida's Urban Core* (http://www.sfrpc.com/eho/report.htm). The report explored ways to encourage infill and redevelopment of lands in the South Florida tri-county area not adjacent to the Everglades. This initiative was developed to protect the environment, encourage compact, efficient development patterns and to forge public/private partnerships to promote compact urban density. The Eastward Ho! Initiative, coupled with rapid growth, traffic congestion and limits on available developable land, have spurred a large amount of redevelopment in the tri-county area, mostly in the CBD's of the medium to large cities along the corridor. Much of this redevelopment is occurring along the FEC Railway where previously industrial uses are being converted to mixed-use higher density developments. Although the FEC currently supports only freight rail traffic, it does have a long and

early history of passenger service. As indicated in the Eastward Ho! Report, the South Florida tri-county area is where 44 percent of the region's population currently resides. Complimentary to this initiative and in support of the compact development envisioned, transit options along the FEC were identified in the report.

1.1.3. Study Area Description

Based on reviews of prior studies and other relevant information, the study area developed for this Tier 1 DPEIS is centered along the FEC Railway, bounded on the north by the City of Tequesta in Palm Beach County and on the south by the CBD of the City of Miami with potential connections west to the Miami Intermodal Center (MIC) located adjacent to Miami International Airport (MIA) and the City of Hialeah. The segment of the FEC Railway corridor under study is approximately 85 miles long (100 miles with the connections to the MIC, seaports, etc.) and the overall study area, which spans approximately 1 mile on either side of the corridor (2-mile width overall), covers over 200 square miles. The study area is in the highly urbanized eastern portions of Miami-Dade, Broward, and Palm Beach Counties which constitutes Southeast Florida. Based on the 2000 Census, these counties are the three most populous in the state ranging from 2,253,362 individuals in Miami-Dade, 1,623,018 in Broward and 1,131,184 in Palm Beach. Palm Beach County is the largest county in land area (2,578 square miles) in the state. Moreover, four of the top 10 most populous cities in the state, Miami, Hialeah, Ft. Lauderdale and Hollywood are in the study area. The area is a diverse, dynamic, expanding coastal metropolitan area that is the largest in Florida. Due to its significant growth in population and employment, and expected to continue for decades, the Census Bureau recently classified the tri-county urbanized area as the sixth largest Metropolitan Statistical Area (MSA) in the country. A Study Area Location Map is included below (**Figure 1.3**).

The FEC Railway is an established transportation corridor, the only one east of I-95 capable of moderate to high operating speeds (above 25 mph), with potential passenger connections to:

- MIC at MIA,
- Ft. Lauderdale/Hollywood International Airport (FLL),
- Existing regional premium transit service (Tri-Rail) along SFRC,
- Existing regional premium transit service (Metrorail) in Miami-Dade County,
- Three existing seaports at the Port of Palm Beach (PPB), Port Everglades (PEV) in Ft. Lauderdale and the Port of Miami (POM),
- Three major CBD's: Miami, Ft. Lauderdale and West Palm Beach.

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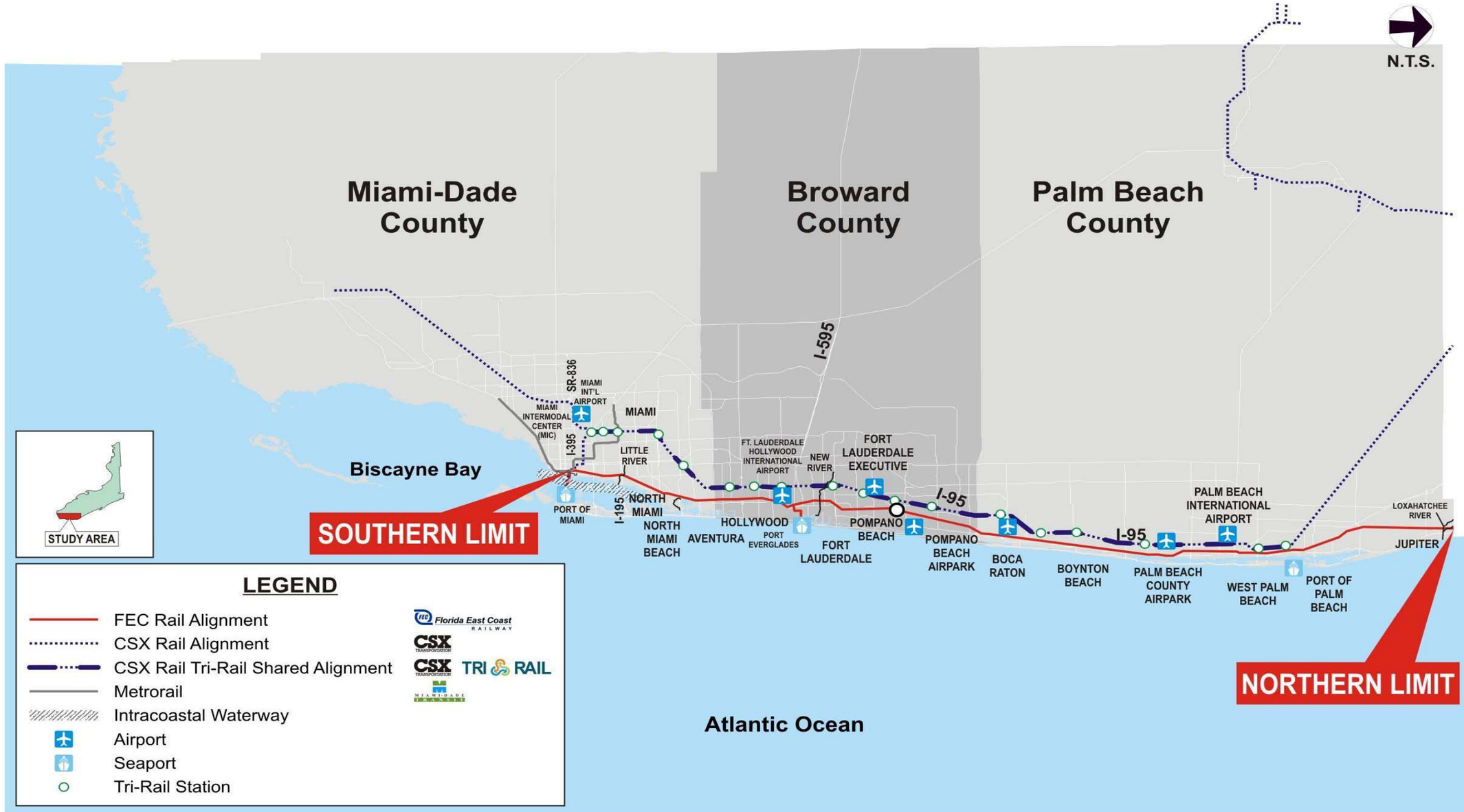
Figure 1.3: Study Area Location Map



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Due to these significant existing and potential connections, the FEC corridor is included as part of Florida's Strategic Intermodal System (SIS). Florida's SIS is made up of statewide and regionally significant facilities and services for moving both people and goods, including linkages that provide for smooth and efficient transfers between modes and major facilities. The movement of goods provided by the FEC Railway is for local market consumption as well as export. Their current average of daily trains (26 in both directions) is anticipated to grow in the future. Because the goods moved are mainly consumed locally, the amount of goods movement to the area is positively related to the growth in population. Additionally, with the growth in international trade common to the South Florida area, growth in goods movement related to exports will also continue.

As indicated in the study area map (**Figure 1.3**), the FEC Railway corridor currently traverses 28 cities along the coast, mostly along their CBD's. Within each of the CBD's there are major activity and employment centers, recreational facilities, educational centers, hospital complexes, tourist destinations, and major retail developments. The entire study area boundary affects a total of 47 cities which are all listed in **Table 1.1**. **Figure 1.4** provides sample photographs (aerial and ground shots) of various areas within the SFECCTA study area.

In order to support the initial AA process, the Purpose and Need for the project must be established. The remaining sections of this chapter detail the Purpose and Need for the expansion of premium transit services within the study area which is centered along the FEC Railway corridor.

Table 1.1: Municipalities in SFECCTA Study Area

Miami-Dade (10)	**Palm Beach (26)**
Miami*	Boca Raton*
Miami Beach	Boynton Beach*
Hialeah	Briny Breezes
El Portal*	Cloud Lake
Miami Shores*	Delray Beach*
Biscayne Park*	Glen Ridge
North Miami*	Gulf Stream
North Miami Beach*	Highland Beach
Aventura*	Hypoluxo
Miami Springs	Jupiter*
	Lake Clarke Shores
Broward (10)	Lake Park*
Dania Beach*	Lake Worth*
Deerfield Beach*	Lantana*
Ft. Lauderdale*	Manapalan
Hallandale Beach*	Mangonia Park*
Hollywood*	North Palm Beach*
Lazy Lake	Ocean Ridge
Lighthouse Point*	Palm Beach
Oakland Park*	Palm Beach Gardens*
Pompano Beach*	Palm Beach Shores
Wilton Manors*	Riviera Beach*
	South Palm Beach
Martin (1)	West Palm Beach*
Jupiter Island	Jupiter Inlet Colony
* = Cities traversed by FEC Railway	Tequesta

Source: Miami-Dade Municipalities: In-House GIS Records; Broward Municipalities: Broward Co. Department of Planning and Environmental Protection, Planning Services Division (2003); Palm Beach Municipalities: In-House GIS Records
Note: Martin County included in study area solely for consideration of potential staging areas or maintenance facilities along/within the FEC Railway corridor in extreme southeastern Martin County.

Figure 1.4: FEC Railway Corridor Overview

Photo 1: FEC Railway in Hallandale Beach, Florida, with mixed commercial, industrial, and residential land uses (note multiple, closely spaced roadway crossings). Broward County, October 2004.

Photo 2: FEC Railway with double tracks, roadway and waterway crossing, and mixed commercial/residential land use. Miami-Dade County , October 2004.

Photo 3: FEC Railway in West Palm Beach, (Palm Beach County Courthouse in background), Palm Beach County, October 2005.

Photo 4: FEC Railway in Ft. Lauderdale/Hollywood International Airport interchange, with Port Everglades in background, Broward County, May 2004

Photo 5: Typical section of FEC Railway with 100 foot Right-of-Way and mixed land uses (commercial/residential) in Miami-Dade County, May 2004

1.2. Purpose and Need for Transportation Improvements

The Purpose and Need statement for the project is:

"The eastern cities of Miami-Dade, Broward and Palm Beach Counties are witnessing a surge in urban redevelopment as people and businesses continue to migrate to coastal Southeast Florida. The existing and proposed highway capacity network for the SFECCTA corridor will not be able to accommodate the travel demand market evident and projected in this north-south corridor. Due to highway capacity constraints, commuting times in the region are expected to triple over the year 2000 levels by the year 2020. Therefore, regional premium ("fixed guideway") transit system improvements are needed along the SFECCTA area, generally defined by the alignment of the FEC Railway, to improve mobility and reduce delay between the CBDs, major economic centers, transportation hubs and residential communities. The SFECCTA PEIS and Transit Feasibility/AA will identify alternate modes of transportation focused on providing increased capacity to freight and passenger mobility as well as addressing the anticipated increase in travel demands along this highly urbanized, traffic congested eastern portion of Miami-Dade, Broward, and Palm Beach Counties, Florida."

Following FTA and FHWA guidance for establishing need in an AA process, the following section addresses the key areas of Transportation Demand (capacity and roadway deficiency issues); System Linkage; Federal, State or Local Government Authority (legislation); Social Demands or Economic Development; Modal interrelationships; and Safety.

1.2.1. Transportation Demand

- Problem: The areas with the highest concentrations of productions and attractions (population and employment) are currently not directly served by a continuous premium transit service.

- Problem: Future population and employment densities are located in areas where transportation infrastructure is deficient.

- Problem: Major origins and destinations along the eastern tri-county area are not within walking distance (0.5 miles) of a continuous premium transit service.

- Problem: Roadway capacities in the study area are deficient, particularly along alternative north-south corridors. Roadway congestion contributes to the unreliability of travel (variation in travel times) and delays due to incidents and crashes, weather, and other factors that disproportionately impact personal and business travel. Moreover, increased congestion adversely impacts mobility of street transit, such as buses, and ultimately the air quality of the area.

- Problem: The system wide congestion apparent in the study area, and more specifically along some of the parallel corridors to the FEC Railway, justifies the need for additional transportation capacity to address travel time and speeds for the movement of people. South Florida commuters are estimated to lose 1½ weeks in congested traffic annually, a 53 percent increase since 1990 (Texas Transportation Institute, 2002 Urban Mobility Study). Congestion costs (lost time and added fuel) are estimated at $2.7 billion a year and are a critical issue to business and government leaders who are concerned about the economic sustainability of this vital region.

- Problem: Transit demand in the study area is high but needs better coordination for system efficiencies.

- Problem: The demand for the movement of goods via freight is increasing beyond rail capacities in the study area.

- Problem: Seaport and airport needs cannot be met by the current transportation system due to continued growth patterns in the study area.

Need: A comprehensive transportation investment is necessary in the study area to meet the demand associated with roadways, transit, rail, land uses, seaports and airports.

- Proposed Action – A transit project along the FEC Railway corridor area:

  - Would bring the transit service to where people and jobs are currently located (productions and attractions) and projected to be located in the future.
  - Would bring premium transit service within walking distance of major origins and destinations.
  - Would provide an alternative to roadway congestion in the area for daily commuters.
  - Would allow for better transit service coordination in the region.
  - Would provide opportunities for additional freight capacity enhancements to serve growing needs at adjacent seaports and airports.

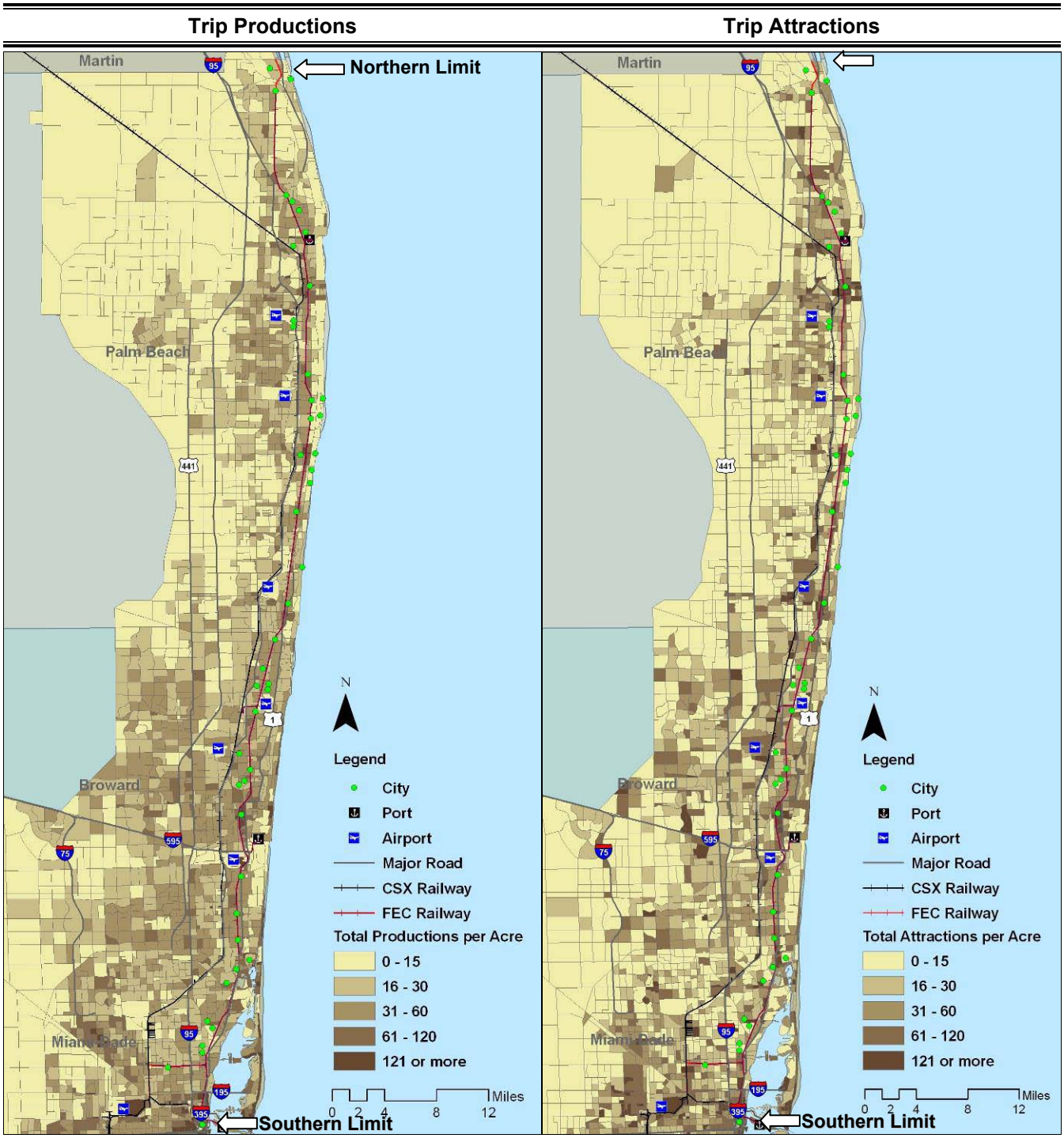
Traffic Demand

The Southeast Regional Planning Model (SERPM), the tri-county region travel demand forecasting model, was used to analyze the overall study area characteristics. The SERPM is based on information from the three respective county Metropolitan Planning Organizations (MPO) with respect to socio-economic data such as land uses that produce or generate trips and those that attract trips (productions and attractions). The SFECCTA corridor study process also included two types of travel surveys to perform validity checks on the SERPM model and to provide meaningful backup of the model results with

real data. The two surveys, conducted in January 2006, were a License Plate Origin-Destination (O-D) Survey on major north/south roadways in the SFECCTA corridor area and a Transit On-Board survey for certain bus routes operating in a north/south direction within 0.5 miles of the FEC Railway corridor. The validity checks provided additional information regarding the travel patterns in the area, trip lengths, trip purposes and demographic characteristics.

Based on the SERPM, the 2030 trip productions and attractions within the tri-county area confirms that the most intense attractions are located within the SFECCTA study area, which is east and along the coast of each of the counties (**Figure 1.5** – Trip Attractions, see darker shades). These areas include the major CBD's and commercial corridors of the cities along the FEC as well as adjacent key employers such as airports and seaports. A similar pattern is evident for productions (**Figure 1.5** – Trip Productions) where the eastern areas exhibit greater densities. Due to the limited availability of land in Broward County, it's density of productions is more evident throughout the entire county.

Figure 1.5: Trip Productions and Attractions (2030)



The proposed project would provide transit service within walking distance of major origins and destinations based on year 2030 projections. More specific information regarding productions and attractions was derived from the model with respect to the three main north-south corridors in the study area: I-95, US-1 and the FEC Railway. Five main peaks were identified for productions, attractions and combined productions and attractions within 0.5 mile of these corridors. As indicated in **Figure 1.6 – Figure 1.8**, Miami, Ft. Lauderdale, Boca Raton, Boynton Beach and West Palm Beach were the five areas where productions and attractions were highest along both US-1 and the FEC. The productions and attractions along the I-95 corridor, where Tri-Rail is located, were significantly lower, more consistent throughout the study area, with no discernable peaks.

Figure 1.6: Productions and Attractions within 0.5 mile of US-1, I-95 and FEC

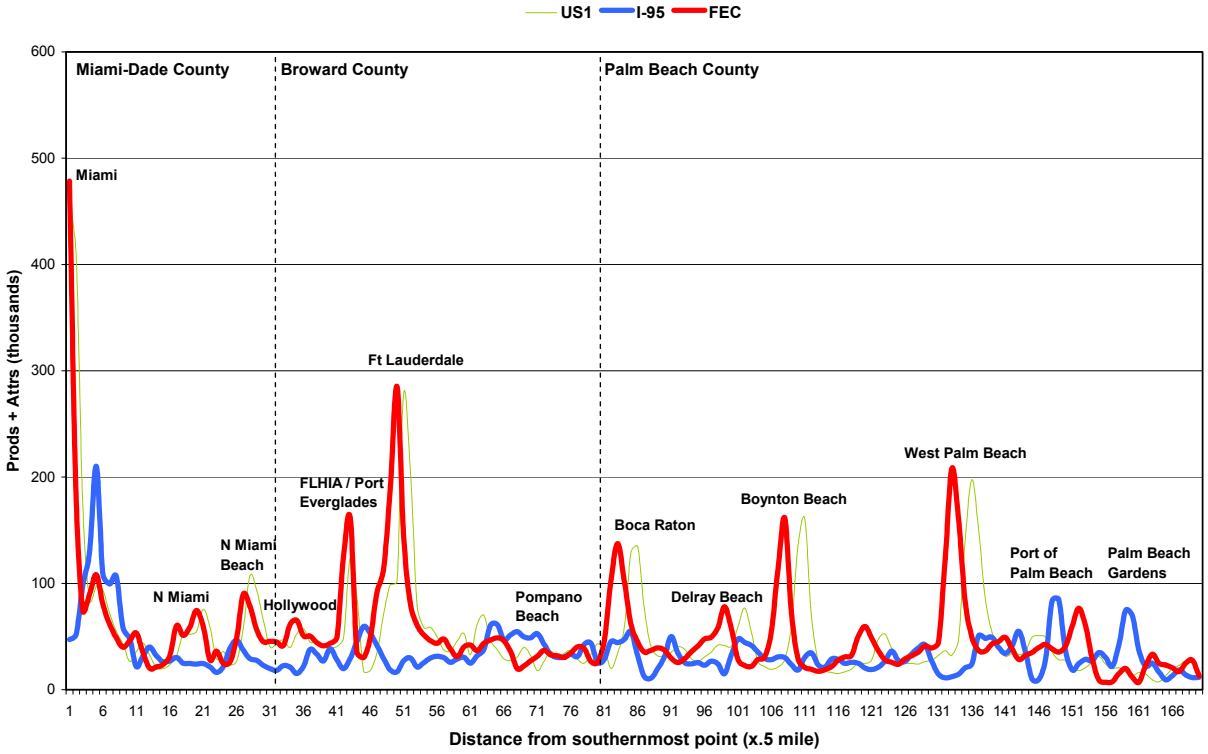


Figure 1.7: Attractions within 0.5 mile of US-1, I-95, FEC

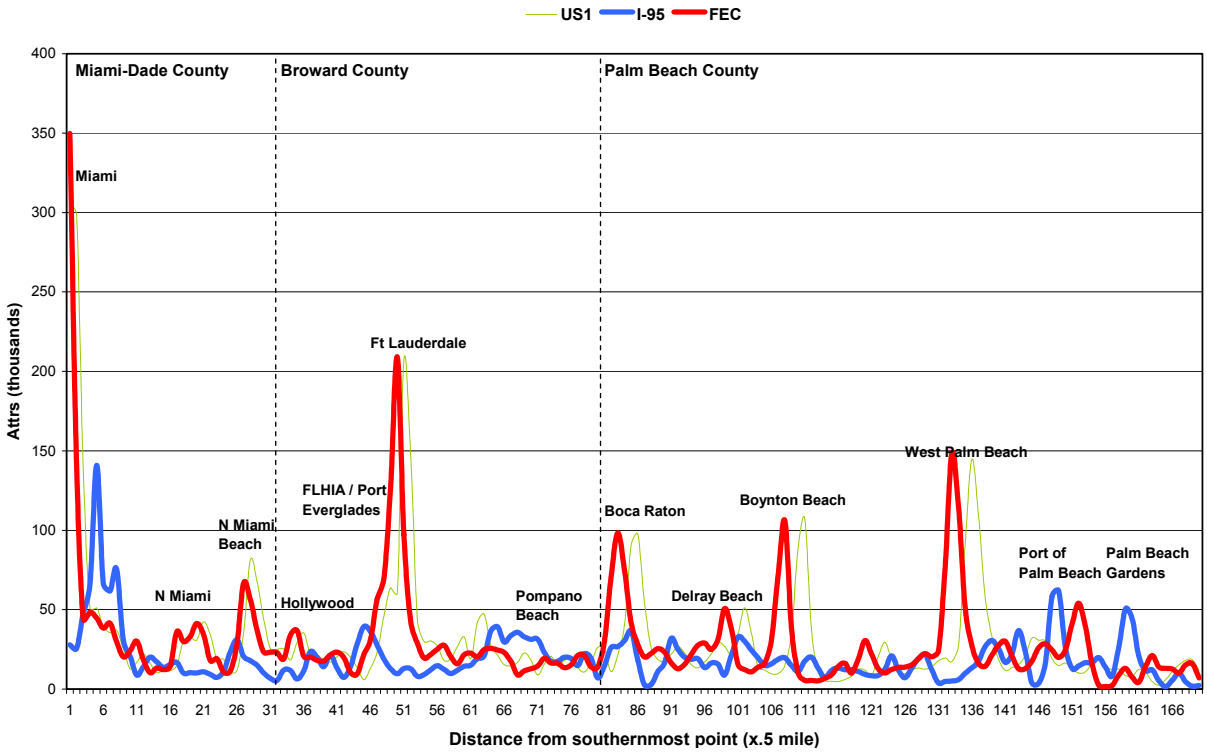
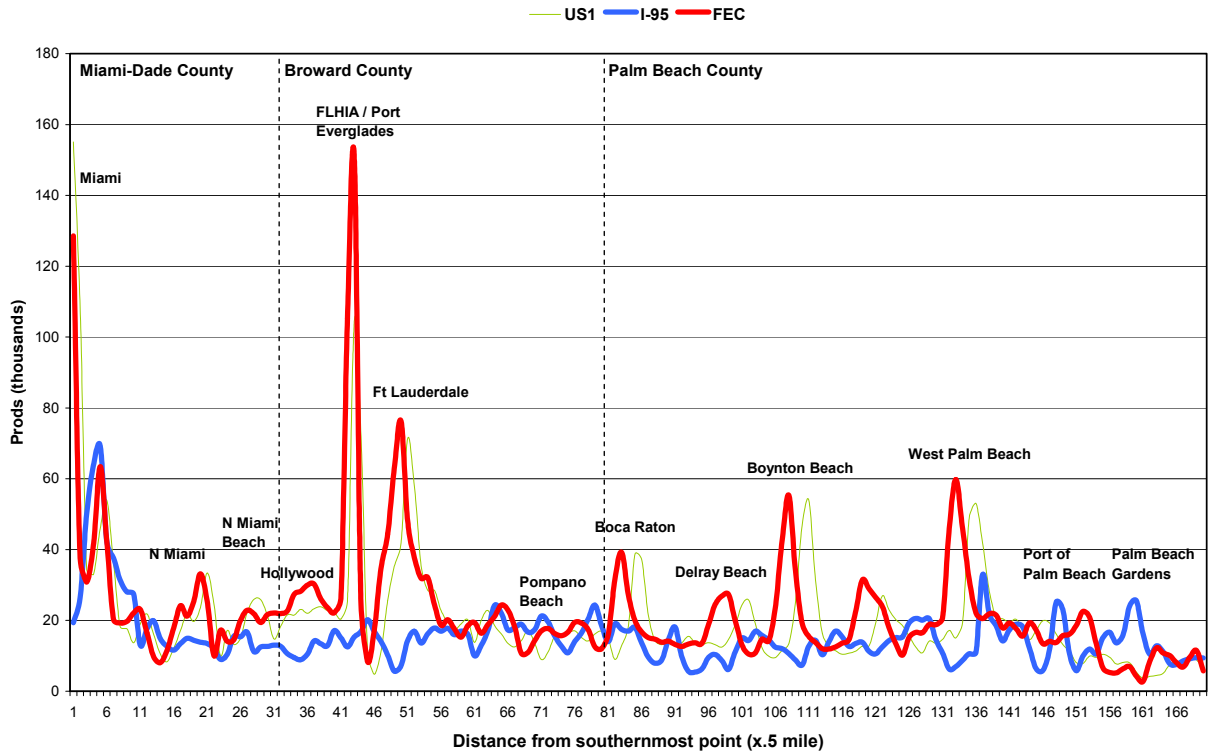


Figure 1.8: Productions within 0.5 mile of US-1, I-95, FEC



The on-board travel survey and license plate survey information validated the need for additional transit service within the SFECCTA corridor. **Figure 1.9** shows that over 20 percent of the bus riders on 10 out of the 19 routes surveyed had an origin and destination within 0.5 miles of the FEC Railway corridor meaning that they could potentially walk to a transit service along the FEC corridor for both ends of their trip. **Figure 1.10** provides detailed information regarding the on-board transit survey which indicated that over 50 percent of the bus riders on 15 out of the 19 routes surveyed had an origin or destination within 0.5 miles of the FEC Railway corridor. Individuals riding these bus routes could therefore potentially walk to a transit service along the FEC corridor at one end of their trip. The license plate survey along the north-south corridors provided information that indicated over one third of the individuals surveyed had an origin or destination within 0.5 miles of the FEC Railway corridor. Therefore, model information and survey information both confirm that there is a high demand for travel within the FEC corridor study area that could be maximized and benefited with walk up premium transit service.

Figure 1.9: Percent of Bus Riders with an Origin AND Destination

(within a Half-mile of the FEC Railway)

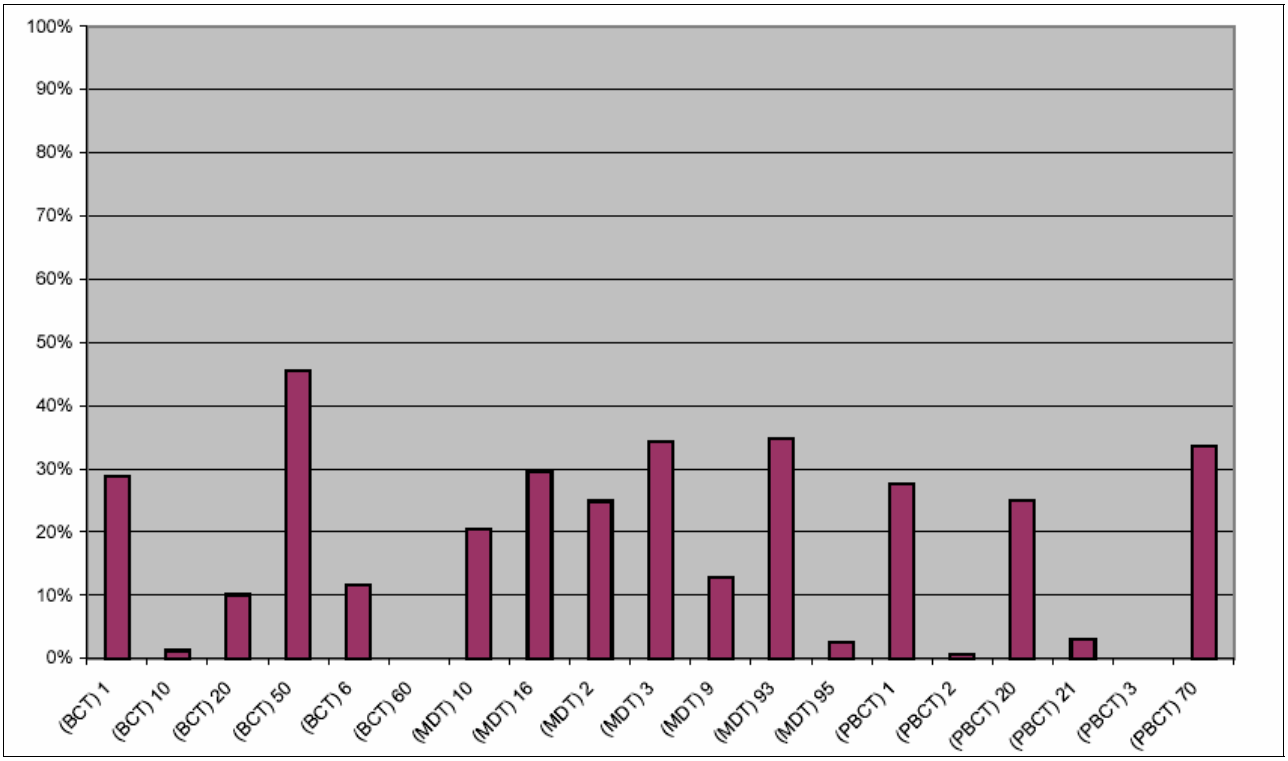
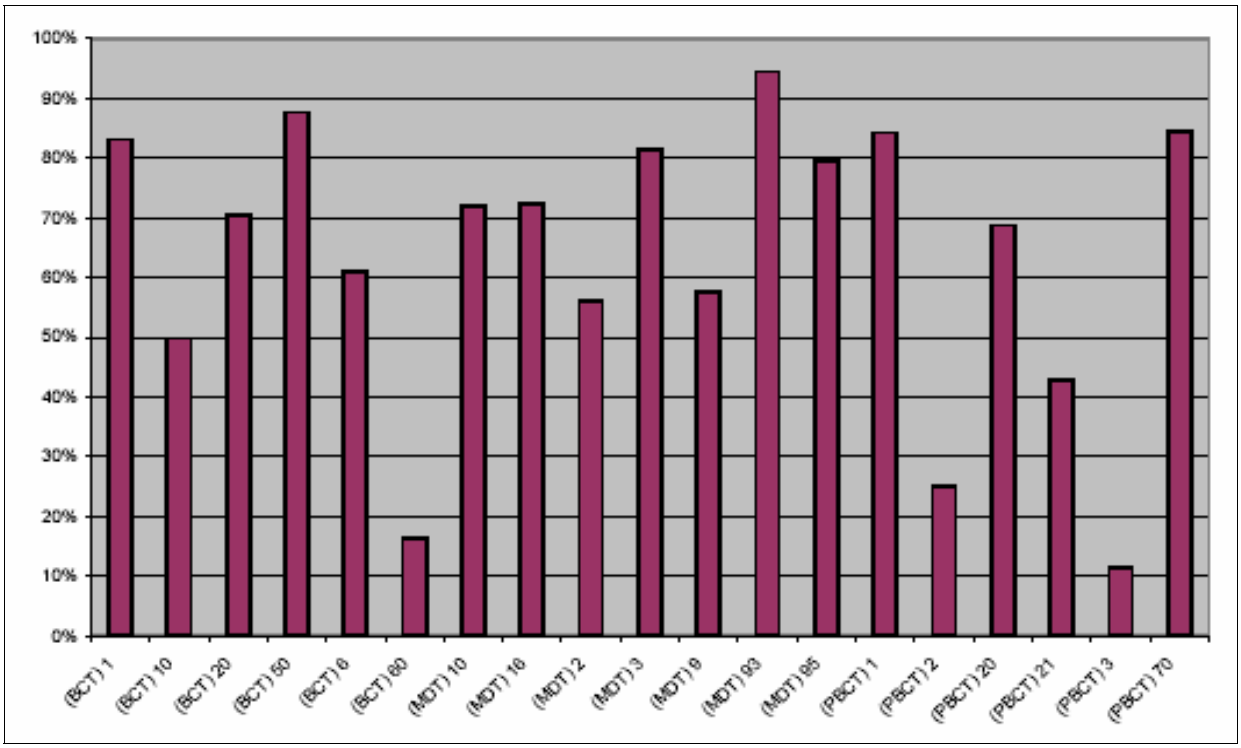


Figure 1.10: Percent of Bus Riders with an Origin OR Destination

(within a Half-mile of the FEC Railway)



The origin and destination license plate survey was also used to establish what the average trip lengths were along the corridor. As indicated in **Table 1.2**, 15 out of the 21 sites surveyed indicated an average trip length of 20 miles or less. In all instances and directions, the average trip length along north-south corridors closest to the FEC Railway (US-1 and Dixie Highway), was less than 15 miles. In comparison, a December 2004 travel survey for Tri-Rail along the SFRC indicated an average trip length of 30.4 miles, confirming the longer distance commuting patterns for that service. The Tri-Rail survey information, included in SFRTA's Transit Development Plan 2006-2010, also indicated that the heaviest peak travel flows were from Broward to Miami-Dade and Broward to Palm Beach. Therefore, a premium transit service along the SFECCTA corridor would complement the Tri-Rail service in that it would target and serve the shorter distances (10-15 miles) and average trip lengths found along the corridor. Moreover, a transit service along the SFECCTA corridor would serve the heavier travel experienced from each end of the corridor (Miami and West Palm Beach) which is currently not being served by Tri-Rail.

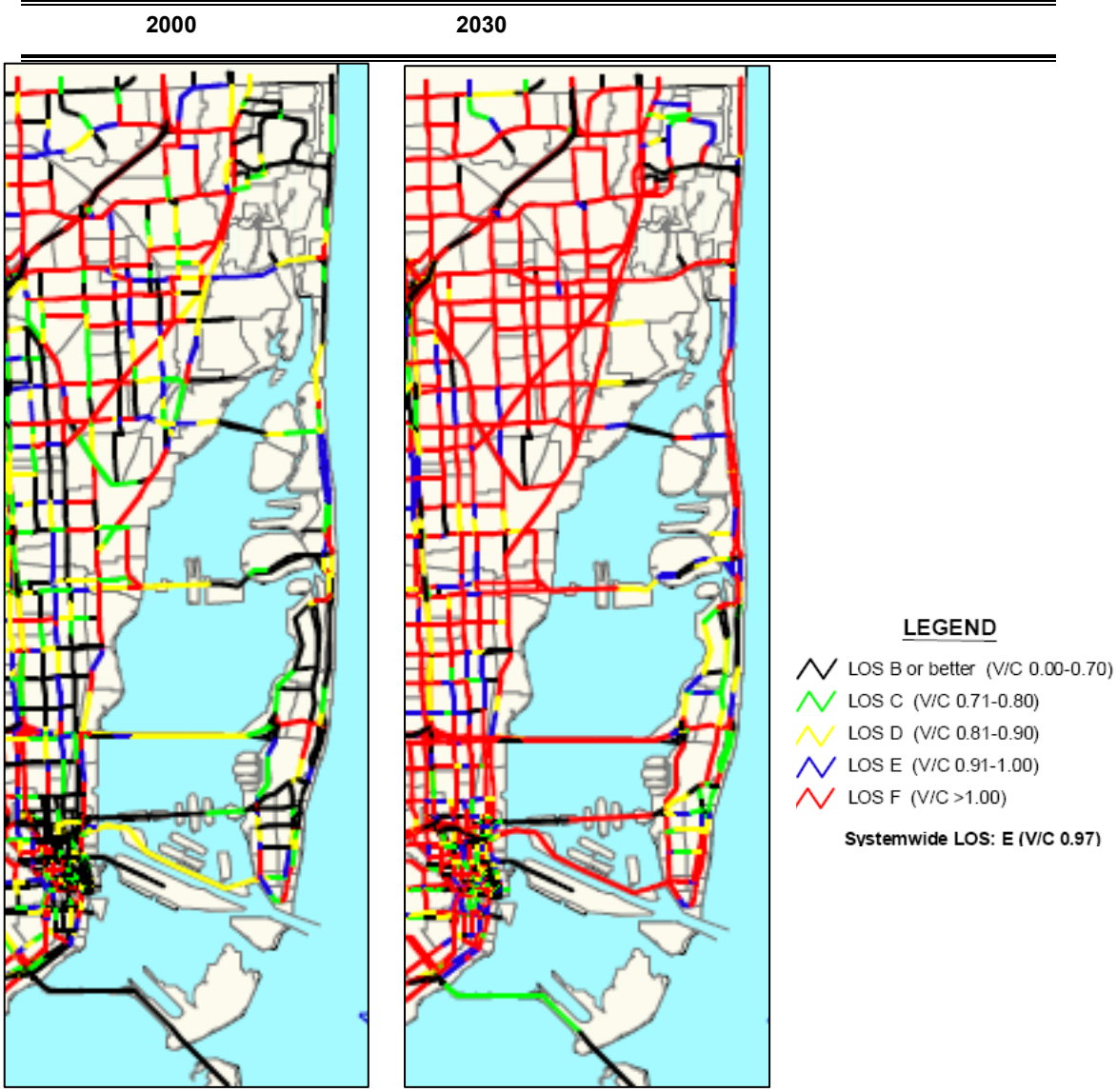
Table 1.2: Average Trip Lengths – Origin / Destination License Plate Survey

				SERPM Model*		Survey*	
County	Site	Facility	Crossroad	NB**	SB**	NB	SB
Palm Beach	1	I-95	Hood Rd.	18.4	18.7	11.4	14.3
	2	Old Dixie Hwy.	Donald Ross Rd.	17.1	14.6	10.4	12.1
	3	US-1	Donald Ross Rd.	10.3	9.7	9.9	12.1
	4	I-95	Okeechobee Rd.	21.3	21.3	17.6	18.1
	5	I-95	Woolbright Rd.	26.9	27.0	18.1	22.7
	6	US-1	Woolbright Rd.	11.6	11.2	7.0	8.9
PB/ Broward County Line	7	I-95	SW 18th St.	26.1	25.8	16.4	21.8
	8	Dixie Hwy.	SW 18th St.	12.0	12.8	9.2	8.4
	9	US-1	SE 18th St.	14.3	13.1	8.8	9.1
Broward	10	I-95	Andrews Ave. Overpass (SR-811A)	26.5	26.1	22.1	20.5
	11	Dixie Hwy.	Cypress Creek Rd./NW 62St.	12.0	11.5	8.7	9.6
	12	US-1	Cypress Creek Rd./NW 62St.	13.0	13.4	7.5	7.9
	13	I-95	Sheridan St.	23.6	24.0	18.4	20.1
	14	US-1	Sheridan St.	11.6	11.9	10.8	9.6
Broward/ M-D County Line	15	I-95	Ives Dairy Rd. (SR 584)	25.0	26.0	21.8	24.2
	16	Dixie Hwy.	NE 203 St. (SR 854)	9.7	12.0	7.6	3.1
	17	US-1	NE 196 St.	11.9	11.5	9.5	11.7
Miami-Dade (M-D)	18	I-95	NW 125 St.	23.3	23.5	22.2	19.7
	19	US-1	NE 135 St.	10.7	12.6	5.8	10.9
	20	I-95	SR 112	21.2	18.4	19.6	19.7
	21	US-1	NE 36th St.	11.5	10.1	9.4	11.1

* Trip lengths in miles **NB (northbound), SB (southbound)

The proposed project would provide an alternative to congested roadways in the study area. Roadway operations are measured in terms of Level of Service (LOS). These are measures used to determine how well the roadways are currently operating and anticipated to operate in the future given projected future growth. LOS is a qualitative measure that describes the operational conditions of traffic flow as perceived by motorists. There are six LOS ranging from A to F based on the volume to capacity (v/c) ratios for a particular roadway segment. LOS A is the best situation, representing free flowing traffic; LOS F is the worst representing total congestion, a stop and go situation as the volume approaches and even exceeds the roadway capacity. In 2005, roadway LOS for I-95 and US-1 in Miami-Dade County and Broward County ranged from D to F. Moreover, **Figure 1.11** and **Figure 1.12** indicate that LOS is going to deteriorate significantly in 2030 on all the major north-south and east-west arterials within the SFECCTA study area in Miami-Dade and Broward Counties. **Figure 1.12** depicts Broward County's existing plus committed (E+C) roadway network.

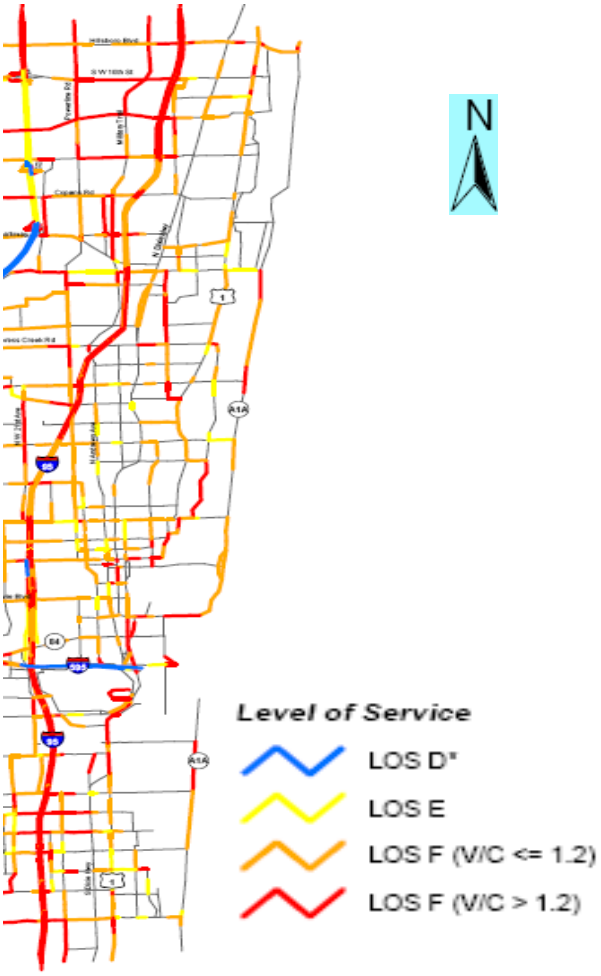
Figure 1.11: Roadway LOS in Miami-Dade County



Source: Long Range Transportation Plan (LRTP) 2030, Miami-Dade MPO

Figure 1.12: Roadway LOS in Broward County

2030 E+C Network*



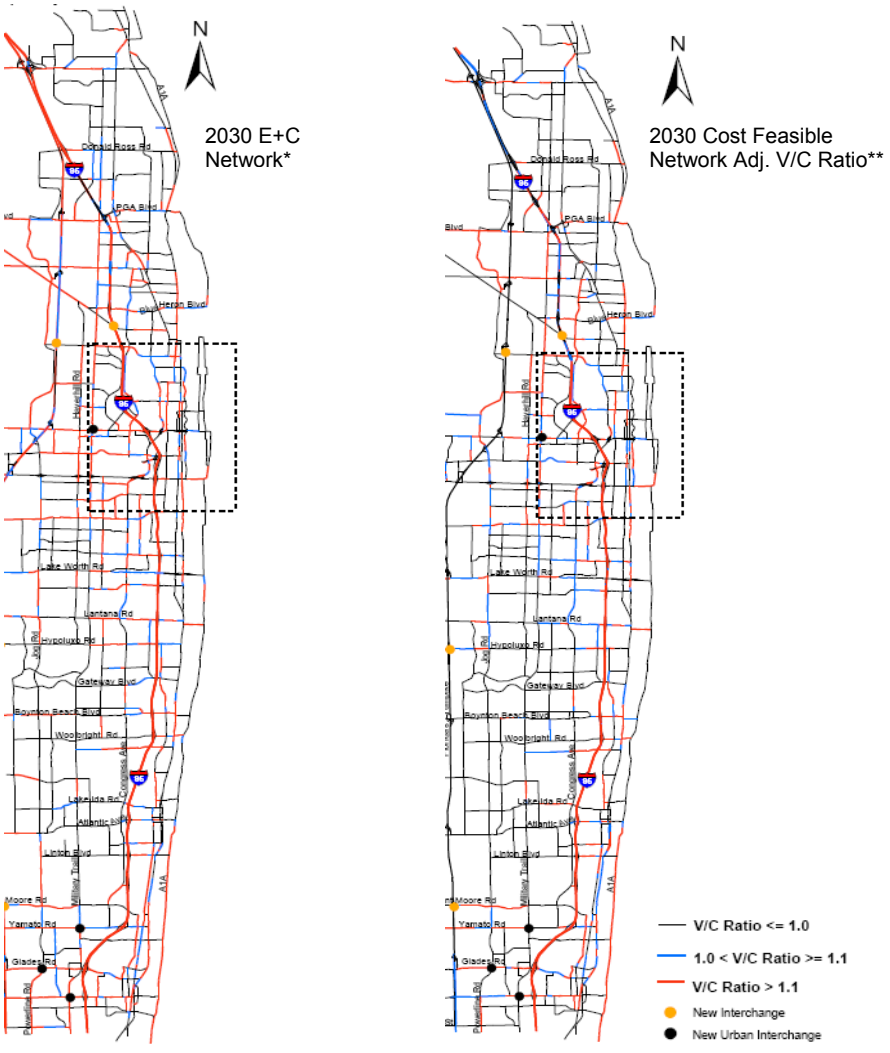
Source: LRTP 2030, Broward County MPO
*Existing plus committed roadway network

In Palm Beach County in 2002, I-95 was operating at LOS B and C, which was better than US-1 which operated at LOS C and D. However, as **Figure 1.13** indicates, LOS V/C ratios for Palm Beach County along these major north-south roadways will deteriorate in the future.

An overall assessment of the traffic conditions in the study area found that seventy percent (70 percent) of the roadways are operating at deficient levels of service in 2004 (LOS D, E or F) and thirty one percent (31 percent) are at a level of service F. This congestion continues to cause significant delay and cost productivity. For example, uncongested travel time in 2030 along I-95 from Miami-Dade County to Palm Beach County is projected at 3 hours and 6 minutes for uncongested conditions, whereas congested travel times increase to 4 hours and 12 minutes. A 2005 FDOT I-95 Managed Lanes study, completed for

Broward and Miami-Dade Counties, confirmed that the significant delays along the corridor were during the a.m. and p.m. peaks. The heaviest travel volume was along I-95 south of the Golden Glades interchange in Miami-Dade County. Congested speeds from Ives Dairy Road to I-395 in downtown Miami (a 13.5 mile distance) averaged 15 to 20 mph and travel time was 40 minutes in both the southbound a.m. peak and northbound p.m. peak. The travel time studies conducted clearly depicted great fluctuations in speeds throughout the peaks indicating stop and go conditions throughout. Although the segment of I-95 from Ives Dairy road to I-595 in Broward did not experience the same delays as in Miami-Dade, there was some significant p.m. peak delay in the southbound direction, mainly from south Broward to North Miami-Dade. Average speeds were 20 mph and travel time was 20 minutes to traverse this 8 mile section of I-95.

Figure 1.13: Roadway LOS in Palm Beach County



Source: Palm Beach County LRTP 2030
* Existing plus committed roadway network; ** Volume-to-capacity ratios – Basis for LOS

Similar to other urban communities throughout the country, there is an inability to construct new highway capacity in South Florida fast enough to keep up with travel demand. Moreover, the increasing costs associated with increasing highway capacity and the political and environmental controversy often associated with building new roads compound the mobility dilemma requiring different approaches to mobility. As an example, the study area MSA ranked 16th out of 17 large urban areas recently studied in "Freeway Lane Miles per 1,000 Capita" with a rating of 0.33 freeway lane miles per 1000 capita. This statistic indicates that the MSA in which the study area is located has relatively few lane miles of freeway compared to other large areas such as Dallas-Ft. Worth (0.829 rating), Atlanta (0.778 rating) or Los Angeles with a 0.426 rating. In order to maintain current levels of mobility, it is anticipated that the MSA would need to construct 2 to 4 times more lane miles of freeway than currently planned for by 2030. However, given the constraints previously mentioned: available land, costs, and environmental impacts, these additional lane miles would be hard pressed to materialize. Therefore, the ability to potentially provide a transit service along available right-of-way in the midst of system wide roadway congestion appears to be an attractive alternative to help serve the mobility needs of the area. Potential transit mobility options can therefore reduce the amount of delay, provide more reliable travel, reduce congestion and positively impact air quality.

Transit Demand

A transit project along the FEC corridor area would provide transit service with direct connections to where people live and want to go and meet the transit demand more efficiently.

Existing transit demand in the tri-county area is evidenced by ridership numbers along the existing systems. In Miami-Dade County, Metrorail (heavy rail) had average weekday boardings in 2005 of 58,616 and Metromover (a free Peoplemover service) had 29,072. The entire Metromover system, 6 Metrorail stations (including the most utilized at Government Center), and approximately a third of the Metrorail system is in the SFECCTA study area. Boardings for the 6 Metrorail stations are exhibited in **Table 1.3**. Opportunities exist to connect a potential passenger service along the FEC Railway to both the Metromover and Metrorail system either directly or indirectly.

Miami-Dade Metrobus has 37 routes in the SFECCTA study area and they recorded about 52 percent of the system-wide bus boardings. Furthermore, the routes running parallel to the FEC Railway in the north-south direction (14 routes) had a 26 percent share of the system-wide boardings. All the routes parallel to the FEC Railway had average weekday boardings in excess of 4,000 in FY 2005, with one exception, and ran on headways of less than 15 minutes.

Table 1.3: Metrorail Boardings

Metrorail Station	Mar-06 Daily Boardings
Tri-Rail Station	1,542
Northside	1,901
Dr. Martin Luther King	1,235
Culmer	1,108
Overtown	565
Govt. Center	11,296

Source: Miami-Dade Transit

Broward and Palm Beach Counties provide bus transit service within the study area. According to Broward County Transit (BCT) monthly ridership reports, combined daily average weekday boardings for the entire system for FY 2005 was 146,821. The 33 BCT bus routes within the SFECCTA study area contributed up to 85 percent to the system-wide ridership. Eleven (11) of the bus routes run in a north-south direction parallel to the FEC Railway and they had 42,610 combined daily average weekday boardings, which is about 29 percent of the total system-wide ridership. Average daily weekday boardings for FY 2005 for the Palm Tran system in Palm Beach County were estimated to be 27,796. The Palm Tran bus routes (26) within the SFECCTA study area comprised approximately 72 percent of the system-wide boardings. The ten (10) bus routes running generally parallel to FEC Railway in the study area recorded about 13,058 average weekday boardings (approximately 47 percent of total system-wide boardings). In addition to parallel bus routes along the corridor, there are also a total of 44 east/west bus routes that connect to the FEC. Nineteen of these routes are in Palm Beach county, fifteen are in Broward and ten in Miami-Dade county. These existing east/west routes will be the base feeder system into any transit project along the FEC.

The South Florida Regional Transportation Authority (SFRTA) operates Tri-Rail along the 72-mile SFRC that generally runs parallel to I-95, connecting Palm Beach, Broward and Miami-Dade Counties. Tri-Rail service begins at MIA Station in Miami-Dade County and terminates in Palm Beach County's Mangonia Park Station to the north. The system includes six stations in Palm Beach County, seven stations in Broward County and five stations in Miami-Dade County. With the completion of the double tracking project in March 2006, peak hour headways are reduced to 20 minutes. Key connections between the SFRC and the FEC Railway can maximize transit ridership in the South Florida area. Tri-Rail service can continue to serve the longer distance commute in its respective market, while the FEC Railway can provide the shorter distance service between the destinations further east that exhibit greater peaks in productions and attractions.

Currently, there is an extensive transfer system available to tri-county riders. For example, within Miami-Dade there is a fee for transfers between buses and from buses to Metrorail and transfers are available at northern park and ride locations to Broward destinations. Broward riders have transfer opportunities at three locations in Miami Dade County, two in Palm Beach and all Tri-Rail stations. Palm Tran provides transfers to Tri-Rail stations. **Table 1.4** depicts the three routes with the highest averages of bus ridership along US-1 and Dixie Highway in the study area. The high bus ridership indicates a clear demand for transit along the north-south corridor and the extensive transfer system (at a cost to the rider) supports the need for a continuous seamless passenger service along the FEC corridor.

Table 1.4: Highest Bus Ridership in SFECCTA Study Area

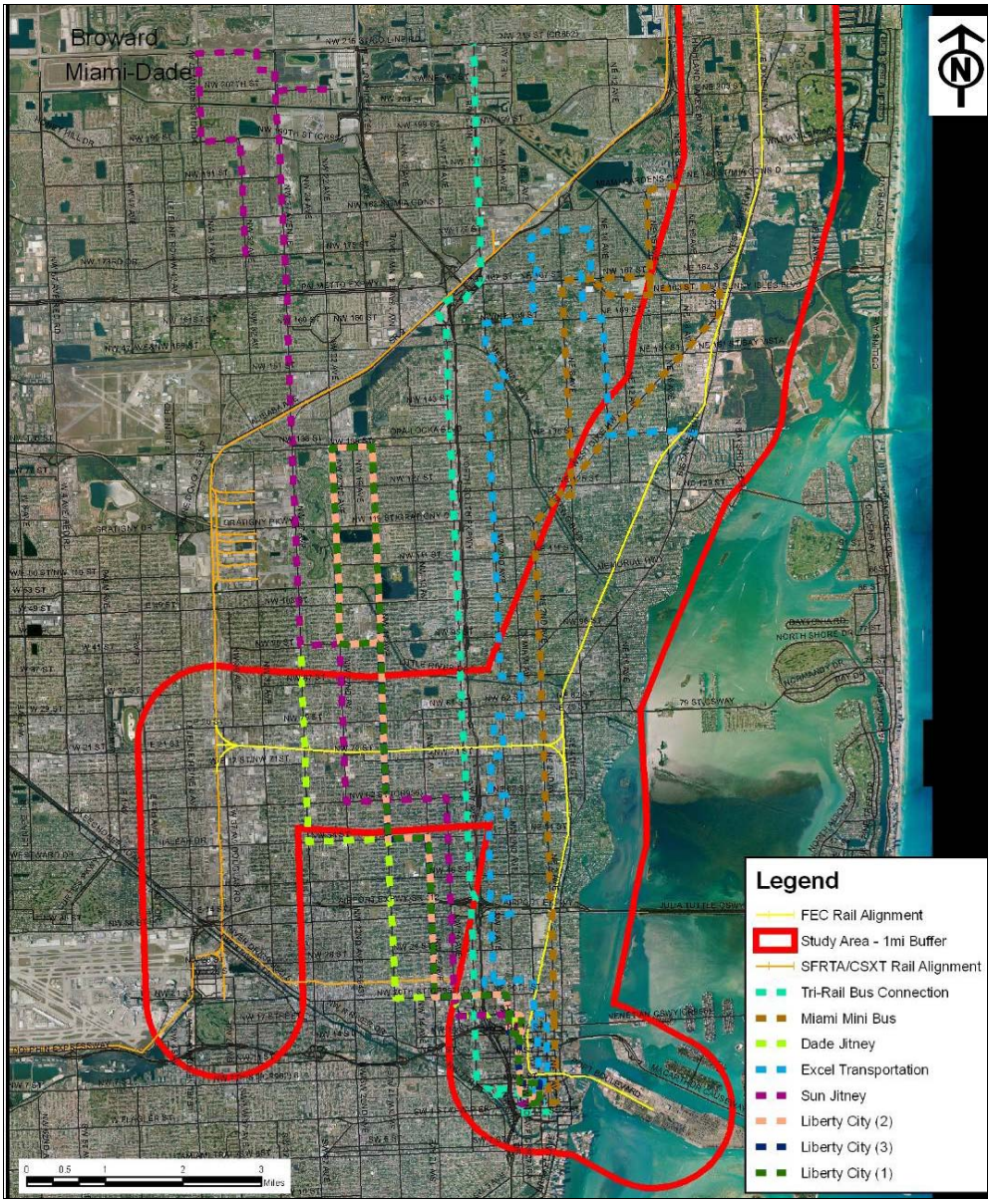
County, Date of Ridership Info	Route Covers This Roadway	Weekday Bus Ridership	Saturday Bus Ridership	Sunday Bus Ridership	Monthly Bus Ridership
Miami-Dade (Sept. 2003)					
Route 3	US-1	12,587	8,671	6,322	Not available
Route 16	US-1	12,587	2,344	1,585	Not available
Biscayne Max	US-1	2,244	Not Applicable	Not Applicable	Not Applicable
Broward (Feb. 2004)					
Route 1	US-1	8,435	5,727	3,405	208,634
Route 10	US-1	3,853	2,877	1,326	95,199
Route 50	Dixie Hwy.	5,010	2,956	1,447	119,250
Palm Beach (May 2004)					
Route 1	US-1	124,247	22,695	8,770	155,712
Route 20	US-1	6,312	986	405	7,703
Route 21	US-1	6,135	6,135	398	7,163

Source: Miami-Dade Transit, Broward County Transit, Palm Tran

Additional local transit service is provided by a total of 15 local/municipal transit circulator programs currently operating in the SFECCTA study area. These 15 local/municipal programs include 11 community bus service programs and four trolley systems. In Broward County, community buses operate in six cities (Dania Beach, Deerfield Beach, Hallandale Beach, Lighthouse Point, Oakland Park, Pompano Beach) and in Miami-Dade County they operate in five cities/villages (Hialeah, Biscayne Park, North Miami, North Miami Beach and Aventura). Four trolley systems are in operation in the study area: three in Palm Beach County (Boynton Beach, Lake Worth and Downtown West Palm Beach) and one in Broward County (Fort Lauderdale). Some of the existing trolley services are operated by public-private partnerships. Another example of transit service available in the study area includes private jitneys that

operate in the Miami CBD (**Figure1.14**). This service consists of private vans that operate on a semi-fixed route with flexible schedules and 3 minute headways.

Figure 1.14: Jitney Routes in Miami-Dade County

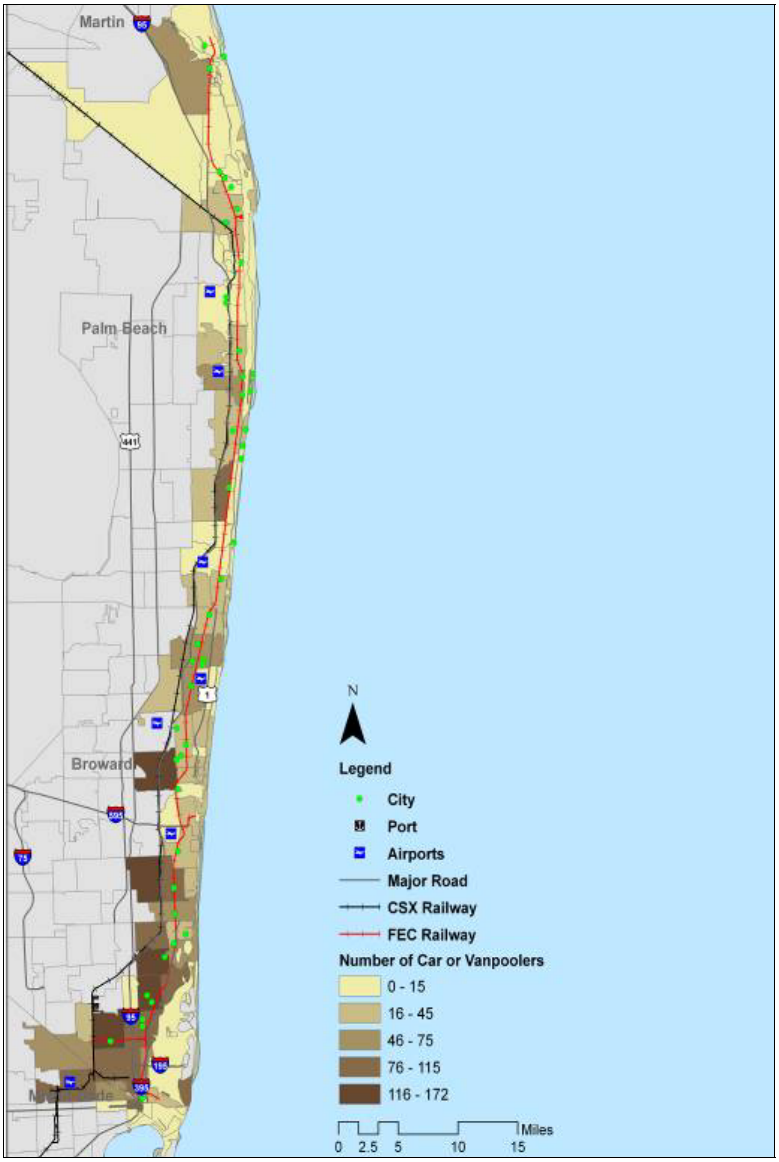


Other transit available in the SFECCTA study area includes the National Railroad Passenger Corporation (Amtrak) which provides intercity and long-distance services in Florida. Two routes operate within the SFECCTA study area and run along the SFRC. There are six Amtrak stations in the study area, one in Miami-Dade County, three in Broward County and two in Palm Beach County. Within Florida, Amtrak ridership increased by 3.4 percent from 2003 to 2004. Miami and West Palm Beach stations within the SFECCTA study area had over 50,000 passengers in 2004. Fort Lauderdale and Hollywood stations added more than 4,000 passengers from the previous year. Proposed transit connections between the

FEC corridor and the SFRC can assure that intercity passenger service along the FEC would not be precluded in the future.

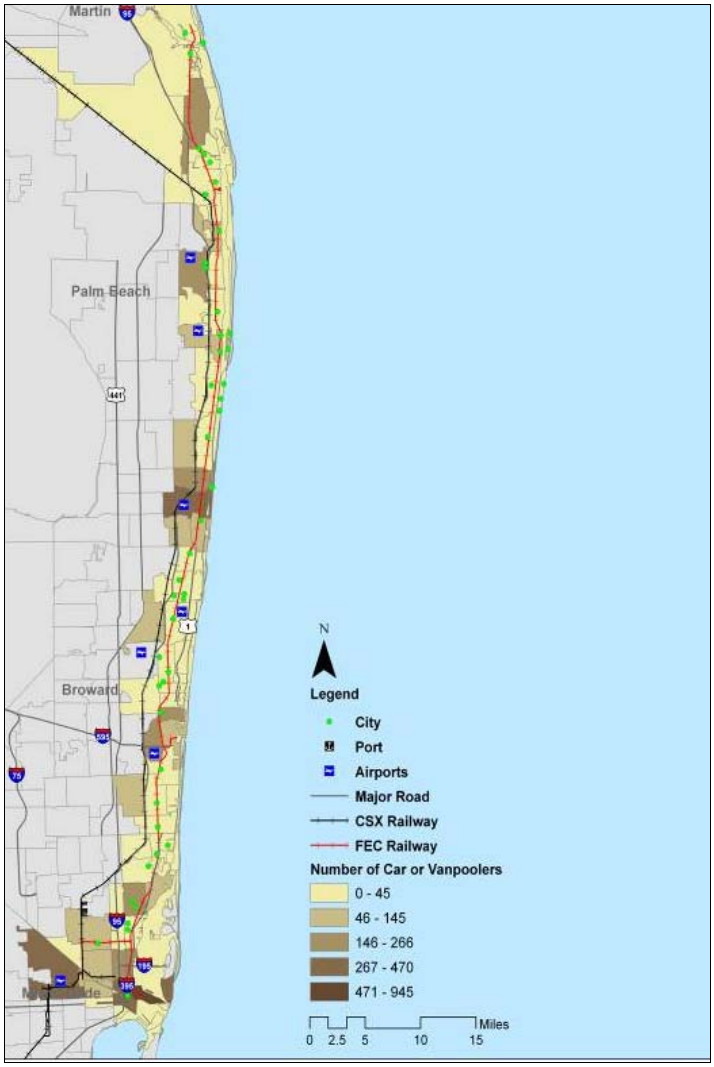
Another indication of transit demand within the study area is the number of existing carpoolers and vanpoolers whose origins and destinations are in the study area. Information from South Florida Commuter Services noted that there are 3,386 carpoolers and 118 vanpoolers in their database who reside in zip codes encompassing the study area. Additionally, there are 7,483 registered carpoolers and 447 registered vanpoolers in their database who work in zip codes within the study area. It is also probable that there are additional vanpools operating within the study area that are not registered. A summary of the carpool and vanpool origins and destinations is included in **Figure 1.15** and **Figure 1.16**.

Figure 1.15: Car and Vanpool Origination



Source: South Florida Commuter Services

Figure 1.16: Car and Vanpool Destination



Source: South Florida Commuter Services

Although the amount of existing transit appears to be significant in the study area, it may also indicate redundancy and overlap of existing bus routes/service which can create additional congestion and inefficiencies. A proposed continuous transit service along the SFECCTA corridor has the potential to eliminate overlap in bus service and create efficiencies in transit service by providing key connections to the existing local transit system. Potential elimination of redundancy in street transit service would benefit overall air quality and reduce congestion.

Land Use Demand

The proposed project will provide access to the highest population and employment densities in the region.

The study area presents a unique combination of high population and employment densities. The study area houses 17 percent of the population of the tri-county region and one in every four persons (27 percent) in the region are employed in the study area **(Table 1.5)**. This trend is projected to continue in the future. As indicated in **Figure 1.17**, the population density is especially high in and around the City of Miami CBD and in Broward County. Due to limited availability of land, population densities are anticipated to significantly increase throughout the study area. The study area also encompasses major employment centers such as the airports, seaports, and major tourist destinations **(Figure 1.18)**. As an example, in Miami-Dade County, 6 out of the top 10 largest public employers have offices or facilities located in the study area. Data from the Greater Miami Convention and Visitors Bureau (GMCVB) indicates that over 3,000 visitors come to the Miami downtown area daily as a result of the attractions in the area. These employment and activity centers are regional in nature and would be supportive of a regional transit system. **Table 1.6** highlights densities in the study area by County. Population and employment densities (and associated productions/attractions) are highest in Miami-Dade County in relation to the other counties and the average tri-county area numbers. The Palm Beach County densities are across the board lower than the other counties and average tri-county area.

Table 1.5: Demographic Information

	2000			2030		
	Population	Households	Employment	Population	Households	Employment
Study Area	843,844	347,033	645,528	1,278,748	510,640	884,653
Tri-County	4,904,846	1,902,561	2,340,249	7,299,525	2,724,039	3,314,867
Study Area as % of Tri-County Area	17.2	18.2	27.6	17.5	18.7	26.7

Source: Census 2000, SERPM Model Data

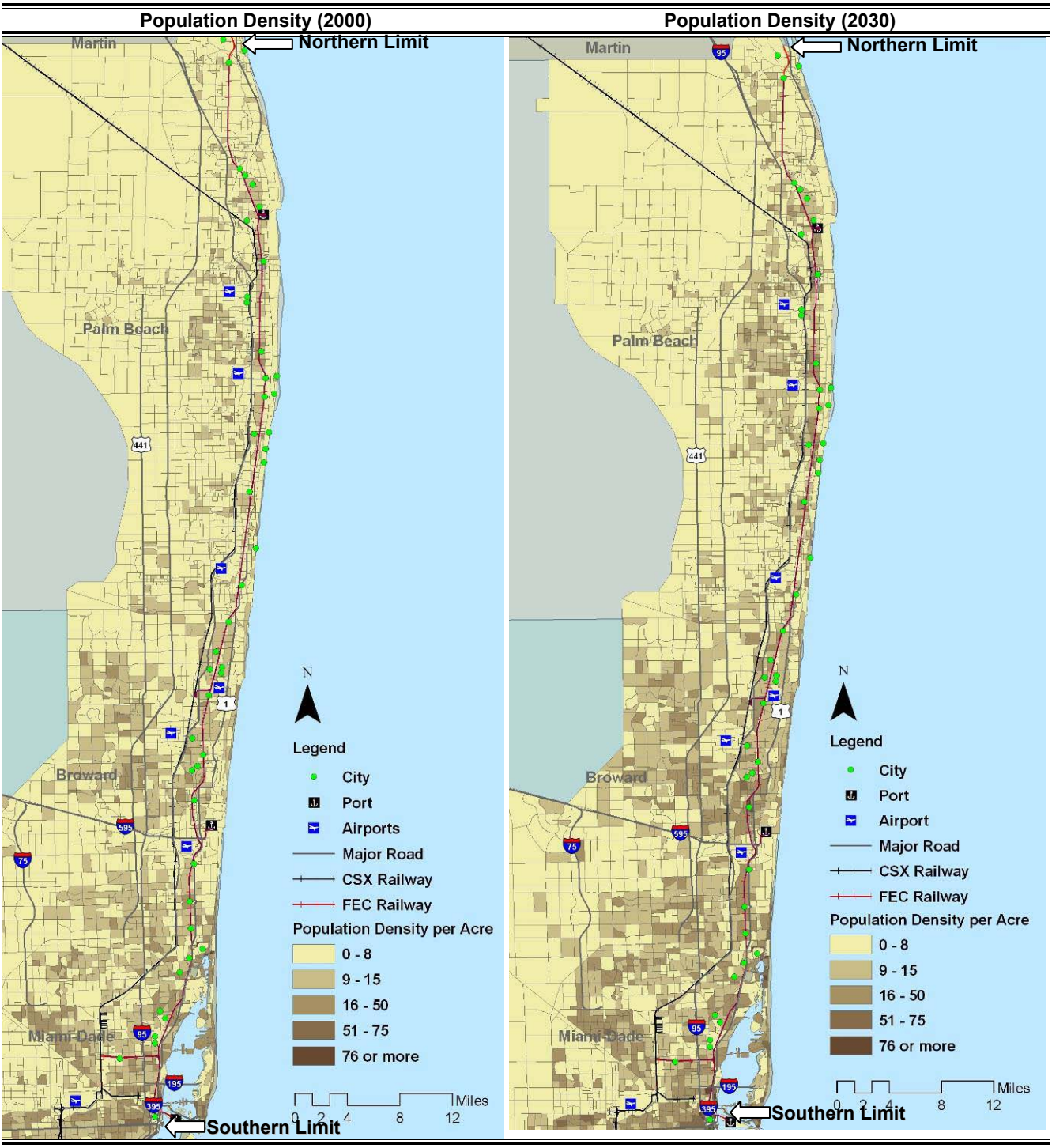
Table 1.6: Densities (per acre) in the Study and Tri-County Area

	2000			2030				
	Pop	HHs	Emp	Pop	HHs	Emp	Prod	Att
Study Area– Miami-Dade	11	4	9	14	5	12	43	59
Miami-Dade	5	2	3	8	3	4	23	22
Study Area – Broward	7	3	5	12	5	6	43	47
Broward	6	2	2	9	3	3	27	28
Study Area – Palm Beach	5	2	3	8	3	5	29	39
Palm Beach	2	1	1	4	2	2	13	13
Tri-County Area	4	2	2	6	2	3	20	20

Source: Census 2000, SERPM Model Data
Abbreviations: Pop – Population; HHs – Households; Emp – Employment, Prod – Trip Productions; Att – Trip Attractions

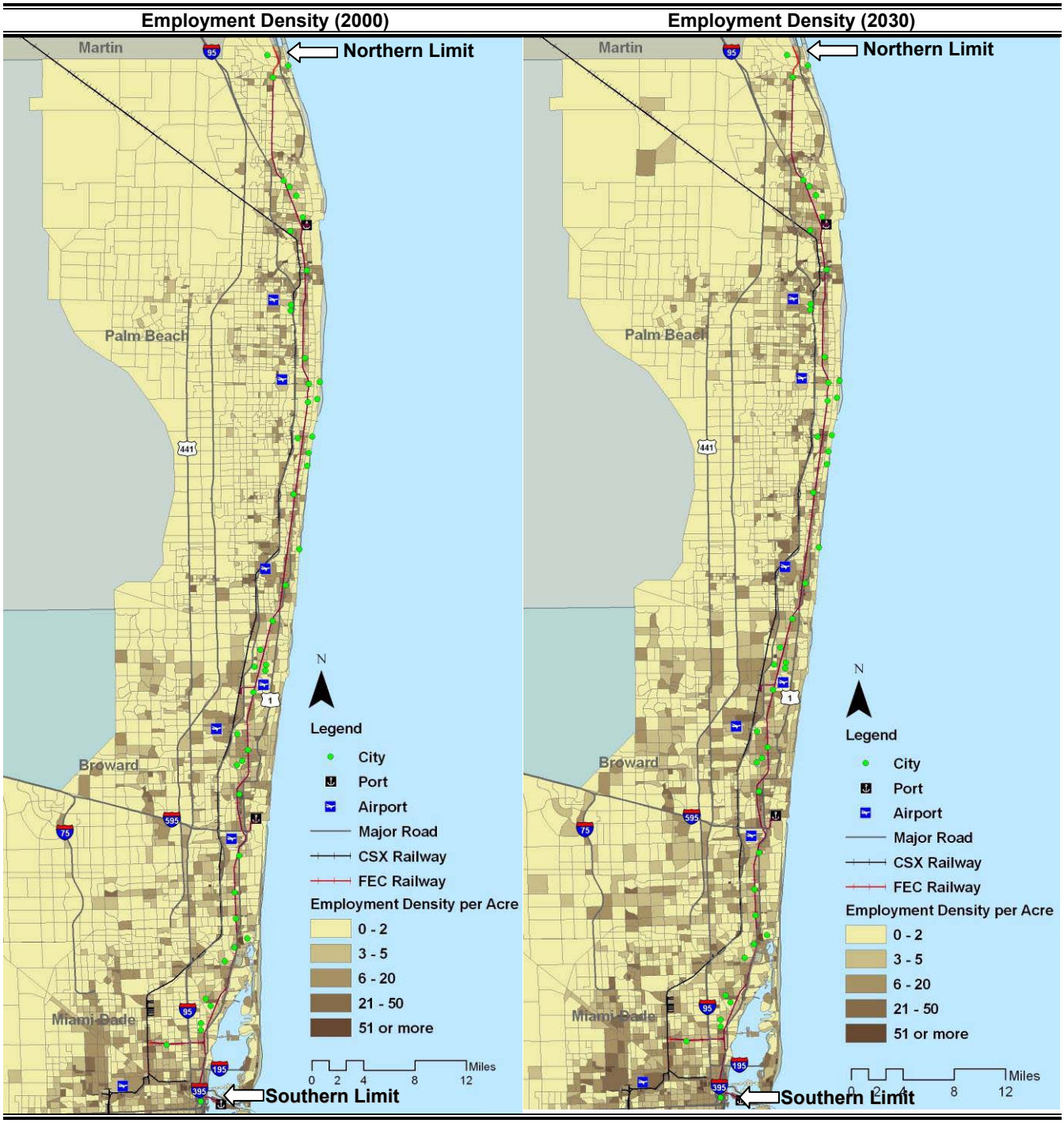
The number of trip productions and attractions associated with demographic indicators clearly indicate that the study area growth is double the tri-county area numbers.

Figure 1.17: Population Density for 2000 and 2030



Source: Census 2000, SERPM Model Data

Figure 1.18: Employment Density for 2000 and 2030



Source: Census 2000, SERPM Model Data

Rail Freight Demand

A proposed improvement along the FEC corridor area would support the safe and efficient movement of freight to and from the South Florida area which is important to the overall economic and environmental health of the region. Rail freight moves building materials, consumer goods, and other commodities into the region. Rail freight is also a key supporting link for South Florida's dominance as the maritime gateway between the United States and Caribbean/Latin American region.

Overall the FEC operates a freight only rail operation focusing on four principal markets in South Florida:

- the movement of intermodal containers and trailers to serve local markets or through movement to/from ports in South Florida,
- the movement of rock and stone used for construction from quarries in Miami-Dade County to concrete plants and construction depots along the east coast of the state,
- the delivery of automobiles for local use or export to southern destinations, and
- the provision of carload freight service to a limited number of local customer warehousing facilities along the line.

FEC's customer base in South Florida includes three intermodal operations, three industrial warehousing districts, 26 local online customers or team tracks and four locations for the potential interchange of traffic with CSXT operations on the SFRC. The intermodal operations include a major facility at Hialeah used for the local use and POM traffic, a ramp at Fort Lauderdale for local use and the service of PEV traffic and the PPB which serves overseas traffic. The three industrial warehousing districts include the vicinity of Hialeah, the Pompano Market north of Fort Lauderdale and the Lewis Terminal district in the vicinity of West Palm Beach. The 26 local online customers and team tracks included 14 locations which were observed to be actively engaged in the shipment of building materials (10), food products (3), and paper (1). The remaining 12 sites were observed and reported to be inactive at the time of train inspection trip. In 2005 the FEC carried 550,000 carloads of traffic. Forecasts indicate that traffic could increase by approximately 56,000 to 86,000 carloads in the next decade, representing a 10 to 16 percent traffic increase. With such a growth in traffic it is likely that FEC could add several trains to their current average lineup of 26 daily trains. The average train length ranges from 4,500 feet to 8,500 feet.

CSXT operates freight rail services along the SFRC focusing on three principal markets in South Florida:

- the movement of rock and stone used for construction from quarries in Miami-Dade County to concrete plants and construction depots within the state,

- the provision of carload freight service to local customer warehousing facilities along the line, and
- the movement of occasional unit trains (e.g. steel or coal) on an as-required basis.

CSXT moves virtually no containers and trailers on intermodal trains in South Florida. Most of the intermodal traffic in the region moves on the parallel FEC rail corridor. In 2004 the CSXT carried 14.9 million gross tons of train equipment and lading on the SFRC. The observed road trains on the SFRC provides capacity for about 600 cars per day, which would suggest 20 percent of the cars are moving on local trains. This is consistent with the observation that many more local trains and freight cars in sidings were observed on the SFRC compared to the FEC. In total, CSXT runs 4 weekday road freight trains and 2 local trains. CSXT maintains three principal yards in the study area, Hialeah (in Miami), Dania (near Fort Lauderdale) and Pompano Beach. Each yard has local trains which serve online customers with carloads of various commodities. Over the past ten years, freight traffic increased by over 50 percent. With the completion of the double tracking project it is anticipated that CSXT has sufficient capacity to meet future needs. These needs will be better coordinated with Tri-Rail operations on the SFRC due to the imminent transfer of dispatching control along the SFRC to the SFRTA. Any potential Tri-Rail extension north or south will also have to be coordinated with CSXT operations along the SFRC. Additionally, a freight integration analysis as part of this study highlights the potential for connections between the two freight corridors, thereby, maximizing the potential for more efficient freight and passenger movements in the study area.

Seaport Demand

A proposed transportation improvement along the FEC corridor area would support demand at major area seaports.

The POM is the largest truck generator in Miami-Dade County (4,000 trips per day) followed by MIA (over 1,100 trips per day) and existing FEC/CSXT rail yards (1000 trips per day to FEC Railway Hialeah yard). PEV in Ft. Lauderdale has similar truck generations values. Container movement information indicates that the POM leads the state with 1,041,483 twenty-foot equivalent units (TEU's) in fiscal year 2003, followed by PEV with 569,743 TEU's (number three in the state) and the PPB with 217,558 TEU's (number four in the state). Cruise ship activities in the same period (2003) for the POM were over 3.9 million passengers, PEV with over 3.3 million passengers and the PPB with 650,000 passengers. Traffic at the POM is constrained from growing in the future due to lack of land availability. Therefore, no more than 10 percent of the intermodal traffic through the POM moves by rail. However, truck access to the POM is poor due to continued growth in the City of Miami CBD. A potential rail freight solution along the FEC to the POM would alleviate truck traffic to the port and conflicts with increased vehicle congestion in the CBD.

PEV is currently served with three intermodal trains per day on the FEC. PEV anticipates building an "on dock" terminal which would facilitate the movement of freight to its port. Should this happen, port traffic along the FEC could grow more rapidly and potentially overtake the POM in container volume. The PPB is currently served by one intermodal train a day on the FEC. The PPB is also reconfiguring its rail yard to better enable it to handle large volumes of rail traffic so that future growth is also expected here.

The potential to maximize the use of the FEC right-of-way for passenger and freight service is therefore attractive not only for the movement of people but also goods. The use of rail freight to serve seaport demand would also have the positive benefit of decreasing the number of trucks along roadways, thereby, increasing the safety of traveling motorists and reducing congestion.

Airport Demand

A proposed transit project along the SFECCTA corridor area would facilitate movement of people to major airports in the area.

MIA ranks as the number one airport in the country for international freight and number three in the world for international passengers processed. In 2004, MIA ranked 15th in the country (31 million passengers) while FLL ranked 24th with over 20 million passengers processed. More significantly, FLL had one of the fastest growth rates in the country, with a 16 percent increase in passenger traffic from 2003 while MIA had a 3 percent growth. Limited information from PBIA indicated that they are processing over 7 million passengers a year. To accommodate continued growth at these three major activity centers, improvements to terminals and runways are currently under construction at MIA and FLL.

Therefore, expanded passenger and freight capacity along a major SIS facility, such as the FEC, would be beneficial to meet the continued overall demand experienced at the major airports in the study area. Moreover, potential direct connections between these three facilities would provide opportunities for efficiencies in the processing of freight and passengers, particularly in the event of emergency evacuations.

System Linkage

- Problem: The two continuous major north-south roadways serving the eastern communities of South Florida, US-1 and I-95, are currently congested and are anticipated to be increasingly congested in 2030. Moreover, of the major State roadways examined throughout the study area, over 70 percent were found to be operating above their capacity. Therefore, given the constraints in terms of land values/availability and costs of roadway construction, the provision of additional roadway capacity (additional lane miles) in the study area is anticipated to continue to lag behind the area growth rates.

- Problem: The FEC corridor and the SFRC traverse the study area serving freight needs. Freight needs are anticipated to grow along both corridors.

- Problem: Continuous north-south transit ridership opportunities are limited to Tri-Rail along the SFRC which currently does not provide a direct link to the major employment and population centers of the area.

Need: An additional transit service link is needed to provide greater mobility to directly access jobs, transportation hubs, varied housing opportunities, recreation, schools and health facilities. A link is needed between the existing passenger/freight service along the SFRC and the FEC corridor area to provide increased transit and freight mobility as an alternative to moving people and goods on congested roadways.

- Proposed Action- A transit project along the FEC Railway corridor area:

  - Would link the eastern cities CBD's, which originally developed along the FEC.

  - Would link key major employment centers, two State universities: Florida International University (FIU) and Florida Atlantic University (FAU), the Palm Beach Atlantic University (PBAU), and various community colleges.

  - Would serve and expand overall transit ridership in the area with direct connections to existing and proposed transit. In Miami-Dade County these connections would be to Metrorail (a regional heavy rail system), Metromover (a Peoplemover system) and Metrobus. Metrorail stations in the Miami CBD would interface directly or indirectly with the FEC corridor. Bus ridership in Miami-Dade, Broward and Palm Beach within the study area constituted 52 percent, 85 percent and 72 percent of the respective system-wide boardings for each county indicating not only a need for additional transit but also the potential to extend the mobility options throughout the study area by providing a continuous tri-county transit connection.

  - Would link with existing and planned local systems such as trolleys in Boynton Beach, Lake Worth, downtown West Palm Beach, Miami Beach, Miami and Ft. Lauderdale; with existing and planned waterborne transit, and with planned premium (fixed) transit systems such as the Central Broward East-West and the Miami-Dade East-West corridor to the MIC.

  - Would link with passenger and freight service along the SFRC (CSXT).

  - Would provide opportunities to provide needed freight capacity expansion for the area. Significant opportunities exist for connections between the SFRC and the FEC corridor to not only maximize the movement of goods but also people. These potential connections would contribute to the

expansion of a true multi-modal transportation network in the South Florida area by maximizing the use of two key SIS corridors that serve three airports and three seaports and move people and goods.

- Would provide an alternative travel mode for tourist destinations.

Therefore, combined freight and passenger service along the FEC corridor would provide key linkages to the existing road network and provide additional capacity to expand the transportation system coverage which is needed to serve the high population and employment density areas along the coast, the major seaports, airports and other significant land uses along the corridor. The proposed project would also more closely link major SIS facilities, thereby maximizing their multi-modal interaction.

1.2.2. Federal, State, or Local Government Authority

- Problem: State and local governments have identified a need along the eastern coast of the tri-county area for additional transit mobility improvements.

Need: A proposed transit project is needed in the tri-county area to enhance mobility.

- *Proposed Action* – A transit project along the FEC Railway corridor area:

  - Would be consistent with the Miami-Dade MPO 2030 LRTP, which identified the Northeast Corridor project along the FEC for premium transit service. This project is listed as a cost-feasible, Priority IV (2021-2030) project in the 2030 Plan. It is a 13.6 mile rapid transit corridor from Downtown Miami to the Broward County Line (NE 215th Street) along Biscayne Boulevard and the FEC Railway right-of-way. The purpose of this project is to serve the high densities and population concentrations along the eastern seaboard, provide a regional link to Broward County, and to provide service to multiple municipalities and neighborhoods.

  - Would be consistent with the Broward County MPO LRTP Year 2030 Update (adopted December 2004) which identified Light Rail Transit and crossing improvements on the FEC corridor from Miami-Dade County to Palm Beach County as a cost feasible project.

  - Would be consistent with the 2030 Palm Beach County LRTP which also includes the expansion of Tri-Rail service along the FEC tracks to the northern county border.

Overall local support for transit expansion within the study area is evident with the adoption of Miami-Dade County's People's Transportation Plan (PTP) and half-penny transportation surtax which paved the way for a dedicated funding source exclusively for the improvement of transportation. A similar vote is scheduled to occur in Broward County as early as November, 2006 which is anticipated to generate an

estimated $260 million a year for transit projects. Both plans include potential funding of passenger service along the FEC. Transit expansion along the FEC corridor is also consistent with each of the Counties' local government comprehensive plans. The Florida Department of Community Affairs (DCA) reviewed the Evaluation and Appraisal Reports (EARs) on the Comprehensive Plans for each County and found them in compliance with the provisions of Chapter 163, Florida Statutes. Similarly, the DCA reviewed the tentative Work Programs of Districts 4 and 6 which contain projects along the SFECCTA corridor, and found those Programs in compliance with Chapter 339.135(4)(f), Florida Statutes. The FEC Railway has also been identified as part of Florida's SIS. The Florida Legislature established Florida's SIS in order to accommodate future growth in Florida. The SIS is composed of transportation facilities, such as the FEC Railway and its freight terminals, and services of statewide and interregional significance.

1.2.3. Social Demands and Economic Development

- Problem: Access to jobs and other activities for a disproportionate number of transit-dependent populations is limited due to a lack of an easily accessible continuous transit facility.

Need: A transit improvement is needed where transit-dependent populations are located to facilitate access to jobs and other activities.

- Proposed Action – A transit project along the FEC corridor area:
  - Would provide access to jobs (the main employment centers are in the study area) and additional housing opportunities in transit-dependent areas by supporting redevelopment efforts of under-utilized areas adjacent to the FEC corridor.

The FEC study area has a considerable concentration of transit-dependent populations (**Figure 1.19** and **Figure 1.20**). Low-income, ethnic minority, 0-car households, and youth and elderly are considered transit-dependent groups as these groups typically rely on transit services for access to jobs, services and amenities. The study area has a significantly high number of households with annual incomes less than $15,000 concentrated mostly in Miami-Dade and Broward Counties. Noticeably, Miami-Dade County also has high concentration of 0-car, and elderly and youth populations (**Figure 1.19**). In Palm Beach County, especially near the PPB, there are also a high number of 0-car households.

Table 1.7 summarizes information on transit-dependent populations within the study area and the tri-county area. Information represented for the tri-county area is an average of the three counties. **Table 1.8** summarizes transit-dependent density information by county. Transit-dependent densities in the study area are higher than the tri-county area, are highest in Miami-Dade and lowest in Palm Beach, and for

each respective county the number of transit-dependent populations in the study area are higher than the county as a whole.

Table 1.7: Transit-dependent Population

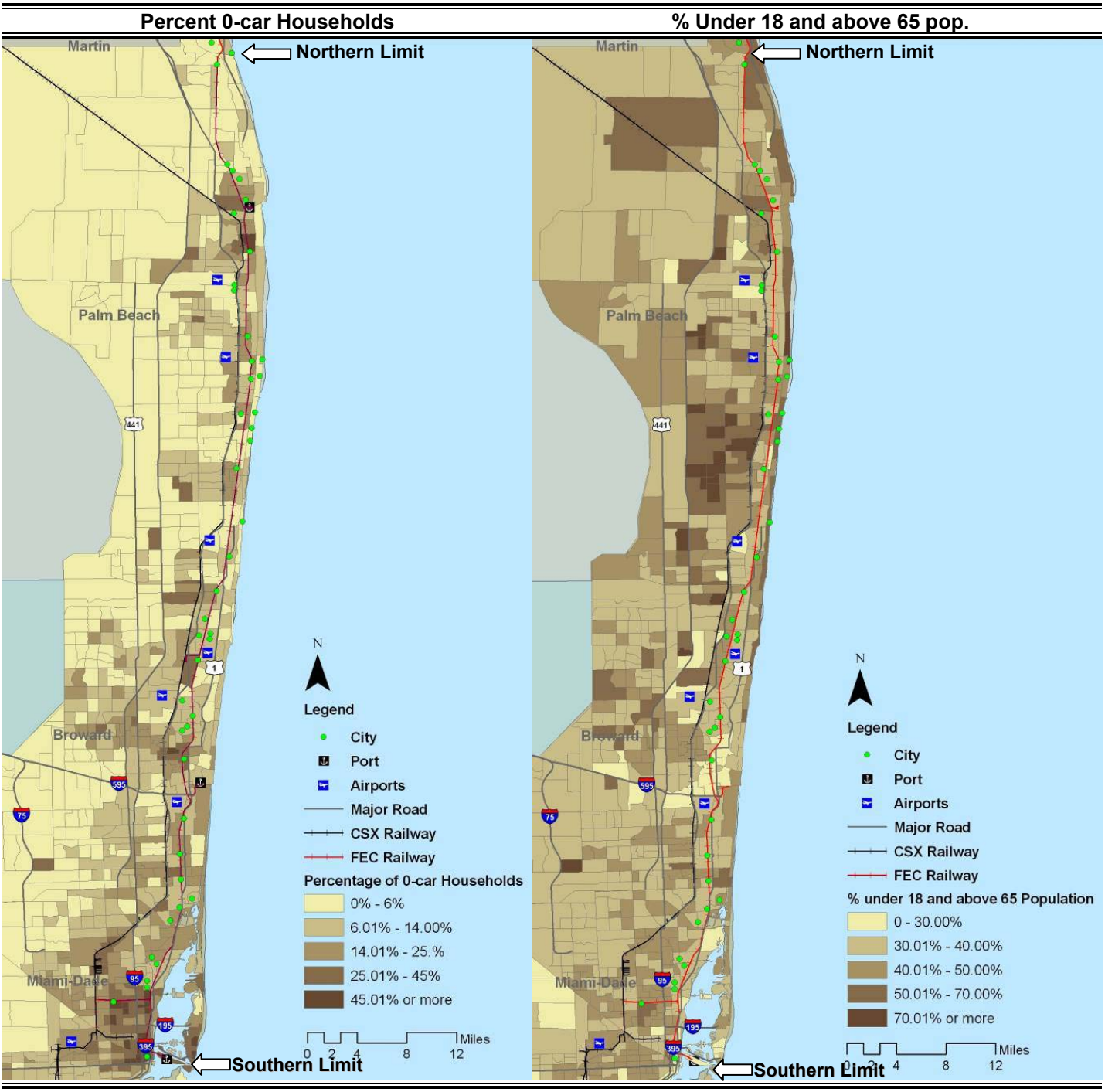
Population group	Study Area		Tri-County	
	No.	% of total	No.	% of total
Minority HH	78,188	22.5	446,532	23.3
Low-income HH	105,240	30.3	455,461	23.9
0-car HH	53,085	15.3	209,389	23.0
Elderly and Youth	328,518	38.7	1,998,330	40.0

Table 1.8: Transit-dependent Densities (per acre)

Study Area Segment / County	0-15K (HH) den	0-car (HH) den	Minority (HH) den	<15 or 65 > (No.) den
Study Area - Miami-Dade	1.6	0.9	1.1	4.2
Miami-Dade	0.6	0.3	0.6	2.1
Study Area -Broward	1.0	0.4	0.7	2.7
Broward	0.5	0.2	0.5	2.4
Study Area - Palm Beach	0.5	0.2	0.4	2.1
Palm Beach	0.2	0.1	0.2	1.1
Study Area-Tri-county	0.9	0.2	0.6	2.7
Tri-county	0.4	0.1	0.4	1.8

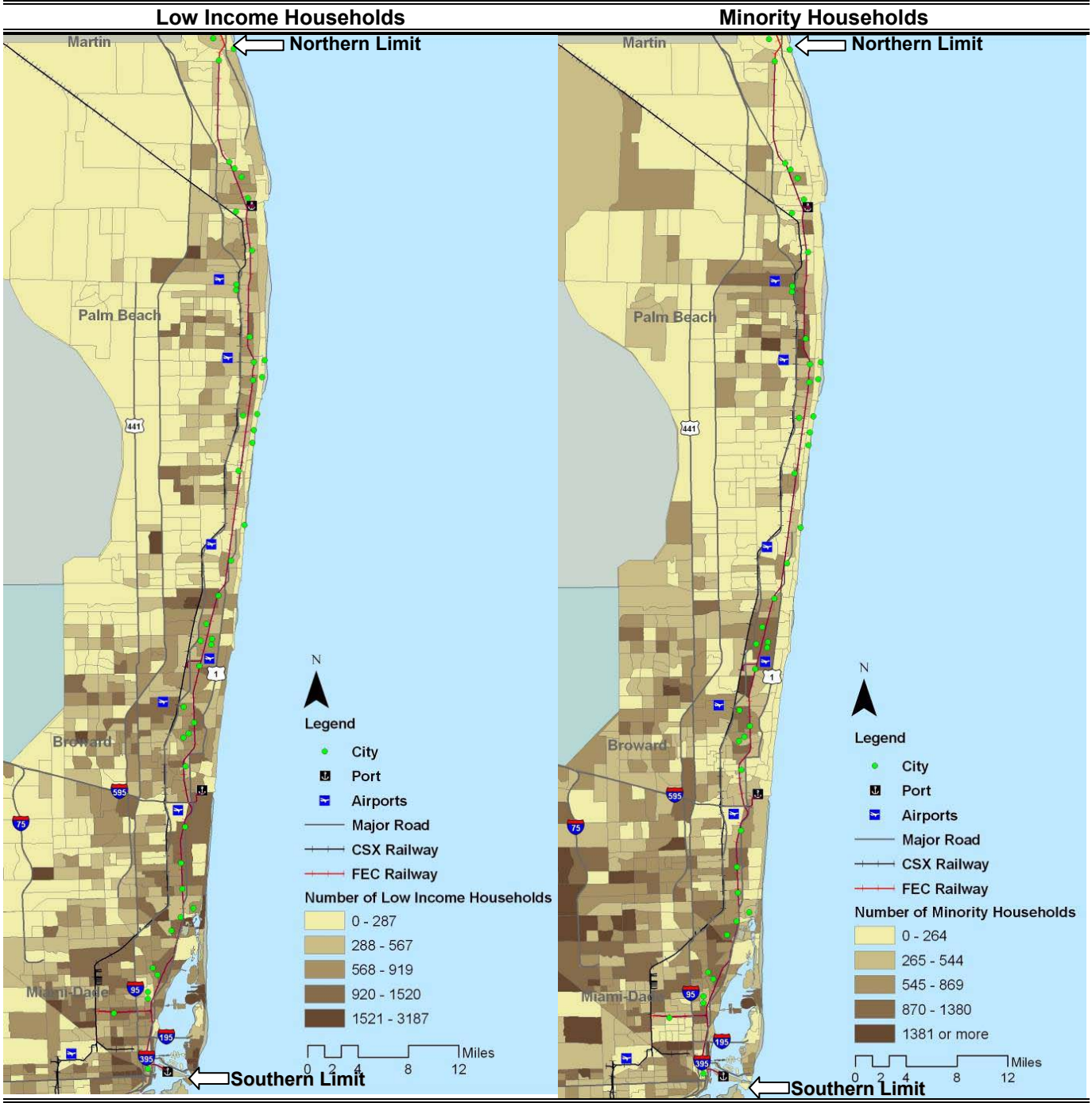
Figure 1.21 and **Figure 1.22** depict that along the FEC and I-95, the highest peaks of low-income populations and 0-car households are close to the Miami and West Palm Beach CBD's. A significant amount of the 0-car households are more discernable along the I-95 corridor, thereby making walk up transit opportunities more important along this corridor. However, as mentioned previously, walk up opportunities along the SFRC are very limited.

Figure 1.19: Transit-dependent Population



Source: Census 2000

Figure 1.20: Transit-dependent Population



Source: Census 2000

Figure 1.21: Low-Income Population (2000)

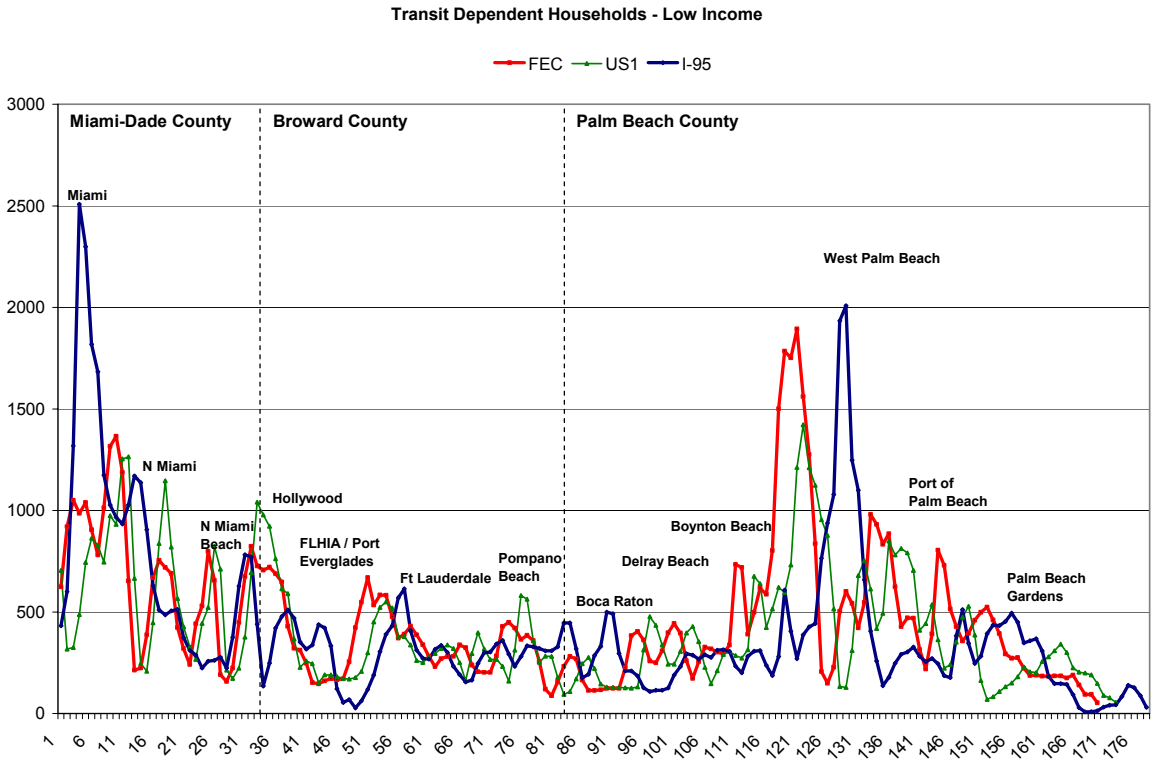
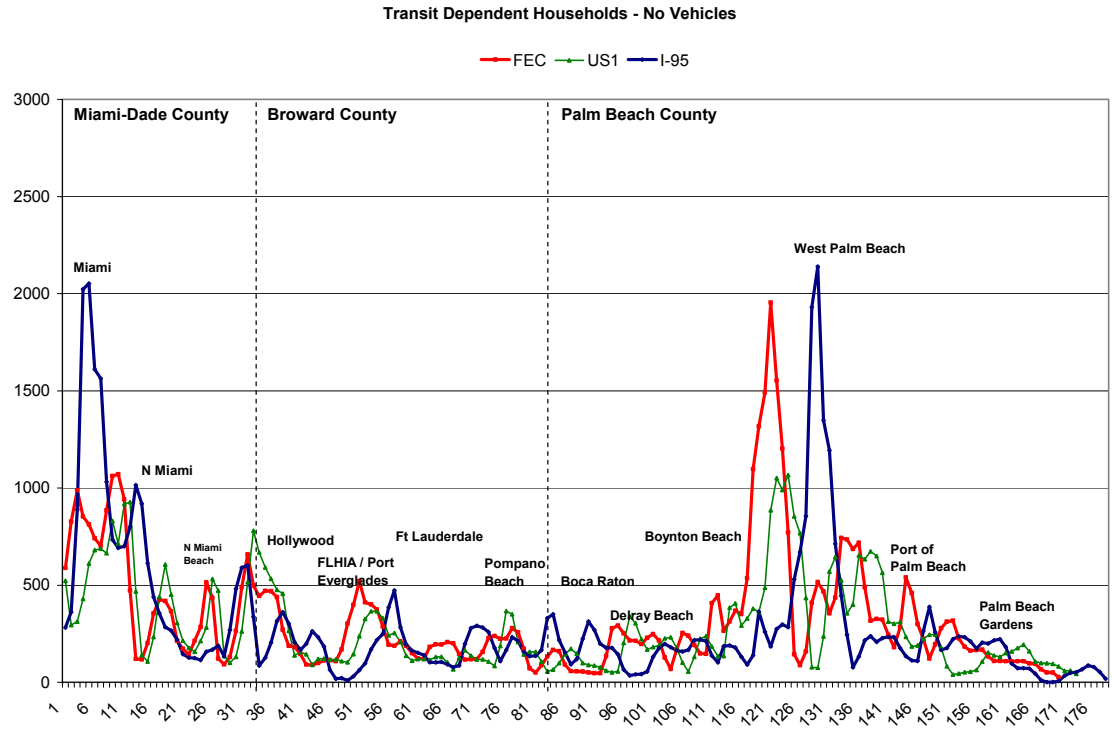


Figure 1.22: 0-Car Households (2000)



Although transit-dependent populations may benefit from local transit services operated by local agencies, there is a need for continuous transit service to maximize job opportunities as well as to provide access to affordable housing. A regional premium transit service along the FEC corridor area will connect people to where the jobs, housing, educational opportunities, health care and entertainment services are located thereby enhancing overall mobility options for transit-dependent groups.

Economic Development

A transit project along the FEC corridor area will support local redevelopment efforts thereby enhancing opportunities for jobs and mixed housing. Local governments along the corridor have included land adjacent to the FEC in Community Redevelopment Areas (CRA) to promote redevelopment activities. CRA designation provides a funding mechanism for infrastructure and other improvements within a designated area. The funding method is called Tax Increment Financing (TIF) whereby total property taxes for a CRA are assessed in a base year and any increase in tax revenue in the subsequent years is directly reinvested into the CRA. There are twelve CRAs in Miami-Dade County, seven existing and one proposed CRA in Broward County and nine CRAs in Palm Beach County within or in the immediate vicinity of the study area (**Figure 1.23**). In total, the land area of the CRA's in the study area comprises more than 21,000 acres.

Figure 1.23: Location of Community Redevelopment Areas

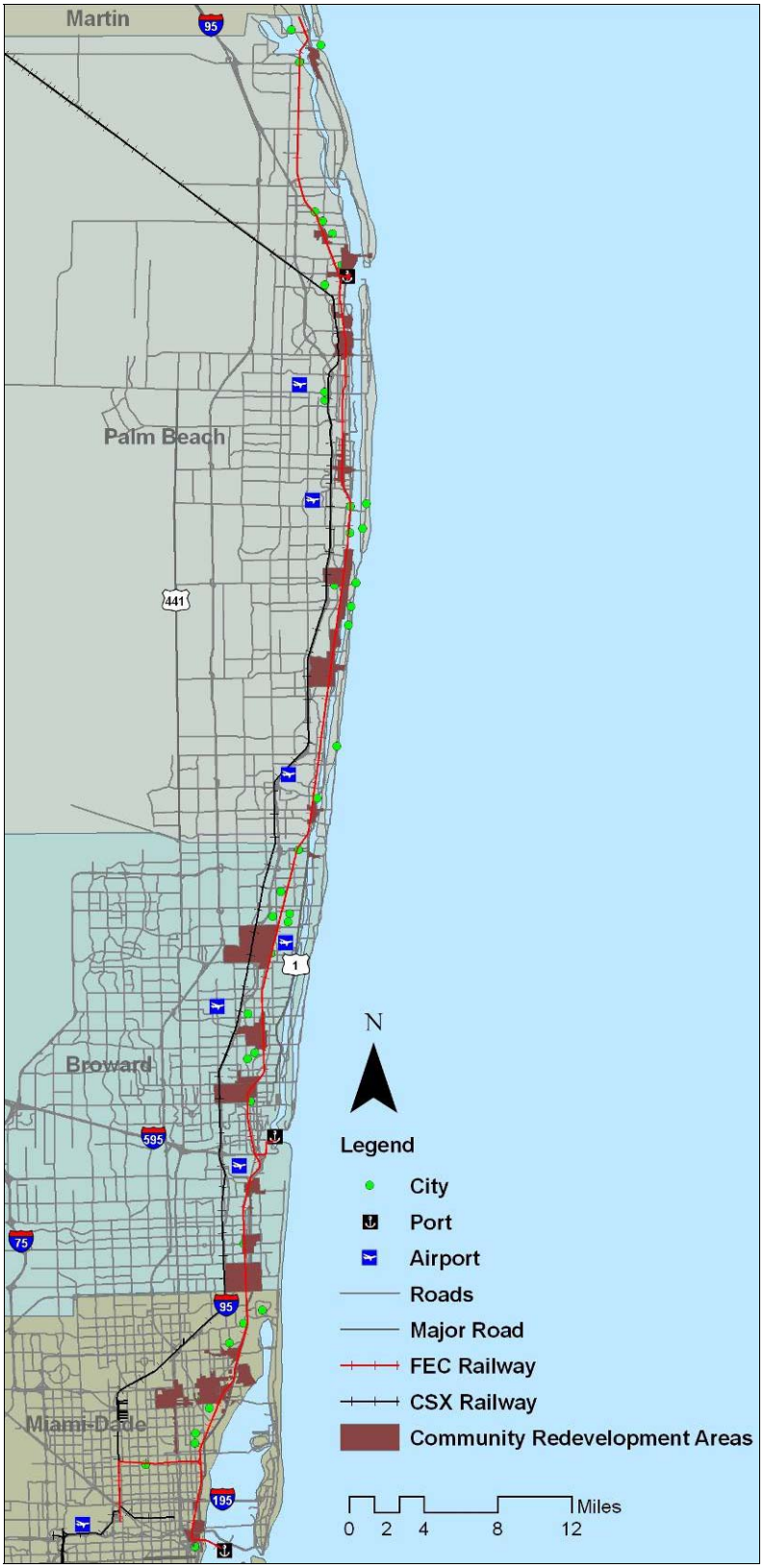
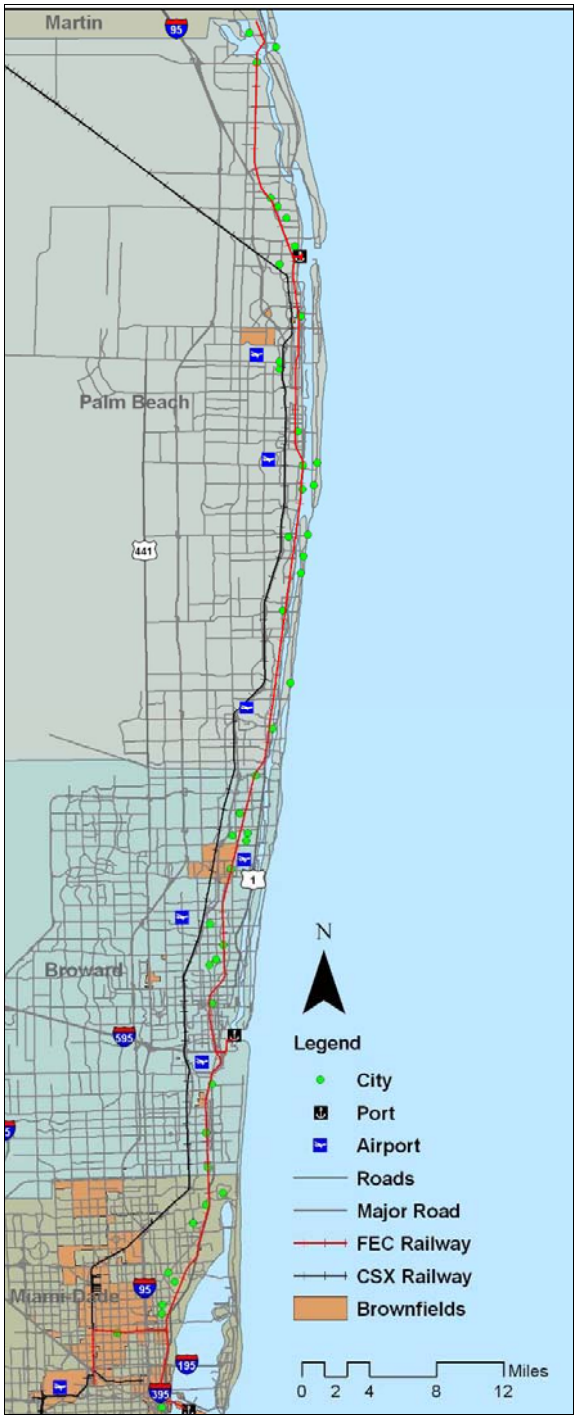


Figure 1.24: Brownfields

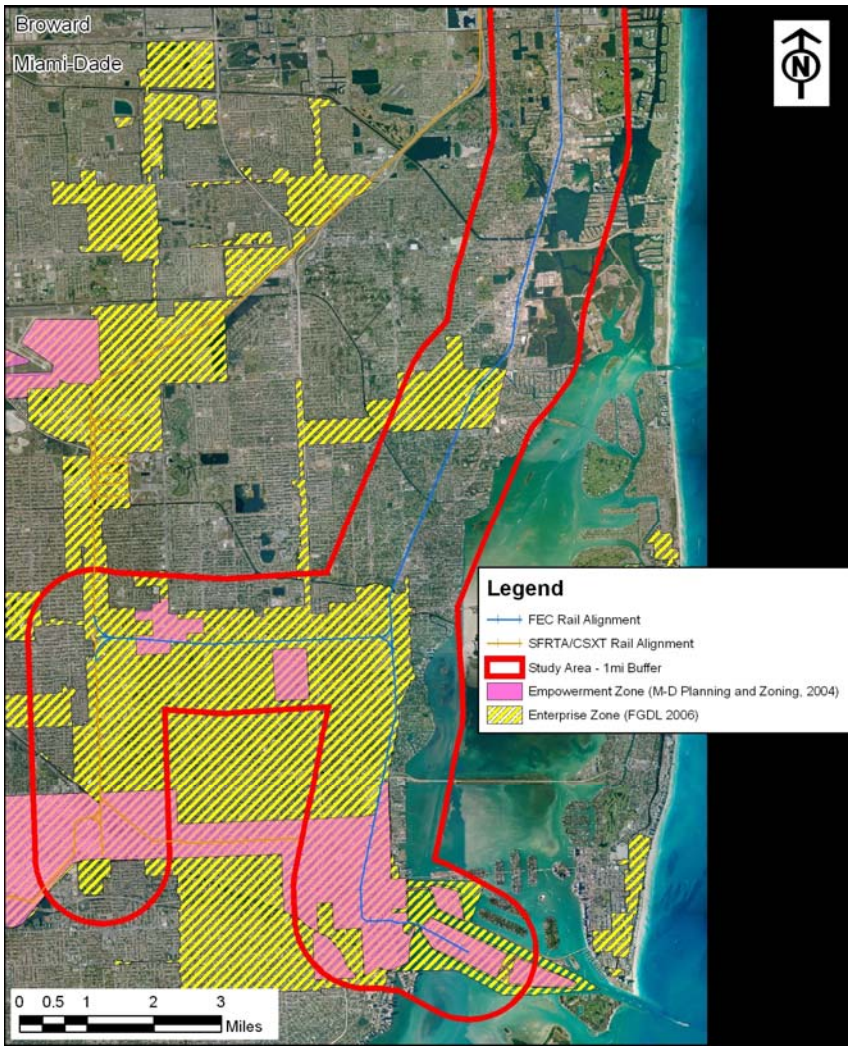


A transit project along the FEC corridor area would provide further impetus to redevelopment and cleanup of existing Brownfields. Brownfields are locations where previous industrial or commercial uses were located that produced different degrees of contamination of associated lands. These lands have the potential to be cleaned and reclaimed for other purposes. An example of a successful conversion of a Brownfield is in the City of Miami where an abandoned FEC rail yard is in the process of being converted

to a large mixed use development. Not only do the City and its residents benefit from the cleanup but they also benefit from the new use. As indicated in **Figure 1.24** most of the Brownfields along the study area are concentrated in Miami-Dade County. In Broward, the major Brownfield site is associated with FEC and its facilities and services in close proximity to Pompano Beach Airpark. In Palm Beach County there is one Brownfield close to an airport site.

The proposed action would encourage redevelopment efforts in existing Enterprise Zones located along the SFECCTA corridor which are State designated areas that receive tax benefits for redevelopment (see **Figure 1.25**). Federal Empowerment Zones are also created to encourage redevelopment and these designations are mostly found in Miami-Dade County along the southern boundary of the SFECCTA study area as depicted in **Figure 1.25**. These areas are also typically low income or minority areas which would benefit from further economic development spurred by a potential transit service along the FEC corridor area.

Figure 1.25: Empowerment/Enterprise Zones



The proposed action would be consistent with community land use plan and zoning changes to provide for more pedestrian and (TOD) in these areas. As part of the TOD, a mix of uses is also being encouraged as are opportunities for the provision of affordable housing. Local governments are encouraging public-private joint development opportunities at existing transit stations and are facilitating these opportunities at anticipated locations along the FEC corridor. These joint development opportunities strive to include a certain amount of affordable housing be built at locations in close proximity to transit. Should passenger service to be provided along the FEC corridor area, the economic development potential not only will accelerate in the area but also be transit friendly which is more compact and efficient type of development. A list of example local redevelopment efforts is provided below:

- The City of Deerfield Beach created a Dixie Business/Residential Zoning District that encourages pedestrian-oriented mixed use development on the west side of the FEC right-of-way.

- The City of Oakland Park has established a CRA that includes the FEC right-of-way and has developed design guidelines and an overlay zoning district to encourage pedestrian-friendly development in this area.

- The City of Wilton Manors created an Arts and Entertainment Special Overlay Zoning District that encourages an active mixed use district that is pedestrian-oriented. The City is also looking to change the Future Land Use Designation of the land adjacent to the FEC from Industrial to Mixed Use Residential, a new Broward County land use designation. Wilton Station, a mixed use project consisting of 272 multi-family dwelling units and 25,000 square feet of commercial retail, is currently under construction on Dixie Highway, north of 26th Street, adjacent to the FEC right-of-way.

- The City of Fort Lauderdale also has a CRA that encompasses the FEC right-of-way and, in conjunction with the County, is developing a Campus Master Plan to more efficiently use the publicly owned properties in Downtown Fort Lauderdale. A key component of this Master Plan is the incorporation of transportation, specifically public transit.

- The City of Dania Beach has several land use plans, including a CRA, a Redevelopment and Infill Plan and a Master Plan that include the areas adjacent to the FEC right-of-way.

- The City of Hollywood has a CRA that is adjacent to the FEC right-of-way and has completed a City-wide Master Plan that encourages higher density, mixed use development adjacent to the FEC right-of-way.

- The City of Hallandale Beach has a CRA bounded by I-95 to the west, NE 14th Avenue to the east, Broward/Miami-Dade County Lines to the south and Pembroke Road to the north. Eleven (11) development projects within the general FEC Corridor area will add 118,000 square feet of commercial space, 147 condominium units, 265 apartment units (or town home units) and an 80 acre mixed-use development called Village at Gulfstream Park.

- An intermodal center in the City of West Palm Beach would support Tri-Rail and its two planned expansions as well as rapid bus, standard fixed route, and community shuttle services.

- The Treasure Coast Regional Planning Council has a reference publication titled "The Florida East Coast Railroad: A Catalog of Coastal Cities and Redevelopment Opportunities along the Corridor" (1997), which provides a summary of proposals and opportunities to redevelop around historic rail stations from Vero Beach to Boca Raton.

Modal Interrelationships

- Problem: Highway capacity east of I-95 will not be able to accommodate anticipated growth

- Problem: Air and sea ports have poor connectivity with existing transit

- Problem: The South Florida transit grid is not well developed

Need: A project is needed that will complement the performance of highways and transit systems in the study area and provide direct connections to ports, airports and other multi-modal facilities.

- Proposed Action – A transit project along the SFECC study area:

  - Would potentially interface with and compliment multiple transportation modes including pedestrian and bicycle facilities via proposed greenway trails in Miami-Dade and Broward Counties. Greenway trails are currently planned adjacent to the FEC Railway right-of-way and any plans for transit along the FEC would accommodate bicycle and pedestrian travel by assuring that required safety improvements and separations are in place at the time of service implementation. Bicycles would be allowed on the transit vehicles similar to what is allowed in existing transit services and any improvements to at-grade crossings will consider safely accommodating bicycles and pedestrians as well as vehicles.

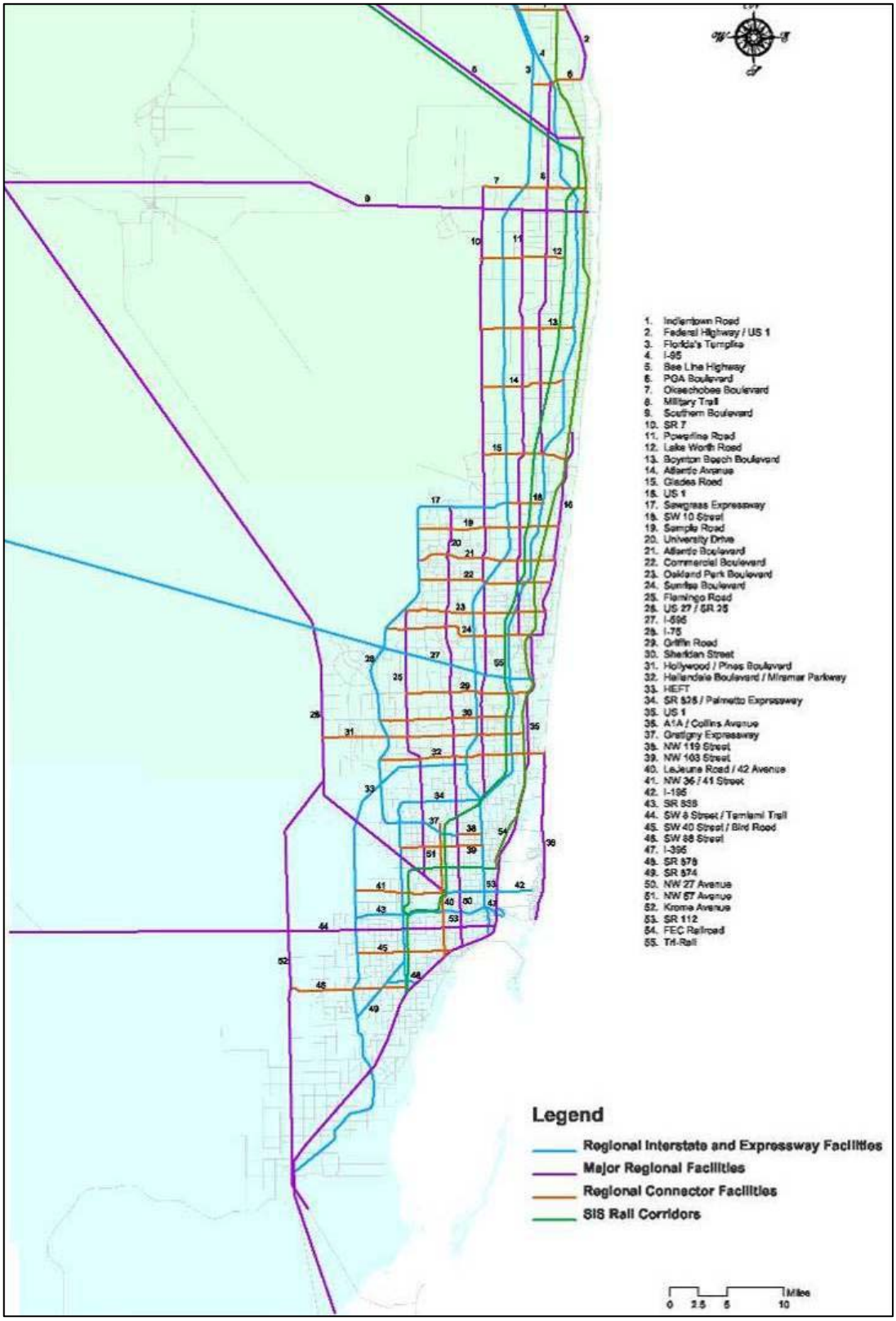
Table 1.9: Selected South Florida Premium Transit Projects

Name/ Location	Limits	Lead Agency	Funding Agency/ Status In FTA Program	Anticip. Opening Year
City of Miami Downtown Streetcar, Miami-Dade County	From: Downtown Miami (Loop) up NE 2nd Avenue, through MidTown Development To: Miami Design District (Loop)	COM	No FTA funding sought.	2009-2010
MIC-Earlington Heights Metrorail Connector, Miami-Dade County	Earlington Heights Metrorail station to Miami Intermodal Center	MDT	No FTA funding sought. Private/ public partnership. DEIS underway.	2010
Metrorail North Corridor, Miami-Dade County	From: Dr. Martin Luther King Jr. Metrorail Station to Broward/Miami-Dade County line	MDT	FTA/MDT Received FTA Recommended Rating.	2012
Miami-Dade County East – West Corridor Transit, Miami-Dade County	From: Florida International University (FIU) and SR 821/Homestead Extension of the Florida's Turnpike (HEFT) To: MIA/MIC	MDT	Supplemental DEIS underway.	2014
Transit Bridge Project on SR 7/US 441, Southern Broward/ Northern Miami-Dade Counties	From: Golden Glades Interchange (Miami-Dade County) To: I-595 (Broward County)	BCT/MPO, MDT	Funded for the PE stage only (underway), no FTA funding sought.	TBD
Central Broward East-West Transit Corridor on I-595, Broward County	From: I-75/Sawgrass Expressway interchange To: East of I-95 in the vicinity of Downtown Ft. Lauderdale and the Ft. Lauderdale/Hollywood International Airport (FHIA)	FDOT District 4	FTA funding sought. Refining LPA (as an LRT) and the New Starts funding submittal.	2022
DDA Downtown 2nd Street/ Andrews /3rd Avenues Rail Link, Broward County	From: Davie Boulevard To: Sunrise Boulevard AND From: S.W. 4th Avenue To: Federal Highway	BCT	LPA 2006	2009
SR 7 RBT, Broward County	From: Golden Glades Interchange (Miami-Dade County) To: Florida Atlantic University (Palm Beach County)	BCT/FDOT District 4	County funding (Miami-Dade, Broward, and Palm Beach), 1st three years funded as a demonstration project with permanent funding in the fourth year as warranted.	TBD
Broward County Intermodal Center and People Mover (Airport/ Seaport Connector), Broward County	From: FHIA To: Port Everglades	Broward County FTA Cooperating Agency	FHWA PD&E underway, FDOT District 4 liaison to FHWA and FTA (MOU currently under draft)	2010-2016
Central Palm Beach County Premium Transit Study (aka Okeechobee Blvd BRT), Palm Beach County	From: Wellington Mall To: Tri-Rail West Palm Beach Station	SRFTA/ PBMPO	SFRTA/ PBMPO (50% funding split for the study only)	TBD
Tri-Rail North Extension to Jupiter, Palm Beach County	From: West Palm Beach To: Jupiter/Northeastern Palm Beach County Area	SFRTA	Now incorporated into the SFECCTA	TBD

- Would interface with the existing transit system in the three counties: Miami-Dade Transit (MDT), Broward County Transit (BCT), Palm Tran, Tri-Rail, Amtrak (National Railroad Passenger Corporation), Intercity Bus Services (i.e. Greyhound), Jitneys (privately operated public transit vehicles intermediate between taxis and buses), Shuttle Bus Services, Para-transit Services, and Waterborne Transit.
- Would also link to planned transit projects in South Florida as indicated in **Table 1.9** above.
- Would link three international airports (Miami, Ft. Lauderdale and Palm Beach).
- Would maximize the use of an existing direct rail link between three seaports (Port of Miami, Port Everglades and Port of Palm Beach). Maximizing the use of this link for freight transport can reduce truck traffic along already congested roadways.
- Would provide a potential for interconnections between the major seaports and airports in the SFECCTA study area.

Overall, the proposed project is critical to making viable intermodal relationships at both the regional and local levels for travel within and between the counties and cities. As such, it is included in the tri-county Regional Long Range Transportation Plan as a key corridor (number 54 in **Figure 1.26**).The proposed project can successfully complement the airports and seaports with mass transit connections to them and between them, and all travel modes, including other transit systems such as the pedestrian and bicycle facilities networks that are within the SFECCTA study area.

Figure 1.26: Corridors of Regional Significance



Safety

- Problem: Alternative north-south roadway corridors serving the study area have the highest incidence of crashes. Based on five years of crash data (2000 -2004) obtained from FDOT for the state roads that cross or parallel the FEC Railway corridor within the study area, it was found that US-1 is the roadway that had most crashes within the study area in Miami-Dade County (39 percent of the total crashes that occurred at the study area) and in Broward County (23 percent of the total crashes that occurred at the study area). In Palm Beach, I-95 is the roadway that had most crashes within the study area (47 percent of the total crashes that occurred at the study area).

Need: An alternative to roadway travel in the eastern communities is needed that is safe to the traveling public.

- Proposed Action – A transit project along the SFECC study area:

  - Is anticipated to improve safety since taking commuters off the roadways and freeways reduces their interactions with other vehicles, especially trucks. Trucks, particularly large tractor-trailer trucks, contribute disproportionately to highway congestion (due to their size and operating characteristics) and to highway crash severity (due to their size and weight). Incidents and crashes involving large trucks also tend to last longer and block more lanes than those involving automobiles (due to their size and/or cargo).

  - Would reduce the overall vehicular congestion in the area which also allows for greater access and travel time benefit to emergency vehicles in and around the study area which includes several major hospitals.

  - Would provide a north-south transit alternative to vehicle travel along US-1 and I-95 in the study area and potentially reduce the number of vehicle crashes along these high crash location roadways. A north-south premium transit alternative would also reduce the potential for crashes along roadways where street transit (such as buses) operates.

A crash summary by mode analysis indicated that in the tri-county area, from 2000 to 2004, there were a total number of crashes by train of 22, by bus of 559 and by auto of 63,617. Train crash information did not include any Tri-Rail numbers. This information substantiates that transit travel appears to be safer than motor vehicle travel. The safety of transit travel in relation to other modes is further substantiated by fatality rates compiled by the National Safety Council (NSC) shown in **Table 1.10**.

While the NSC does not report rail transit fatalities for heavy, light and other rail, the FTA safety statistics compiled from 540 of the largest transit agencies in the country indicate that among transit modes,

commuter rail accounted for the largest share of fatalities (41 percent of total) followed by bus (27.9 percent of total), heavy rail (26 percent of total), and light rail (4.6 percent) indicating that the lighter the rail vehicle the less number of fatalities are associated with it.

Table 1.10: Fatality Rates by Mode of Travel (2000-2002)

Type of Vehicle	Death Rate
	Number of deaths per 100 million passenger miles
Airlines	0.02
Automobile	0.79
Vans, SUV's, pickup trucks	0.76
Heavy, light and other rail	Not reported
Intercity and commuter railroads	0.03
Intercity buses	0.02
Transit buses	0.01

With respect to this study, railroad crossing safety is an important issue that has been discussed at the public meetings and will be further analyzed in Tier 2. There are at least 202 at-grade rail/roadway crossings in the SFECCTA study area, at a closely spaced average of 2½ crossings per mile, which is an important consideration with a documented and controversial history. Public safety at roadway crossings of railways (especially those with at-grade, or "highway-rail grade" crossings) is a very sensitive issue for this densely populated and highly utilized corridor, just as it is for other rail/transit corridors nationally. A program to consolidate, close and/or grade separate crossings is being discussed for eventual implementation should passenger rail be added to the FEC Railway corridor.

However, a summary of the crashes that occurred at the FEC at-grade railroad crossings within the study is presented in **Table 1.11** and seem to indicate that crashes along the railway corridor during the last few years have been minimal in the tri-county area. Again, this information substantiates that a potential passenger service along the FEC as an alternative to the congested and high crash north-south roadway corridors could provide a safe alternative to the traveling public in the area.

Table 1.11: At-grade Railroad Crossings Crash Summary

County	Location	MP	Railroad Crossing	Total Number of Crashes Per Year					Total
				2000	2001	2002	2003	2004	
Miami-Dade	N.E. 6th Avenue in Miami	0.249	RR 272618		1				1
Broward	Oakland Pk Blvd. in Wilton Manors	7.791	RR 272544	2					2
	Pembroke Road in Hallandale Beach	6.173	RR 272590		1				1
	Pembroke Road in Hallandale Beach	7.775	RR 272544					2	2
Palm Beach	Glades Road in Boca	7.372	RR 272910	1	1				1
	Okeechobee Road in West Palm	8.596	RR 272430		1				1
	PGA Blvd	6.521	RR 272381R			2			2
	PGA Blvd	8.596	RR 272430					1	1
Total				3	3	2	0	3	11

1.3. Goals and Objectives

Based on the need established above and the public scoping and involvement process, the following Goals and Objectives were developed for the SFECCTA study (see **Table 1.12**). These goals will be used in the evaluation of alternatives as discussed in the next chapter.

Table 1.12: Goals and Objectives

Goal 1: Improve mobility and access for personal travel and goods movement.

- Expand transit options to accommodate future travel demand in the corridor and serve major transportation hubs, employment, medical, retail, educational, and entertainment centers, and residents in the region.
- Provide regional transit options that improve travel time reliability for people and goods and results in travel time savings.
- Integrate the proposed transit options with existing and planned transit in the region.
- Integrate the proposed transit options with existing and planned freight transport and potentially intercity passenger transport located within or traversing the study area.
- Provide for seamless connections to all modes of transportation including bicycle and pedestrian facilities.
- Provide regional access and mobility improvements for minority, transportation disadvantaged and low income groups.
- Support goods movement in the corridor with higher capacity and connectivity.

Goal 2: Coordinate corridor transportation investments to contribute to a seamless, integrated regional multi-modal transportation network.

- Invest in infrastructure, facilities and services that improve connectivity, transfer and circulation in the region.
- Coordinate and integrate with other regional rail, mass transit, and roadway projects.
- Maintain working relationships with transportation partners, including the FTA, FDOT, Regional Transportation Authority, MPOs, Counties, Cities, Regional Planning Councils, Business Groups, Florida East Coast Industries, and other stakeholders.
- Avoid and minimize duplication of premium transportation services.
- Coordinate with other transportation and land use planning efforts that are supportive of transit options.
- Accommodate a proposed greenway along the corridor.

Goal 3: Encourage the implementation of transit supportive development.

- Locate transit stations where higher density development exists or can readily be accommodated and near activity centers.
- Compliment and support economic development/redevelopment and potential joint development activities that include a mix of uses and affordable housing, within the study area.
- Establish a transit improvement that will contribute, guide and support the urban, transit-oriented scale envisioned for the various downtowns, commercial corridors and abutting residential areas.
- Facilitate creation of transit-supportive and context sensitive development guidelines, zoning and policies.
- Provide transit that complements the scale and character of neighborhoods, housing, and business developments.

Goal 4: Minimize adverse impacts to the community and local businesses.

- Minimize or mitigate adverse local traffic, parking and safety impacts.
- Minimize or mitigate adverse noise and vibration impacts.
- Avoid and minimize adverse impacts to minority and low income communities.
- Minimize adverse right-of-way and physical impacts to established communities and businesses.
- Optimize the use of existing infrastructure and transportation corridors for expansion of transit.

Goal 5: Preserve and enhance the environment.

- Minimize or mitigate adverse impacts to existing environmental resources.
- Preserve historical and cultural resources.
- Provide transit options to reduce traffic congestion and energy consumption.
- Protect environmentally sensitive areas.
- Improve regional air quality by promoting alternative transportation modes and reducing auto emissions.

Goal 6: Provide a cost-effective transportation solution to meet identified travel needs consistent with the availability of implementation and operating funds.

- Provide new transit service that is financially feasible with existing and new revenue sources.
- Meet FTA goals as they relate to cost effectiveness.
- Ensure that the investment strategy for the corridor will be eligible to receive federal funding.
- Optimize transportation funding resources and obtain local financial support.

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2.1. Screening and Scoping of Alternatives

The goals of this DPEIS are to define the general concept and scope of the best improvement strategies (alternatives) to meet the future (2030) transportation needs of the SFECCTA study area, as detailed in the Purpose and Need. The physical and operational characteristics of each strategy are defined in sufficient detail to support the decision-making process through the differentiation of the individual qualities and attributes of each competing improvement strategy. The benefits and costs of each alternative concept needs to be sufficiently defined to inform decision-makers of the tradeoffs of each strategy and how they may best be implemented in consideration of engineering, environmental, financial, public input, land use and community development factors. Furthermore, sufficiently detailed definitions of the preferred alternatives and their characteristics are needed to allow for the defendable identification of the next steps within the tiered process and the limits and scope of the second tier studies. Therefore, this chapter of the DPEIS provides a description of the potential alternatives (improvement strategies) developed and evaluated, including potential station area assessments, and their potential cost. An initial assessment of funding opportunities applicable to this project is also addressed.

As a general philosophy, alternatives were developed for the SFECC study area that are oriented towards addressing the longer-distance, north-south travel needs in the corridor and offer viable alternatives to travel by private automobile. It will be seen that this philosophy results in the early elimination of many street-based bus and rail technologies that have merit outside the context of this study but do not offer competitive travel times against the automobile. In the final recommendations for further study, this may result in the virtual elimination of alignments other than that of the FEC. However, it is possible that no other alternative may prove cost-effective as a three-county corridor service beyond that already existent in Tri-Rail (represented herein by the TSM Alternative). Should that ultimately prove to be the case, the conclusion should be interpreted as endorsement for development of smaller, sub-regional corridor services in the SFECCTA study area.

For the purposes of this study, an *alternative* is defined as a *unique combination of an alignment and modal technology, designed to address a specific need for service*. The SFECCTA alternatives development and evaluation process is outlined in **Figure 2.1**.

Potential transportation improvements, including those suggested during the scoping input process, were identified as preliminary alternatives if they appeared to have the potential of satisfying some aspect(s) of the project goals and objectives (**Table 1.12**) and appeared to be technically both reasonable and feasible. Each of the action alternatives is a combination of mobility solutions packaged to work together as a system, therefore, the existence of Tri-Rail service along the SFRC, and its connection to Metrorail at

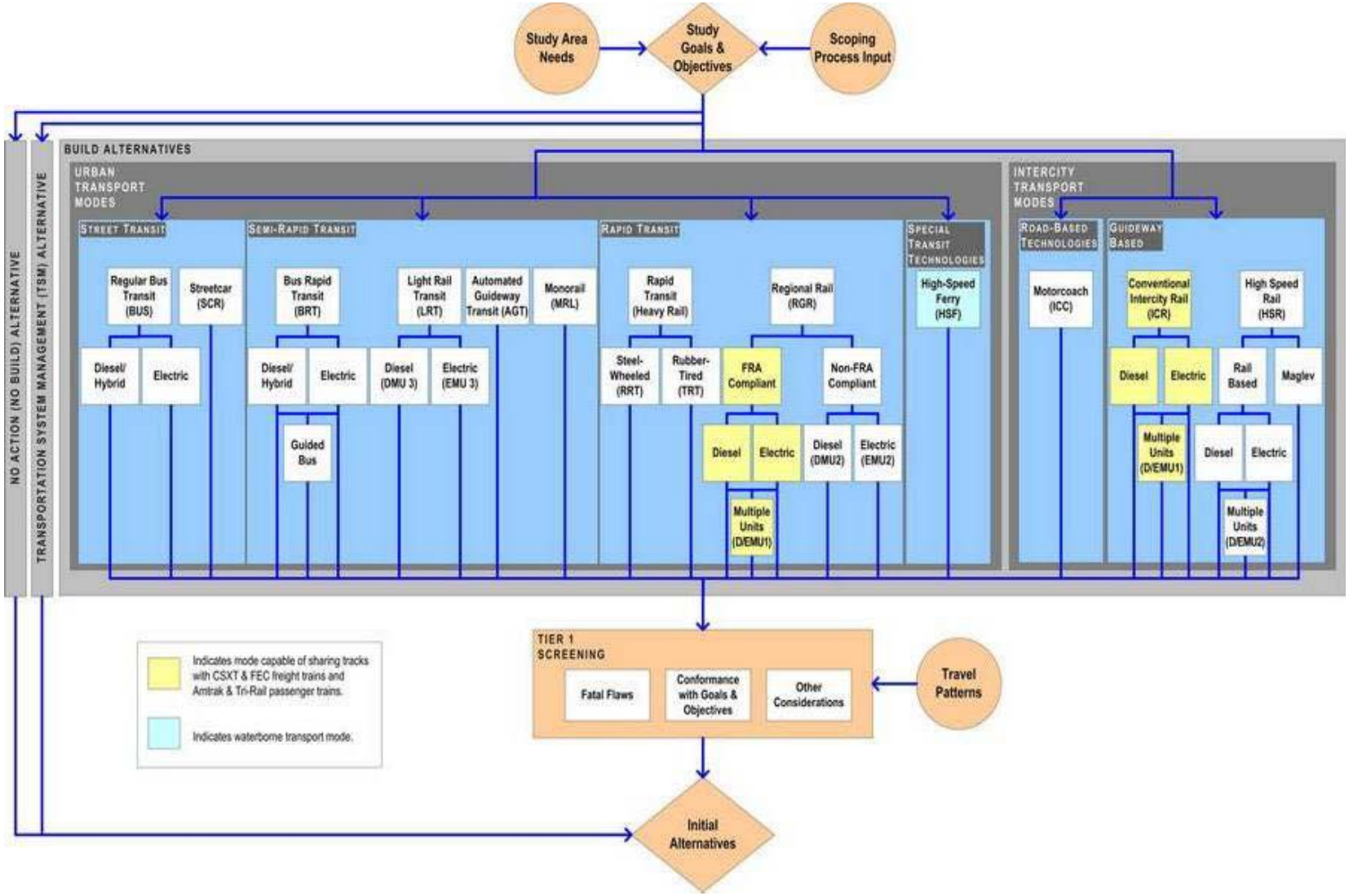
the south end of the corridor, is viewed as a base part of the system from which to build alternatives. Moreover, because there is a potential for shared railroad right-of-way use, the build alternatives for passenger rail service along the FEC Railway alignment must also facilitate freight movement and other existing and proposed uses of the railway. In addition to the alternatives developed, this chapter also provides information on the No-Build and TSM alternative as well as alternatives considered but rejected from further consideration.

The preliminary alternatives discussed below represent a range of transportation modes appropriate to the initial screening phase of the alternatives development process. With each successive phase in the alternatives analysis process, the definitions of remaining alternatives will become more detailed and their evaluation will be progressively more quantitative, as follows:

- Qualitative screening of conceptual, single-mode alternatives to eliminate any alternative deemed to be not reasonable or feasible, identifying an initial list of alternatives—each of which addresses some aspect(s) of project goals and objectives—for further development and screening analysis;
- Comparative screening analysis of the initial list of alternatives—each of which will be further defined to a sketch level of detail for comparative screening purposes—with some alternatives paired or combined to create multimodal alternatives that may satisfy project goals and objectives; and
- Detailed analysis of a short list of detailed alternatives selected on the basis of the comparative screening, in order to provide a sufficient technical basis for selecting a preferred alternative.

Evaluation of the reasonable alternatives was coordinated with the public and agency coordination program (see Chapter 7). Through collaboration of the study's public and agency involvement, and the preliminary engineering and environmental impact evaluation, a general consensus in support of preferred alternatives to further study in Tier 2 is anticipated.

Figure 2.1: SFECCTA Alternative Development & Evaluation Process



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2.2. Alternatives Development

Alternative development was facilitated by information found in previous studies centered along the SFECCTA study area, public scoping meetings, and an analysis of available alignments, technologies, and travel service needs within the study area. Various technologies and alignments were screened based on their applicability to serve the needs of the study area (effectiveness), their ability to meet the project goals and objectives, their impact on adjacent uses or natural resources, and cost effectiveness.

2.2.1. Alignments

As a result of inputs received during the project scoping process, the SFECCTA study area was defined as one-mile on either side of the alignment of the FEC Railway. Reflecting the north-south orientation of this defining spine of the study corridor, a number of potential alignments were identified for alternatives based on existing north-south transportation corridors. These alignments included:

- The FEC Railway;
- The SFRC (Tri-Rail, CSXT and Amtrak);
- US- 1 and various parallel arterials including Dixie Highway, Federal Highway and Biscayne Boulevard;
- The Intra-Coastal Waterway; and
- Utility rights-of-way and state canal properties where appropriate to make connections.

2.2.2. Modal Technologies

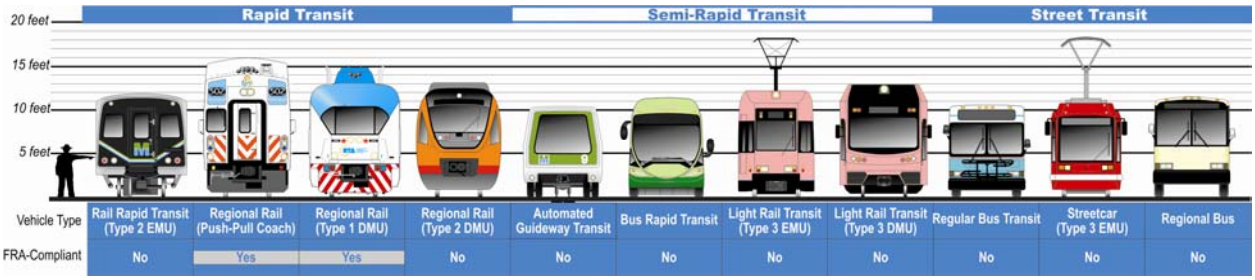
An *urban transport mode* is defined by a combination of three basic characteristics: *right-of-way, technology* and *service*. Urban transport modes fall into three basic groupings based on commercial (average travel) speed and functional capacity:

- *Street Transit*, consisting of modes operating in a mixed traffic environment at commercial speeds lower than that of surrounding traffic due to time lost at passenger stops. Street transit in the form of regular bus transit, electric trolley bus, regional bus, and streetcar were analyzed for applicability to the FEC Railway corridor study area.
- *Semi-Rapid Transit*, consisting of modes operating mostly in exclusive or semi-exclusive rights-of-way at commercial speeds approximating the adjacent corridor traffic. Bus Rapid Transit, Electric Rapid Bus, Guided Rapid Bus, Light Rail Transit, Automated Guideway Transit (AGT), and Monorail were analyzed for applicability to the FEC Railway corridor study area.

- *Rapid Transit*, consisting of modes operating in exclusive rights-of-way and exhibiting high speed, capacity, reliability and safety. Rail Rapid Transit (heavy rail) and Regional Rail (commuter rail) were analyzed for applicability to the FEC Railway corridor study area.

Examples of urban transport technologies considered are illustrated in **Figure 2.2**. The full range of passenger transportation modes considered for the FEC study area is described in greater detail in the "SFECC Alternative Analysis – Modal Technologies" technical memorandum.

Figure 2.2: Urban Transport Technologies



Beyond urban transport modes, two other *intercity passenger transport modes* operate in the SFECCTA study area:

- Conventional intercity railroad trains operated by the National Railroad Passenger Corporation (Amtrak) between Penn Station New York and the Amtrak's Miami Station in Hialeah.

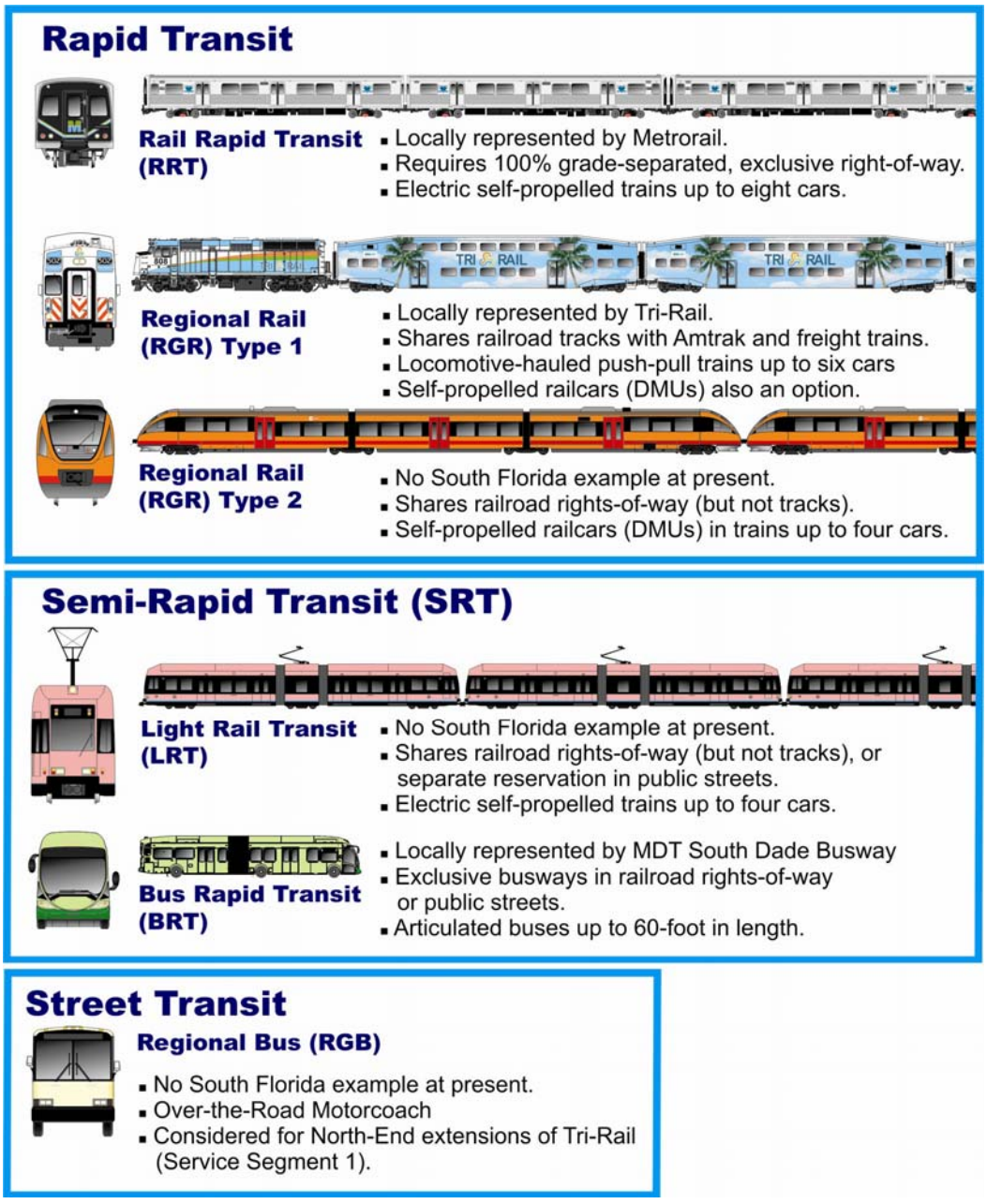
- Conventional intercity motorcoach services operated by Greyhound Lines, Inc.

Intercity passenger transport services differ from urban transport modes in terms of their extent and distance between stops, oriented more towards longer-distance, inter-regional travel. As such trips extend far beyond the limits of the SFECCTA study area, no new intercity transport alternatives were considered as part of this study. Nevertheless, Amtrak and Greyhound are recognized as strategic services with which alternatives developed through this study process need to be coordinated at key intermodal facilities. Further, Amtrak in conjunction with the State of Florida and several eastern seaboard counties are considering the possibility of rerouting some Amtrak services over portions of the FEC alignment. While these plans are still under development, the potential rerouting of Amtrak train service in the corridor needs to be accommodated in the alternatives development process.

As illustrated in **Figure 2.1**, a broad range of street transit, semi-rapid transit, rapid transit and special transit modes were considered for the SFECCTA study area. Reflecting the Project Goals and Objectives as well as input received during the scoping process, study efforts concentrated on the development of semi-rapid transit and rapid transit modal options as line-haul service in the corridor to accommodate longer-distance, regional journeys.

Five modal technologies remained after an initial (Tier 1) round of screening as illustrated in **Figure 2.3.**:

Figure 2.3: Modal Technologies at the End of Tier 1



- Bus Rapid Transit (BRT), like the Miami Dade Transit South Dade Busway, a semi-rapid transit mode employing high-capacity, roadway-based vehicles on exclusive or semi-exclusive rights-of-way.
- Light Rail Transit (LRT), a semi-rapid transit mode employing trains of self propelled rail vehicles on exclusive or semi-exclusive rights-of-way.

- Regional Rail (RGR, also referred to as "commuter rail)**,** like Tri-Rail, a rapid transit mode employing trains of railroad-compatible vehicles that may or may not be compliant with Federal Railroad Administration (FRA) regulations.

- Rail Rapid Transit (RRT)**,** like MDT Metrorail, a rapid transit mode employing trains of self-propelled rail vehicles on exclusive rights-of-way. This mode was identified as being applicable only in the southern end of the corridor where it would function as an extension of the existing Metrorail system.

- Regional Bus (RGB)**,** a longer distance, limited stop variation of street transit employing over-the-road motor coaches. This mode was identified as having limited applicability as a rubber-tired extension of existing Tri-Rail service.

2.2.3. Alternatives Considered but not Advanced in Tier 1

A number of alternate technologies were considered but not advanced as part of a SFECCTA process.

- High Speed Ferries (HSF) along the Intracoastal Waterway (ICWW) was analyzed as an alternative for the corridor due to its availability to serve the South Florida area and information received from prior studies regarding the potential use of this technology in the area. However, the success of HSFs is heavily dependent upon the availability of an appropriate, unencumbered waterway between two activity centers and complementary land-side transportation connections. The challenges associated with applying HSF as a modal technology in the SFECCTA are:

  - Wake restrictions and protected West Indian manatee habitats in Biscayne Bay and along the ICWW would significantly limit HSF operating speeds.

  - Much of the waterfront in Miami, Fort Lauderdale and West Palm Beach, as well as other study area communities are increasingly devoted to residential uses, as opposed to commercial activities that would attract commuter trips.

  - A significant proportion of the central business and commercial districts of Miami, Fort Lauderdale and West Palm Beach are not within reasonable walking distance of their waterfronts, requiring new circulator/distributor systems to transport HSF passengers to and from activity centers.

  These concerns limit its applicability as a new primary line-haul service for the SFECCTA. Therefore, this technology and alignment are not being advanced for further study due to its negative impacts on adjacent land uses and its effectiveness in meeting the needs of the area.

- Electric propulsion technologies, for the most part, were eliminated from further study due to requisite overhead power distribution systems that are vulnerable to damage from storms and wind-blown debris which are common in South Florida. Moreover, electric power distribution systems can cost about a

third more than on-board propulsion systems. Such additional investment is often warranted in areas where there is a challenge attaining federal air quality standards, but this is not the case for South Florida. The electric propulsion technologies eliminated include Streetcar and Electric Bus (in regular service or BRT).

- Local bus service, streetcars and other street transit modes were eliminated from consideration due to their low commercial speeds which would make this group of modes uncompetitive with the private automobile over the atypical length of the study corridor. Streetcars and bus services, however, have the potential to be significant secondary service in Downtown Miami and/or Fort Lauderdale, providing necessary collector and distributor functions in support of primary corridor line-haul services.

- Guided Bus technology is in an experimental phase of development and has not yet been accepted for wide spread use by transit systems. Even the Rapid Guided Bus technology would be limited in its applicability to the corridor based on the necessary infrastructure to build dedicated lanes to achieve a moderate speed and the number of grade crossings a surface bus alignment would encounter. This level of investment for an unproven technology was not considered a feasible alternative and therefore is not being advanced for further study.

- Automated Guideway Transit's (AGT) relatively high capital cost limits its applicability as a new primary line-haul service for the SFECC or as a cost-effective secondary collector/distributor service anywhere other that in Downtown Miami, where it already exists. Similarly, the Monorail technology was eliminated from further study due to its cost effectiveness and ability to meet the project goals of providing line haul service as well. Monorails overall have limited passenger-carrying capacity and low commercial speeds.

- Rubber-Tired Rapid Transit (RTR) systems exist as an alternative to steel-wheeled, rail-based Rapid Rail Transit (RRT) systems. The relative complexity and higher operating costs associated with RTR technologies also has limited applications to very few systems worldwide and therefore is not being considered for the SFECCTA area. Rubber-tired rapid transit requires more wheels, more maintenance and cannot achieve as high speeds as steel wheeled transit. Therefore, due to cost effectiveness, this technology will not be advanced for further study.

- New Intercity Motor Coach and High Speed Rail (HSR) technologies are not considered applicable to the SFECCTA corridor since they serve longer distances and motor coaches are seen more as a distributor service rather than line haul service needed for the SFECCTA corridor. Moreover, HSR corridors are currently being analyzed at key locations throughout the country where competition with

air travel is a viable alternative. Therefore, due to effectiveness in meeting the project goals and need for the corridor, these technologies will not be advanced for further study.

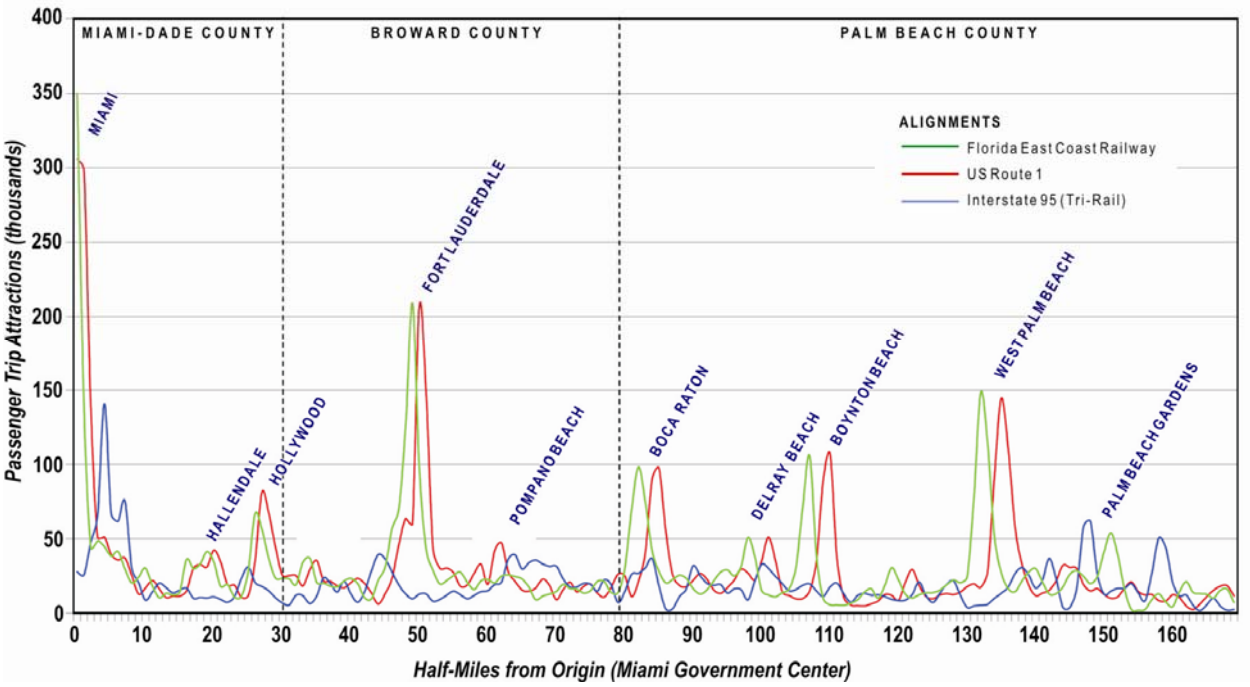
2.2.4. Service Markets and Segments

Due to the large size of the corridor, service needs/markets for the SFECCTA study area were identified at the sketch planning level by analysis of study area demographics and general patterns of travel forecasted for the year 2030 through the three-county SERPM. Various outputs of the SERPM were consulted in this initial round of travel pattern analysis including:

- 2030 Dwelling Unit Density
- 2030 Employment Density
- 2030 Productions and Attractions

Figure 2.4 illustrates 2030 attractions within a reasonable walking distance (0.5 mile) of the FEC, US-1 and I-95 alignments (the latter serving as a proxy of the Tri-Rail alignment) in half-mile increments. Of particular note in this diagram are the number of "spikes" along the FEC and US-1 alignments corresponding to the central business districts (CBDs) of Miami, Fort Lauderdale, and West Palm Beach, as well as, to a lesser degree, Hollywood, Boca Raton, Boynton Beach and other corridor communities. In contrast, comparable spikes do not appear in the plot of the I-95/Tri-Rail alignment, suggesting that this alignment is not as compatible as the FEC or US-1 alignments to walk-access at the destination end of a work trip. **Figures 1.6 – 1.8** in Chapter 1.0 provide similar information regarding productions and combined productions and attractions. This information substantiates early removal of I-95 from consideration as an alternative south of West Palm Beach. Moreover, given the presence of Tri-Rail immediately adjacent to I-95 south of West Palm Beach, alternatives involving the I-95 alignment are effectively included in the No-Build and TSM alternatives.

Figure 2.4: 2030 Corridor Attractions within 0.5-Mile of Candidate Alignments



Building upon these observations, 2030 "Desire Lines" maps were consulted for the key destinations identified in **Figure 2.5**. In this application, desire line maps were drawn to the key destinations from trip origins located in the north-south oriented SFECCTA study area. The results of the desire line maps for the six most significant destinations identified in **Figure 2.4** are presented in **Figure 2.5**.

As depicted on the desire line maps, the desire for travel from and to the Miami CBD was most extensive in length and number of trips. Other significant markets were from Hollywood north to Delray and Hollywood south to Miami and from Ft. Lauderdale, north to Palm Beach Airport and south to Miami. Desire to travel from one end of the corridor to the other was minimal. Review of model data for these six activity centers suggested a series of north-south travel corridors centered on multiple nuclei, as opposed to a singular set of travel patterns oriented towards a sole central business district. Therefore, reasonable alternatives would have to provide service to a number of intra-line trips with minimal service for the relatively few end-to-end trips.

Other conclusions reached from reviewing available information included:

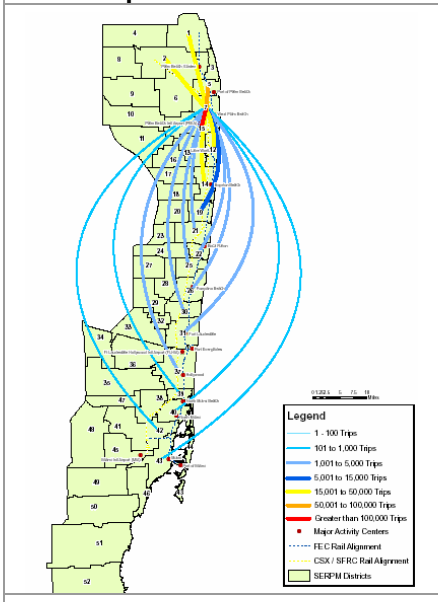
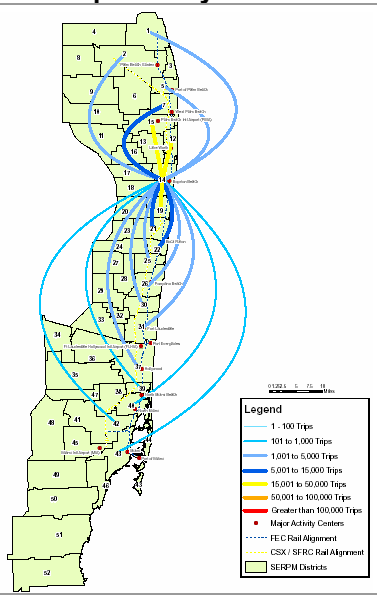
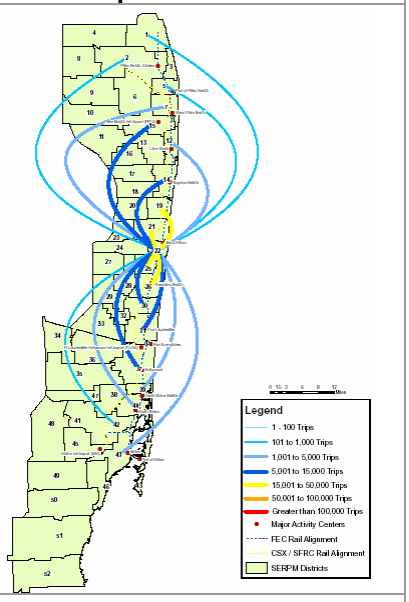
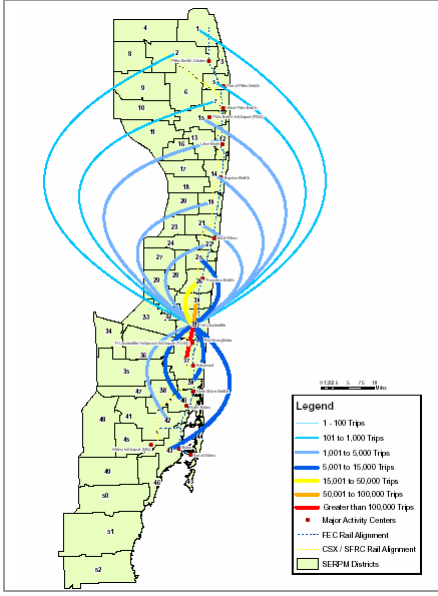
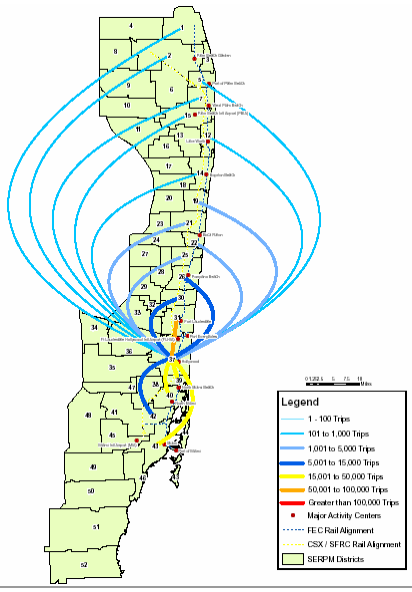
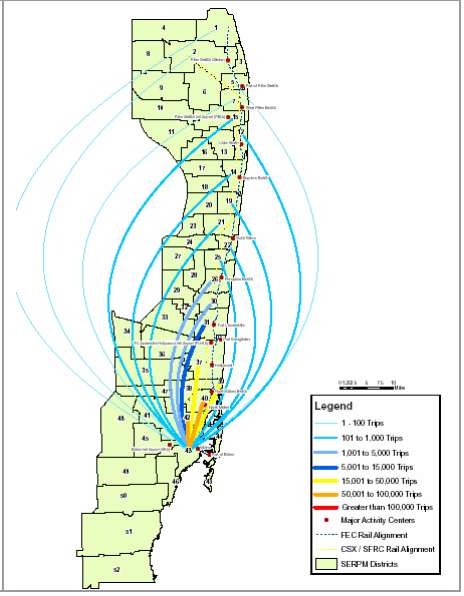
- There are sufficient residential densities to warrant semi-rapid and rapid transit modes in much of the SFECCTA study area. As a general "rule of thumb," semi-rapid transit modes (BRT and LRT) require residential densities greater than three dwelling units (DU) per acre with predominately park-ride access and greater than nine DUs per acre for predominately pedestrian access. Rapid transit modes

(RRT and RGR) generally require residential densities greater than 12 DUs per acre or as low as one DU per acre, respectively.

- Analysis of the suitability of transit at the employment end of a journey of work requires a different approach as it is generally limited to a reasonable walking distance (about a ten-minute walk) unless other connecting transit services are readily available. An analysis of model attractions (destination-ends for SERPM home-based work trips) within a half mile of the FEC, US-1 and I-95 alignments identified six significant employment centers within walking distance of the FEC and US-1 alignments:
  - Downtown Miami
  - Downtown Hollywood
  - Downtown Ft. Lauderdale
  - Downtown Boca Raton
  - Downtown Boynton Beach
  - Downtown West Palm Beach

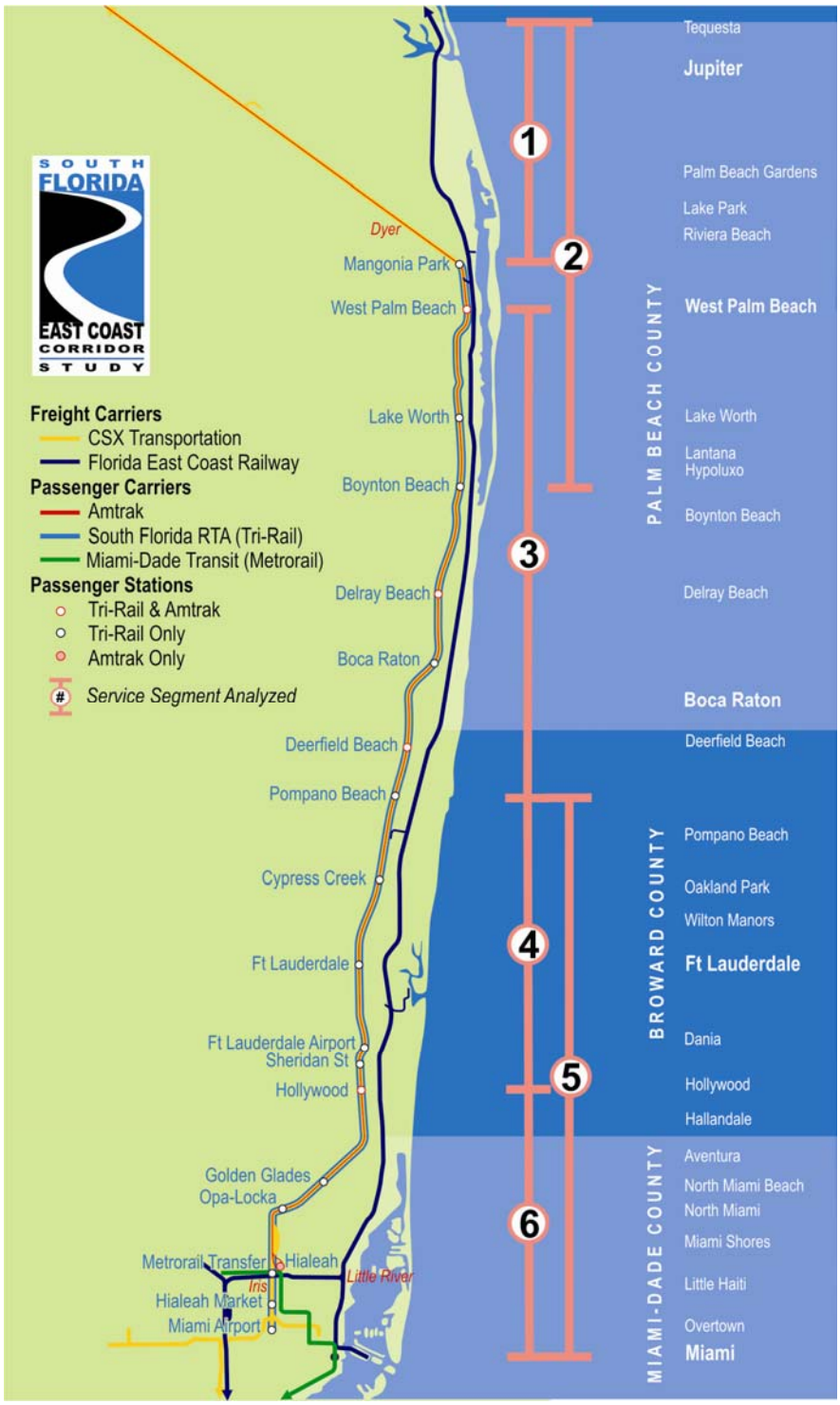
Given the presence of multiple activity centers based on the travel markets identified above and the extraordinary extent of the SFECCTA study area, study efforts undertook the approach of subdividing the corridor into a series of discreet service segments for analysis purposes (**Figure 2.6**). One service segment (Service Segment 1) was designed to address "end-on" extensions of Tri-Rail to the northern limits of the SFECCTA study area. Five other service segments were designed as a basis of new corridor services reflecting the future patterns of travel specially identified through the "desire line" maps centered on one or two major activity centers. A specific range of alignments and applicable modal technologies were associated with each service segment.

Figure 2.5: 2030 Travel Desire Line Maps for Leading Corridor Destinations

2030 Trips to West Palm Beach	2030 Trips to Boynton Beach	2030 Trips to Boca Raton
		
2030 Trips to Fort Lauderdale	**2030 Trips to Hollywood**	**2030 Trips to Downtown Miami**
		

Detailed descriptions of each of the six service segments follow in subsequent sections.

Figure 2.6: SFECCTA Service Segments



- **North End Connections:** Service Segment 1 and 2 options that use the FEC alignment require upgrading existing connections between the SFRC and the FEC or creating entirely new ones. Six potential connections, some with variations, were investigated in the vicinity of the north end of the SFECCTA study area between CSXT Milepost SX 971 and SX 965 and between FEC Milepost 300 and MP 291, as illustrated in **Figure 2.7**. The possible connections are described in **Table 2.1.**

Figure 2.7: North End Connections Investigated

Table 2.1: Possible Locations for North End FEC-SFRC Crossings

Option	Brief Description	Length (Approx)	Constraining Curve Radius	Potential Acquisitions
1	FEC K-Branch via Marcy and Ft. Pierce	30 miles[1]	None	Minor (new connection at Marcy)
2A	New Canal C-17 Alignment via MacArthur Blvd to FEC at MP 291.8	4 miles	<6 degrees	1 recreational park 1-2 industrial facilities 1 open storage lot
2B	New Canal C-17 Alignment via Silver Beach Road to FEC at Lake Park	3 miles	6 degrees	1-2 industrial facilities
2C	New Canal C-17 Alignment via Canal Frontage to FEC at MP 291.8	4 miles	11½ degrees	1-2 industrial facilities possible minor Garden Road relocation
3A	Existing Lewis Terminals Connector	1.7 miles[2]	12 degrees	2 commercial buildings
3B	New FP&L Right of Way Alignment	1.2 miles	9 degrees	1 surface parking lot 1 impoundment yard
3C	New West 13th Street Frontage Alignment	1.8 miles	6½ degrees	1 realignment of plant siding Realignment of W 13th St 1 impoundment yard 1 community park
4A	Existing Northwood Connector (avoiding Cemetery)	0.4 miles	18 degrees	Vacant industrial parcels
4B	Revised Northwood Connection (major re-alignment)	0.5 miles	6 degrees	Two commercial buildings 1 plot of open space in downtown (flood memorial)
5A	Waterworks Connection at Banyan Boulevard	0.5 miles	10 degrees	1 commercial building in the right of way
5B	Banyan Boulevard, via Oblique Alignment	0.8 miles	4½ degrees	Red Cross building on Clematis St. Two buildings on 2nd St.
5C	Waterworks, north of Courthouse hybrid	0.6 miles	10 degrees	2 unidentified buildings
6	Okeechobee Boulevard Median	0.6 miles	9 degrees	1 temporary commercial building

As noted in **Table 2.1** more than one possible alignment was identified at four of the six connections. The northernmost connection (Option 1 via the K-Branch) diverges from the FEC 39.8 miles north of Jupiter and was not considered a reasonable connection for local passenger services but could represent a viable connection for freight and Amtrak trains traveling to and from Jacksonville. Option 2 via Canal C-17 would require relocating two passenger stations (Blue Heron Road and Northlakes Boulevard in Riviera Beach) from sites proposed on the FEC alignment by other Service Segment 1 and 2 alternatives.

[1] Actual track construction is limited to a new connection between the FEC and CSXT at Marcy.

[2] Actual new track construction is limited to an 800 foot connecting track. The length of the connection is 1.7 miles.

Based on the analysis of the alignment options, including sensitivity to adjacent land uses and minimum required design criteria, three of the potential north end connections identified between the FEC and SFRC appear to warrant further investigation in Tier 2:

- **Option 2C—Canal C-17 Frontage:** The alignment generally follows Canal C-17 from CSXT at Milepost SX 965.3, one mile north of Mangonia Park and west of Congress Avenue, to FEC Milepost 291.8 (near Lighthouse Drive) or Milepost 292.5 (north of Silver Beach Road and near Park Avenue), near the Lake Park. This option offers a reasonably unencumbered and direct connection between the two main lines suitable for freight, Amtrak and possible Service Segment 1 RGR trains, assuming no insurmountable environmental and community issues are identified in subsequent, more detailed analysis.

- **Option 3B—Florida Power & Light Alignment at Riviera Beach:** Option 3B would connect the SFRC and the FEC in the vicinity of the existing Lewis Terminals Connector (also known as "Mission Spur" or the "Riviera Beach Connection"). The FP&L Option would create a new east-west connector within a 200 feet wide FP&L right-of-way. This option offers a relatively short connection between the two main lines suitable for freight, Amtrak and possible Service Segment 1 RGR trains, albeit at the expense of operating performance through two restrictive curves. Use of the existing utility right-of-way would have minimal impacts on surrounding land uses, assuming no insurmountable environmental and community issues are identified in subsequent, more detailed analysis.

- **Option 5A—Waterworks Connection:** Option 5A would connect the SFRC and the FEC immediately north of West Palm Beach Station following the alignment of the former FEC Waterworks Spur on the north side of Banyan Boulevard. Option 5A (Waterworks Connection) takes advantage of the former freight siding connecting the Palm Beach Water Works to the FEC mainline at Milepost 299.2. This option offers the shortest connection (0.5 mile) with minimal impacts, albeit at low operating speed. It would be suitable for possible Service Segment 2 BRT, LRT and RGR services and possibly for Amtrak trains, but would not be suitable for regular use by freight trains, assuming no insurmountable environmental and community issues are identified in subsequent, more detailed analysis.

More detailed information regarding the analysis for the north end connections between the two corridors is discussed in the technical memorandum, “SFECCTA Study North End Railroad Connection Alignments”, which is available upon request.

2.2.5. Service Segment 1 – West Palm Beach North

This service segment addresses potential end-on extensions of the existing Tri-Rail service northward in Palm Beach County paralleling the FEC alignment. Service could be provided through a direct extension of Tri-Rail trains, or indirectly via transfer to an alternate form of regional rail, light rail transit, bus rapid transit or regional bus. Service is focused on Tequesta, Jupiter, Riviera Beach and (through existing Tri-Rail service) West Palm Beach. **(Table 2.2** and **Figure 2.8)**

Table 2.2: Service Segment 1 Description

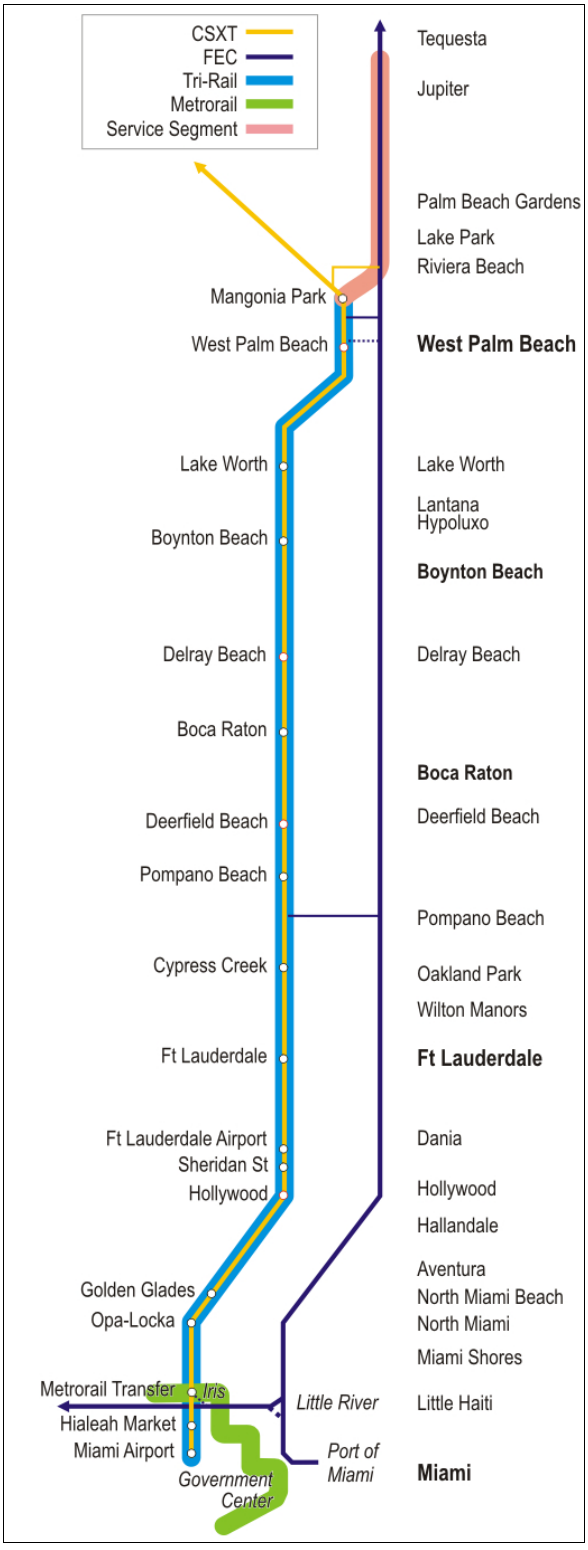
West Palm Beach North	
Focus	Mangonia Park Station
End Point(s)	Tequesta
Intermediate Markets	Jupiter, Palm Beach Gardens, Riviera Beach, North Palm Beach, Lake Park
Extent	15.8 Miles
Potential Modes	RGR, BRT, LRT, RGB
Possible Alignments	FEC, US-1, I-95

Table 2.3 provides demographic data regarding the service segment in comparison to the study area as a whole. This segment is lower than the SFECC average with respect to minority, low income and no vehicle households, but higher than average with respect to population under 15 or over 65 years old.

Table 2.3: Service Segment 1 Characteristics

	SFECCTA Study Area		**Service Segment 1**	
Length	85.3 Miles		15.8 Miles	
	Total	**Per Mile**	**Total**	**Per Mile**
Population	1,180,818	13,843	130,367	8,251
Under 15 or Over 65	24%		27%	
Employment	750,914	8,803	92,307	5,842
Households	474,722	5,565	51,826	3,280
Minority	15%		10%	
Low-income	19%		15%	
No-vehicle HHs	10%		6%	

Figure 2.8: Service Segment 1 – West Palm Beach North



2.2.6. Service Segment 2 – North Palm Beach County

This service segment (**Table 2.4** and **Figure 2.9**) would extend north and south from a connection with Tri-Rail at West Palm Beach, providing Northern Palm Beach County communities with a local, line haul transit service. The service would parallel US-1 and complement the heavily-patronized local bus service Palm Tran operates on that arterial. It would also provide feeder service to Tri-Rail via a transfer from the north and, to a lesser degree, from the south.

Table 2.4: Service Segment 2 Description

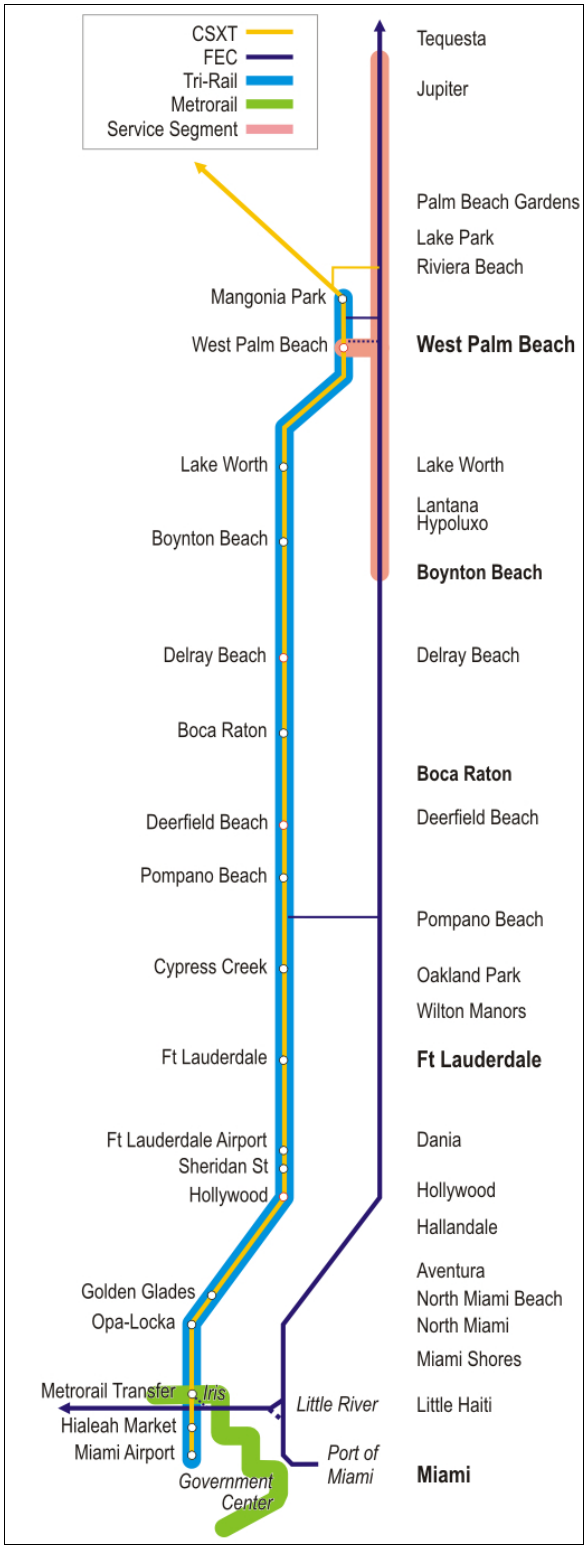
North Palm Beach County	
Focus	West Palm Beach CBD
End Point(s)	Tequesta (North) Boynton Beach (South
Intermediate Markets	Jupiter, Palm Beach Gardens, Riviera Beach, North Palm Beach, Lake Park, Lake Worth, Lantana, Hypoluxo
Extent	35.9 Miles
Potential Modes	RGR, BRT, LRT
Possible Alignments	FEC, US-1

Table 2.5 provides demographic data regarding the service segment in comparison to the study area as a whole. This segment is lower than the SFECC average with respect to low income and no vehicle households, but about on par with the average for minority households and higher than average with respect to population under 15 or over 65.

Table 2.5: Service Segment 2 Characteristics

	SFECCTA Study Area		**Segment 2**	
Length	85.3 Miles		35.9 Miles	
	Total	**Per Mile**	**Total**	**Per Mile**
Population	1,180,818	13,843	348,477	9,707
Under 15 or Over 65	24%		27%	
Employment	750,914	8,803	221,396	6,147
Households	474,722	5,565	140,096	3,902
Minority	15%		14%	
Low-income	19%		16%	
No-vehicle HHs	10%		8%	

Figure 2.9: Service Segment 2 – North Palm Beach County



2.2.7. Service Segment 3 – West Palm Beach South

This service segment (**Table 2.6** and **Figure 2.10**) would extend south from a connection with Tri-Rail at West Palm Beach to another connection with Tri-Rail at or near Pompano Beach, providing South Palm Beach County and some North Broward County communities with a local, line haul transit service. The service would parallel to US-1 and complement the heavily-patronized local bus service Palm Tran operates on that arterial. It would also provide a bridge service connecting the commercial centers of these to Tri-Rail stations from the south.

Table 2.6: Service Segment 3 Description

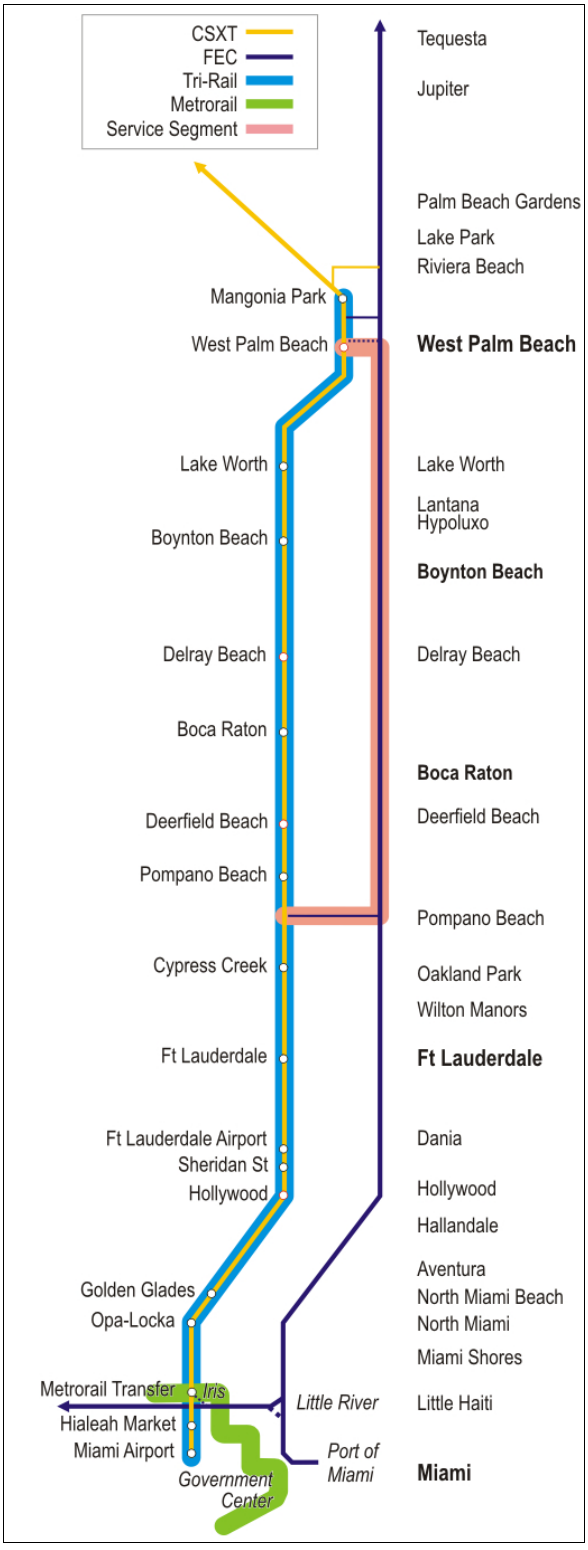
West Palm Beach South	
Focus	West Palm Beach CBD
End Point(s)	Pompano Beach
Intermediate Markets	Lake Worth, Lantana, Hypoluxo, Boynton Beach, Delray Beach, Villa Roca, Yamato, Boca Raton, Deerfield Beach
Extent	33.0 Miles
Potential Modes	RGR, BRT, LRT
Possible Alignments	FEC, US-1

Table 2.7 provides demographic data regarding the service segment in comparison to the study area as a whole. This segment is lower than the SFECC average with respect to low income and no vehicle households, but about on par with the average for minority households and higher than average with respect to population under 15 or over 65.

Table 2.7: Service Segment 3 Characteristics

	SFECCTA Study Area		**Segment 3**	
Length	85.3 Miles		33.0 Miles	
	Total	**Per Mile**	**Total**	**Per Mile**
Population	1,180,818	13,843	378,970	11,484
Under 15 or Over 65	24%		27%	
Employment	750,914	8,803	225,445	6,832
Households	474,722	5,565	153,857	4,662
Minority	15%		16%	
Low-income	19%		17%	
No-vehicle HHs	10%		8%	

Figure 2.10: Service Segment 3 – West Palm Beach South



2.2.8. Service Segment 4 – East Broward County

This service segment (**Table 2.8** and **Figure 2.11**) would extend south from a connection with Tri-Rail at or near Pompano Beach, providing Broward County communities with a local, line haul transit service. The service would parallel to US-1 and complement the heavily-patronized local bus service Broward County Transit operates on that arterial. It would also provide a feeder service connecting the commercial centers of these to Tri-Rail stations to the north.

Table 2.8: Service Segment 4 Description

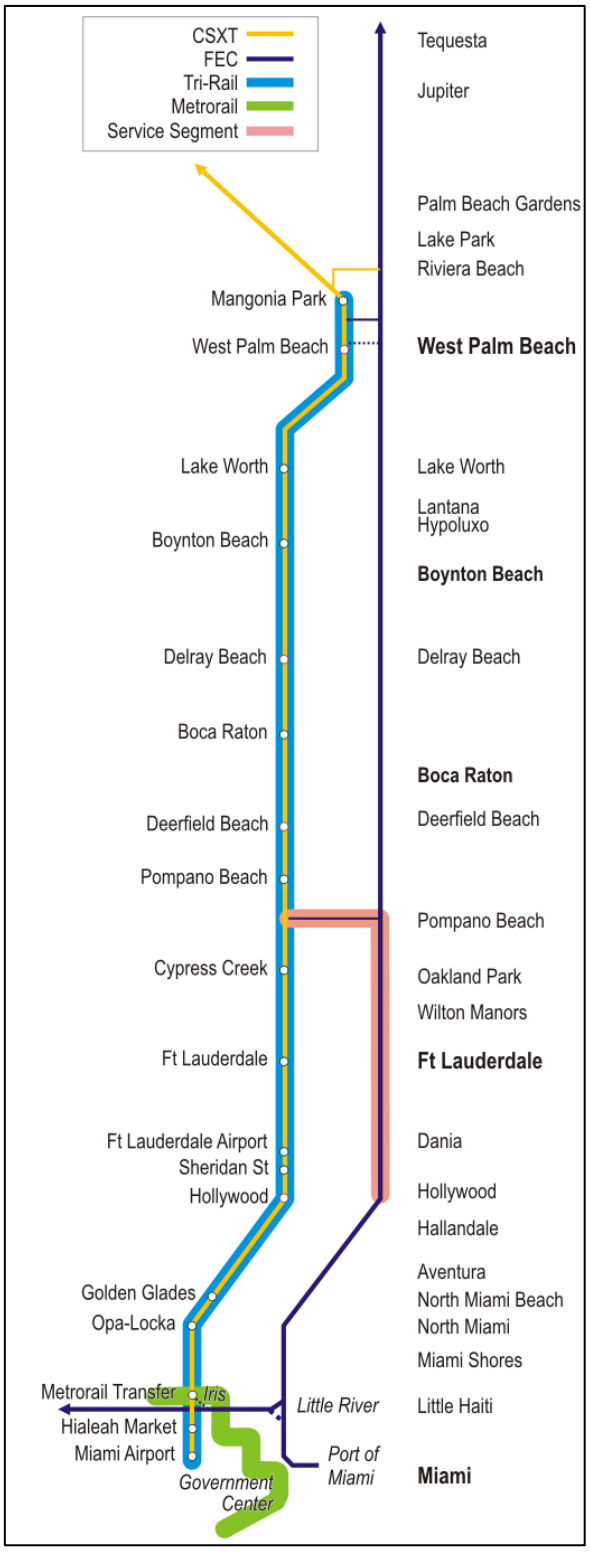
East Broward County	
Focus	Fort Lauderdale CBD
End Point(s)	Pompano Beach (North), Hollywood (South)
Intermediate Markets	Oakland Park, Colohatchee, Wilton Manors, FLL Airport, Port Laudania, Dania
Extent	16.7 Miles
Potential Modes	RGR, BRT, LRT
Possible Alignments	FEC, US-1

Table 2.9 provides demographic data regarding the service segment in comparison to the study area as a whole. This segment is about on par with the SFECC average with respect to minority, low income and no vehicle households, but less than average with respect to population under 15 or over 65.

Table 2.9: Service Segment 4 Characteristics

	SFECCTA Study Area		Segment 4	
Length	85.3 Miles		16.7 Miles	
	Total	**Per Mile**	**Total**	**Per Mile**
Population	1,180,818	13,843	307,309	18,402
Under 15 or Over 65	24%		22%	
Employment	750,914	8,803	164,701	9,862
Households	474,722	5,565	132,928	7,960
Minority	15%		14%	
Low-income	19%		19%	
No-vehicle HHs	10%		9%	

Figure 2.11: Service Segment 4 – East Broward County



2.2.9. Service Segment 5 – Fort Lauderdale-Miami

This service segment (**Table 2.10** and **Figure 2.12**) would extend south from a connection with Tri-Rail at or near Pompano Beach, providing Broward County and North Miami-Dade County communities with a local, line haul transit service. The service would parallel to US-1 and complement the heavily-patronized local bus services Broward County Transit and Miami-Dade Transit operate on that arterial. It would also provide a feeder service connecting the commercial centers of these to Tri-Rail stations to the north. There are several ways service could operate in this segment. For example, Tri-Rail trains could be rerouted to the FEC at Pompano Beach, providing a one-seat ride from stations to the north to Downtown Fort Lauderdale and Miami (a new Pompano Beach-MIA Airport train on the SFRC would maintain existing service south of the connection).

Table 2.10: Service Segment 5 Description

Fort Lauderdale – Miami	
Focus	Fort Lauderdale CBD, Miami CBD
End Point(s)	Pompano Beach (North), Government Center (South)
Intermediate Markets	Oakland Park, Colohatchee, Wilton Manors, FLL Airport, Port Laudania, Dania, Hollywood, Hallandale, Ojus, North Miami Beach, North Miami, Miami Shores, Biscayne, Little River, Little Haiti, Lemon City
Extent	33.8 Miles
Potential Modes	RRT, RGR, BRT, LRT
Possible Alignments	FEC, US-1

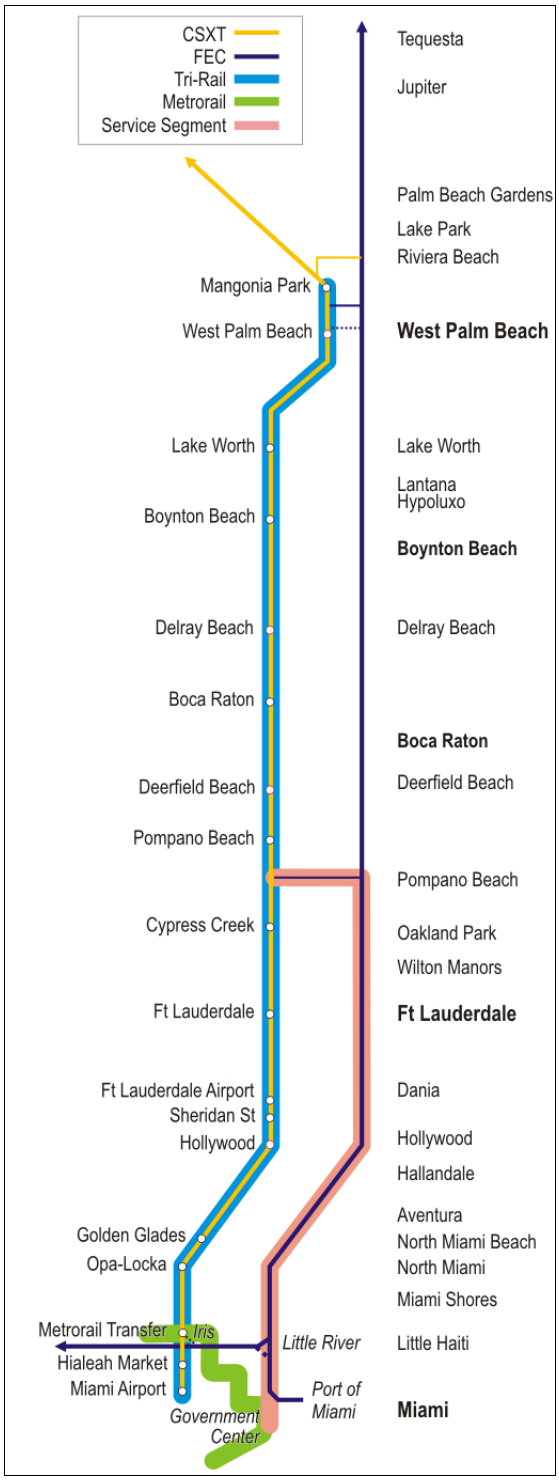
Table 2.11 provides demographic data regarding the service segment in comparison to the study area as a whole.

Table 2.11: Service Segment 5 Characteristics

	SFECCTA Study Area		**Segment 5**	
Length	85.3 Miles		33.8 Miles	
	Total	**Per Mile**	**Total**	**Per Mile**
Population	1,180,818	13,843	680,026	20,119
Under 15 or Over 65	24%		22%	
Employment	750,914	8,803	436,268	12,907
Households	474,722	5,565	270,300	7,997
Minority	15%		15%	
Low-income	19%		21%	
No-vehicle HHs	10%		11%	

This segment is about on par with the SFECC average with respect to minority and no vehicle households, but greater than average with respect to low-income households and less than average with respect to population under 15 or over 65.

Figure 2.12: Service Segment 5 – Fort Lauderdale - Miami



2.2.10. Service Segment 6 – Miami Northeast

This service segment (**Table 2.12** and **Figure 2.13**) would extend north from Government Center in Downtown Miami to Hallandale, providing North Miami-Dade County and some South Broward County communities with a local, line haul transit service. The service would parallel to US-1 and complement the heavily-patronized local bus service Miami-Dade Transit operates on that arterial.

Table 2.12: Service Segment 6 Description

Miami Northeast	
Focus	Miami CBD
End Point(s)	Hallandale
Intermediate Markets	Ojus, North Miami Beach, North Miami, Miami Shores, Biscayne, Little River, Little Haiti, Lemon City
Extent	14.4 Miles
Potential Modes	RRT, RGR, BRT, LRT
Possible Alignments	FEC, US-1

Table 2.13 provides demographic data regarding the service segment in comparison to the study area as a whole. This segment is greater than the SFECC average with respect to minority, low income and no vehicle households but less than average with respect to population under 15 or over 65.

Table 2.13: Service Segment 6 Characteristics

	SFECCTA Study Area		**Segment 6**	
Length	85.3 Miles		14.4 Miles	
	Total	**Per Mile**	**Total**	**Per Mile**
Population	1,180,818	13,843	351,665	24,421
Under 15 or Over 65	24%		22%	
Employment	750,914	8,803	264,858	18,393
Households	474,722	5,565	128,107	8,896
Minority	15%		17%	
Low-income	19%		23%	
No-vehicle HHs	10%		14%	

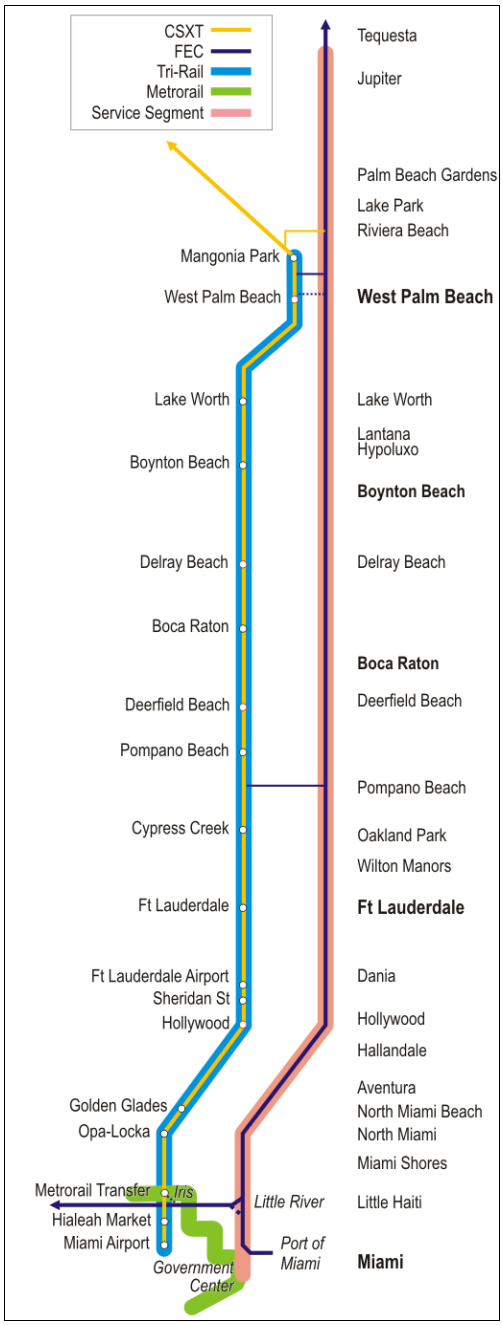
In addition to the six service segments, three Special Analysis Segments were defined to support analysis of overall corridor phenomena. Special Analysis Segments 7, 8 and 9 differ from the prior six subregional service segments in that:

- They span the full extent of the corridor;

- They consider a single modal technology (RGR) and alignment (FEC); and
- They are not intended to represent an actual service configuration or alternative.

Their purpose is to aid analysis by providing a consistent basis of comparison through which to better understand what would happen if the corridor was subdivided into a different set of subregional combinations, or the effect of different Miami-Dade County termini (Downtown Miami versus MIA Airport).

Figure 2.13: Service Segment 6 – Miami Northeast



Additional analysis was conducted assuming a regional rail technology along the entire FEC Railway alignment (Service Segment 7,8 & 9) for comparison purposes to the different segments and to test the effect of different Miami-Dade County termini (Downtown Miami versus the MIC). The additional analysis also included testing the effect of extending Tri Rail service to Downtown Miami. This analysis was useful in determining the ultimate segmentation for the corridor as discussed in Chapters 4 and 6.

2.3. Definition of Alternatives

Based on the preceding analysis, a series of build alternatives were developed and analyzed based on the six service segments, as well as the No Build and Transportation System Management (TSM) Alternative. These alternatives are further defined below.

2.3.1. No-Build (No Action) Alternative

A "No Build" or "No Action" Alternative is required for any FTA sanctioned EIS. It reflects projects included in the 2030 Long Range Cost Feasible Plans for each of the counties. The 2030 Plans include enhanced Tri-Rail service as a result of the double tracking to 48 trains per day with 20 minute headways in the peak hour and 60 minute headways in the non-peak. This service is planned to connect to the MDT Metrorail service at the MIC which is currently under construction near MIA. Tri-Rail currently generates about 10,000 daily boardings in the SFECC study area. Metrorail services accounts for about another 59,000 daily boardings (including stations south of the study area.) Bus services are also an important element of the No Build—the 80 local bus routes operated by MDT, BCT and Palm Tran generate about 275,000 weekday boardings. Roadway improvements along US-1 or other parallel alignments is limited in the 2030 Plans. Only Palm Beach County has any improvements planned for the US-1 corridor (4 to 6 lanes) and Dixie Highway (2 to 4 lanes).

2.3.2. Transportation System Management (TSM)/Baseline Alternative

FTA defines the TSM Alternative to be the “best that can be done” to improve transit service in the corridor without major capital investment in new infrastructure. The TSM Alternative for this project will be to add cost-effective transit improvements beyond the adopted long-range plan. These improvements will include the following:

- Increasing Tri-Rail service frequencies (15 minute peak headways, 30 minute off-peak)
- Improving service frequencies on 21 bus routes that serve the three county area and were part of the on-board transit survey. The routes operate in a north-south direction and are located within five miles of the corridor surveyed. The routes are Palm Tran 1,2,3,20, 21, and 70; BCT 1,6,10,20,50,60 and

MDT 2,3,9,10,16,93,95. Many of these routes have 30 minute headways that can be reduced and modeled at 15 minutes for the TSM alternative.

The TSM Alternative will be further refined and analyzed during Tier 2.

2.3.3. Build Alternatives

The Build Alternatives consist of a set of travel modes and routes within the study area. They are evaluated in service segments to better focus on the application of the mode and route. They consist of six distinct service segments, based on forecasted 2030 travel patterns reflecting the "desire lines" described previously. Three additional special analysis segments encompassing the overall extent of the corridor were also created to validate choices about service segment boundaries and to test the relative potential of differing southern termini (Downtown Miami vs. MIA).

Based on the preceding analysis of service segments, a total of 40 alternatives were initially identified in the study area. This number was winnowed down to 36 preliminary alternatives for further consideration in the SFECCTA study area, as summarized in **Table 2.14** based on a cursory review of alignment demographics, future employment center development, and comments received from the public and key stakeholders. Each preliminary alternative was given a three-part designator indicating its context in terms of service segment and modal technology. The preliminary alternatives include one pair of sub-alternatives for the Tri-Rail alternative on the FEC alignment (1RGR1 and 1RGR1A). More detailed physical descriptions for the initial and preliminary alternatives can be found in the technical memorandum, “SFECCTA Study Alternatives Development”, which is available upon request.

Regional rail (RGR) on the FEC alignment—whether Tri-Rail or some other FRA compliant or non-compliant vehicle—was represented as a technology option for at least one alternative in every service segment. Alternatives associated with the two semi-rapid transit modes—bus rapid transit (BRT) and light rail transit (LRT)—are incorporated into the greatest number of alternatives (24), proposed for consideration on the FEC right-of-way as well as integrated into US-1.

Two rail rapid transit (RRT) alternatives were proposed at the south end of the SFECCTA study area, where economies of scale can be achieved through integration with the existing Metrorail system. Regional bus (RGR) was only considered as a "rubber-tired extension" of Tri-Rail service via I-95 north of the present terminal station at Mangonia Park.

Table 2.14: SFECCTA Preliminary Alternatives

Service Segment	Alignment	Regional Bus	Bus Rapid Transit	Light Rail Transit	Rail Rapid Transit	Regional Rail	
						Tri-Rail	Other RGR
1 West Palm Beach North	FEC		1BRT2A	1LRT2A		1RGR1/1A	
	US1	1RGB2	1BRT1	1LRT1			
	I-95	1RGB1				1RGR2	
2 North Palm Beach County	FEC		2BRT2	2LRT2			2RGR1
	US1		2BRT1	2LRT1			
3 West Palm Beach South	FEC		3BRT2	3LRT2			3RGR1
	US1		3BRT1	3LRT1			
4 East Broward County	FEC		4BRT2	4LRT2			4RGR1
	US1		4BRT1	4LRT1			
5 Ft Lauderdale – Miami	FEC		5BRT2	5LRT2	5RRT1		5RGR1
	US1		5BRT1	5LRT1			
6 Miami Northeast	FEC		6BRT2	6LRT2	6RRT1		6RGR1
	US1		6BRT1	6LRT1			
	Technology:	RGB	BRT	LRT	RRT	RGR	

2.3.4. Initial Station Suitability and Location Screening

Potential station locations were identified for each of the build alternatives for modeling purposes. The selection of passenger station locations in the SFECCTA study area are heavily dependent upon the choices that will eventually be made concerning alignment and modal technology to address a specific service need. At the Tier 1 stage of project definition, there are many functional elements regarding station area location that can be considered independent and in advance of making specific modal decisions.

A number of factors influence the specific siting of stations, including:

- Passenger catchment areas ("commutersheds")
- Local street network
- Local pedestrian network
- Adjacent land uses
- Accessibility
- Visibility

- Availability and cost of real estate

The location and suitability of stations were considered as sequential steps in alternatives development. The general locations where stations would be considered desirable were selected for each SFECCTA alignment based on the following:

- **East-West Arterials:** The ease of access to communities east and west of the station sites was considered an important priority in station siting. As such, many station areas were centered on or near alignment intersections with major east-west arterials.
- **Town Centers:** A priority was afforded to reinforcing the regional significance of the commercial districts and potentially historic town centers of SFECCTA communities through the siting of station areas.
- **Residential Densities:** The spacing of sequential station areas along a given alignment generally reflected the residential density of adjacent development, applying closer station spacing in areas of higher residential densities where pedestrian access may be more predominant, and broader station spacing in areas of lower residential density.
- **Intermodal Transfer Centers:** Connectivity with other transport modes and services were another priority in the siting of station areas. Candidate intermodal transfer centers included local transit hubs, train stations, airports and seaports.

Initially, 61 station areas were identified in this manner, as illustrated in **Figure 2.14** and itemized on **Table 2.15**. Comparable Equivalent station areas were identified centered on the alignment of the FEC, US-1 and I-95. **Figure 2.18 – Figure 2.21** at the end of this chapter provide graphical information regarding each alignment and its associated station areas.

Figure 2.14: Alternative Alignments and Station Areas by Service Segment

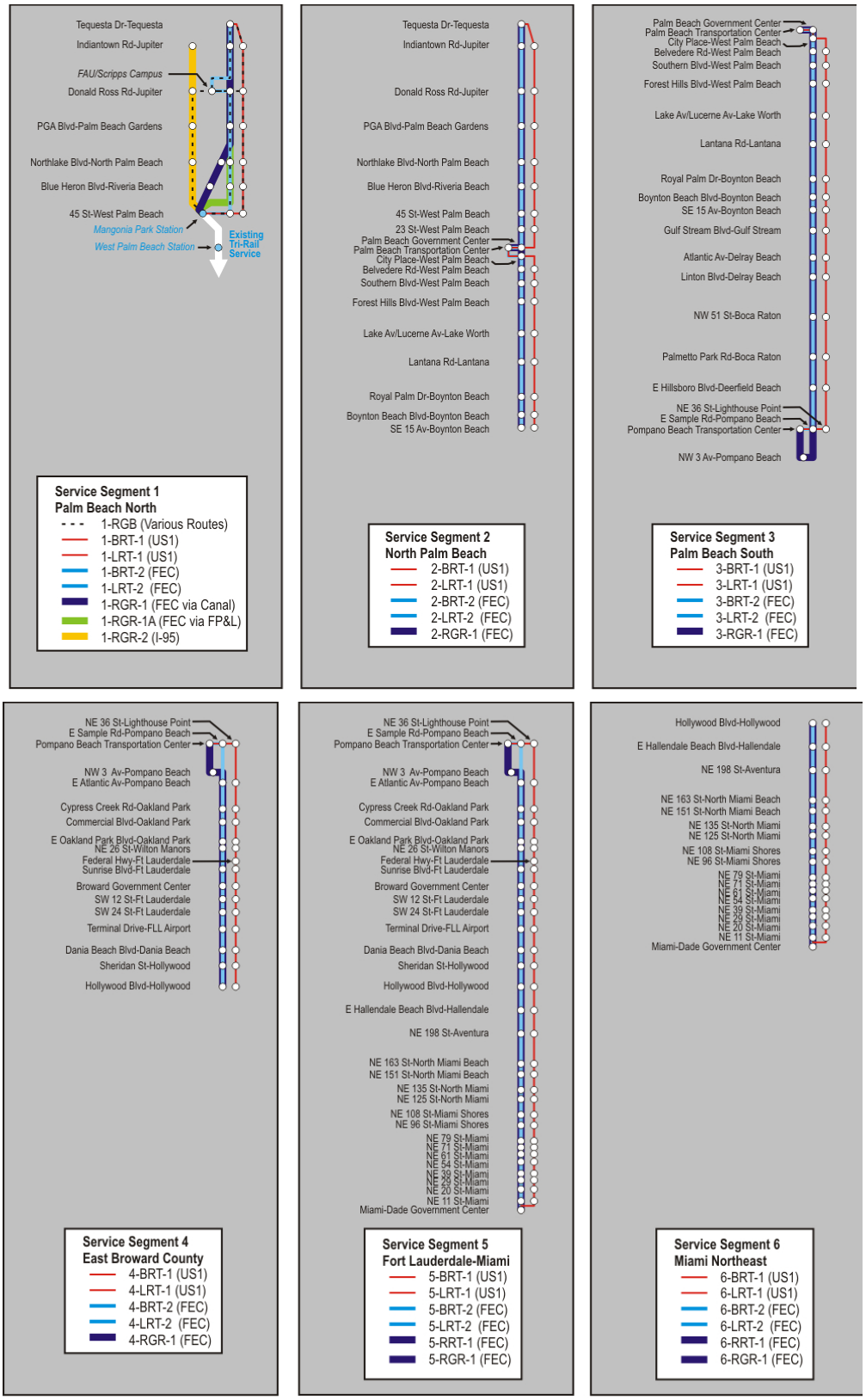


Table 2.15: Station Area Centroids by Service Segment

	Station Area Centroid	Service Segment					
		1	2	3	4	5	6
1	Tequesta Dr-Tequesta	■	■				
2	Indiantown Rd-Jupiter	■	■				
3	Donald Ross Rd-Jupiter	■	■				
4	PGA Blvd-Palm Beach Gardens	■	■				
5	Northlake Blvd-North Palm Beach	■	■				
6	Blue Heron Blvd-Riveria Beach	■	■				
7	Mangonia Park Station	■					
	45 St-West Palm Beach		■				
8	23 St-West Palm Beach		■				
9	Palm Beach Lakes Blvd-West Palm Beach		■				
10	Palm Beach Government Center		■	■			
11	West Palm Beach Transportation Center		■	■			
12	City Place -West Palm Beach		■	■			
13	Belvedere Rd-West Palm Beach		■	■			
14	Southern Blvd-West Palm Beach		■	■			
15	Forest Hill Blvd-West Palm Beach		■	■			
16	Lake Av Lucerne Av-Lake Worth		■	■			
17	Lantana Rd-Lantana		■	■			
18	Royal Palm Dr-Boynton Beach		■	■			
19	Boynton Beach Blvd-Boynton Beach		■	■			
20	SE 15 Av-Boynton Beach		■	■			
21	Gulfstream Blvd-Gulf Stream			■			
22	Atlantic Av-Delray Beach			■			
23	Linton Blvd-Delray Beach			■			
24	NW 51 St-Boca Raton			■			
25	Palmetto Park Rd-Boca Raton			■			
26	E Hillsboro Blvd-Deerfield Beach			■			
27	E Sample Rd-Pompano Beach			■	■	■	
28	NE 36 St-Lighthouse Point			■	■	■	
29	NW 3 Av-Pompano Beach			■	■	■	
30	Pompano Beach Transportation Center			■	■	■	

	Station Area Centroid	Service Segment					
		1	2	3	4	5	6
31	E Atlantic Blvd-Pompano Beach				■	■	
32	Cypress Creek Rd-Oakland Park				■	■	
33	Commercial Blvd-Oakland Park				■	■	
34	NE 38 St-Oakland Park				■	■	
35	NE 26 St-Wilton Manors				■	■	
36	Federal Hwy-Fort Lauderdale				■	■	
37	Sunrise Blvd-Fort Lauderdale				■	■	
38	Broward Government Center				■	■	
39	SW 12 St-Fort Lauderdale				■	■	
40	SW 24 St-Fort Lauderdale				■	■	
41	Terminal Drive-Unincorporated				■	■	
42	Dania Beach Blvd-Dania Beach				■	■	
43	Sheridan St-Hollywood				■	■	
44	Hollywood Blvd-Hollywood				■	■	■
45	E Hallandale Beach Blvd-Hallendale					■	■
46	NE 198 St-Aventura					■	■
47	NE 163 St-North Miami Beach					■	■
48	NE 151 St-North Miami Beach					■	■
49	NE 135 St-North Miami					■	■
50	NE 125 St-North Miami					■	■
51	NE 107 St-Miami Shores					■	■
52	NE 96 St-Miami Shores					■	■
53	NE 79 St-Miami					■	■
54	NE 71 St-Miami					■	■
55	NE 61 St-Miami					■	■
56	NE 54 St-Miami					■	■
57	NE 39 St-Miami					■	■
58	NE 29 St-Miami					■	■
59	NE 20 St-Miami					■	■
60	NE 11 St-Miami					■	■
61	Miami-Dade Government Center					■	■

2.3.5. Land Use Suitability

The following parameters and variables, based on FTA criteria, were analyzed to determine whether particular areas were suitable for transit and associated TOD. Each element was mapped and overlaid into a final GIS map that represents station suitability (**Figure 2.15**). The major parameters and variables are further represented in **Table 2.17**.

- **Transit Supportive Land Use:** To assess transit supportive land use within each municipality in the SFECCTA study area, existing policies and guidelines in place at the zoning stage that would encourage more density, mixed use, and a pedestrian atmosphere were analyzed. **Table 2.16** provides a matrix outlining the strength of their transit supportive policies. In addition, the origination variable consists of housing density and the destination variable consists of employment density.

Table 2.16: Transit Suitability of the Cities in the Corridor

	Transit Supportive with Policies and/or Implementation	Transit Supportive but no Policies and/or Implementation	Not Transit-Supportive	More Information Needed
Palm Beach County	Delray Beach West Palm Beach	Boca Raton Boynton Beach Lantana Lake Worth Riviera Beach Lake Park North Palm Beach Palm Beach Gardens Jupiter		Mangonia Park Tequesta
Broward County	Hollywood Fort Lauderdale Wilton Manors Oakland Park Deerfield Beach	Hallandale Dania Beach Lighthouse Point		
Miami-Dade County	Miami North Miami	El Portal Miami Shores North Miami Beach Aventura		Biscayne Park

- **Development Patterns:** Development patterns are the primary focus and criteria in TOD. These patterns cover an examination of the existing land use and development by taking a look at the mix of uses and whether the conglomerate of the patterns creates a center where ridership can either originate or terminate as a destination. Patterns of land use and development also cover economic development initiatives within municipalities. Economic development initiatives engage a wide range of "techniques" such as the designation of CRAs, local activity centers (LACs), empowerment zones, and a host of others. These initiatives often provide for focused redevelopment efforts with funding sources or mechanisms that help encourage development. The most effective areas are those that focus their economic and redevelopment efforts around or in anticipation of encouraging greater transit mobility. The variables included with this parameter are financial catalysts such as CRA's and brownfields, economic catalysts such as LAC's and overlay districts and, development trends which consists of housing growth and commercial growth.

- **Connectivity:** As learned from the development of the Tri-Rail commuter rail system in South Florida, an essential component of a north-south transit line is its east-west connections and accessibility through other modes, be it vehicular or pedestrian. The South Florida metropolitan corridor runs in a general north-south pattern due to development limitations of the Florida Everglades. Therefore, the second major category of criteria evolves from the location and proximity of these east-west connectors and other modes of transit to the proposed station location. With the presence of I-95 as a major north-south regional connector, major east-west connectors connecting to I-95 generally have greater carrying capacity and also provide connectivity to municipalities and neighborhoods west of I-95. Increased suitability is also derived from the presence and connections of other forms of transit such as local/regional bus systems, and proximity to Tri-Rail/Amtrak stations that offer long-range commuter

and regional transit connectivity. The variables relating to this parameter are auto connectivity and transit connectivity.

- **Station Area Environment:** The final tier of suitability mapping is derived from a more qualitative and often elusive element. In growth factors trying to substantiate and qualify the quality of the station area environment, four major sub-categories emerge: Form, Density, the Public Realm, and finally Transit Need and Dependency. Form and Density work hand in hand to identify a critical mass that would validate a transit station area. A critical evaluation of the built form, its application and function, and density provides further insight into this category. Basic infrastructure improvements provide each city with a basis for validating the City's dedication towards public service and progress. Municipalities in the SFECC range from those that look at a level of maintenance and no growth to those that progressively seek evolution and improvements to the public realm by enhancing the "quality of living" for its residents. Although, the "Public Realm" category overlaps economic development initiatives, it specifically seeks out the presence and proximity of recreational, civic, institutional and cultural facilities that are built and maintained as amenities for the use and enjoyment of the public. The final criterion seeks a demographic need and dependency on transit. By establishing a basic need for transit through the identification of zero-vehicle ownership homes and low-income/affordable homes that would depend on and/or generally benefit from the availability of other modes of transit, an integral piece of the suitability methodology is identified. Not only do these criterions identify a critical mass of users, but also identify a group of users that would profit most from transit access. The variables measuring this parameter include growth capacity based on maximum building height and major attractors such as hospitals, colleges, and presence of low income households.

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Figure 2.15: Station Land Use Suitability Analysis

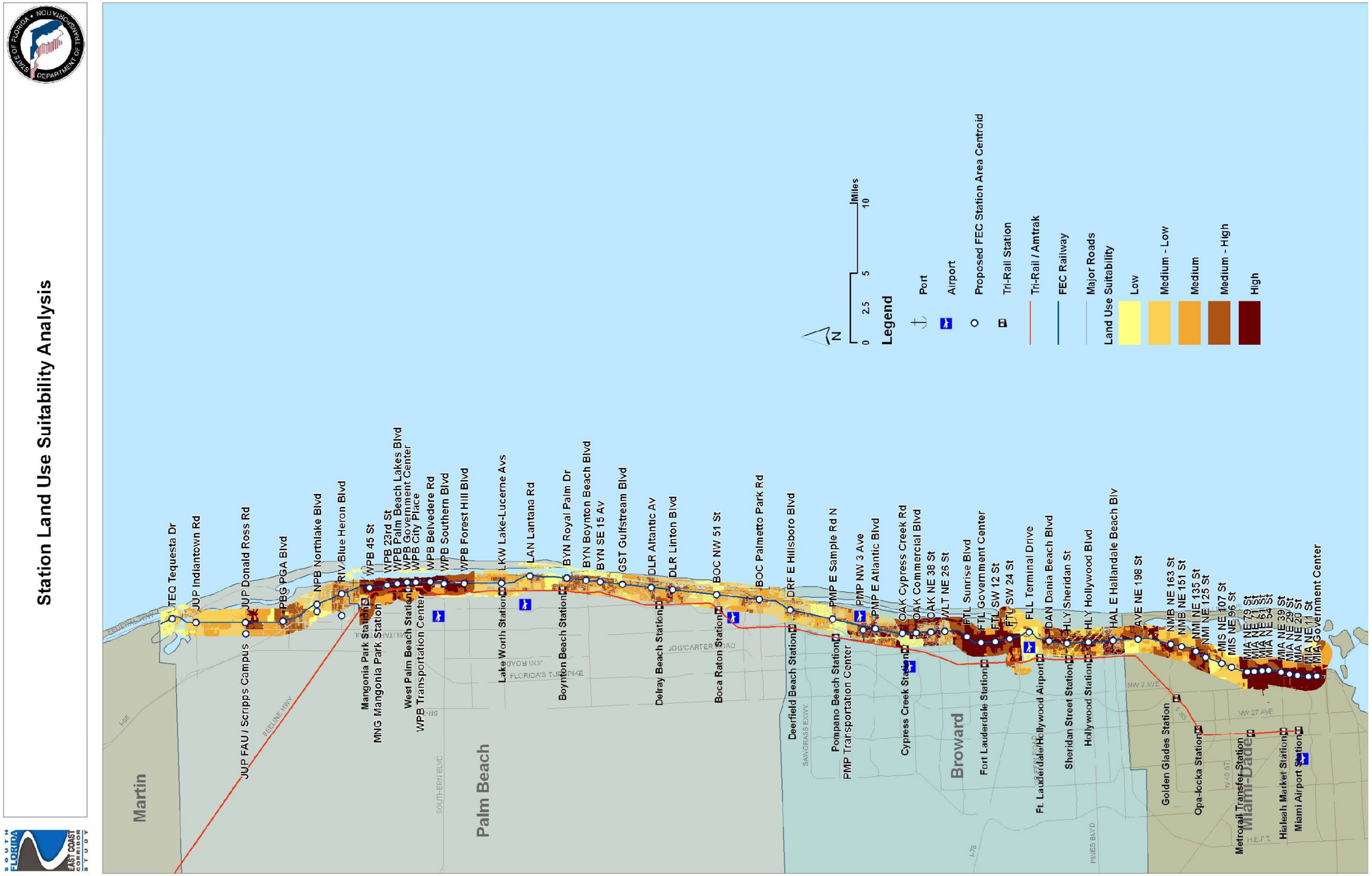

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Table 2.17: Station Land Use Suitability

	Transit Supportive Land Use			Development Patterns		Connectivity		Station Area Growth Factors			Town & Comm Suitability (Total)
Station	Origination	Destination	Transit-support Policy	Catalysts	Dev Trends	Auto Connectivity	Tran Connectivity	Growth Capacity	Attractors	Transit Dependent	
TEQ Tequesta Dr	2.83	1.11	1.11	1.00	4.01	1.45	1.00	1.83	2.24	1.70	1.86
JUP Indiantown Rd	1.39	2.99	2.99	1.00	4.99	1.36	1.00	2.21	1.56	1.46	2.08
JUP Donald Ross Rd	2.66	2.96	4.62	1.38	4.92	2.43	1.00	1.11	1.02	1.04	2.39
FAU / Scripps Campus	1.11	2.94	3.23	1.00	4.87	1.00	1.00	1.11	1.00	1.00	1.79
PBG PGA Blvd	3.00	3.00	5.00	1.10	5.00	2.00	1.00	1.00	1.70	1.05	2.45
NPB Northlake Blvd (C17)	1.00	2.62	4.08	1.18	4.01	1.00	1.18	1.78	1.15	2.00	1.97
NPB Northlake Blvd	1.03	2.32	2.61	1.19	2.20	1.47	2.40	1.70	1.64	1.80	1.80
RIV Blue Heron Blvd (C17)	1.00	2.00	1.00	1.00	2.50	1.00	3.00	1.00	1.00	2.33	1.55
RIV Blue Heron Blvd	1.84	2.97	2.97	1.00	4.26	1.36	2.94	2.08	1.75	2.73	2.42
MNG Mangonia Park Station	1.00	5.00	1.00	2.00	1.75	1.00	4.53	1.00	2.00	1.00	1.99
WPB 45 St	1.30	5.00	5.00	1.20	4.25	3.00	1.80	2.00	2.60	2.00	2.83
WPB 23 St	1.91	4.45	4.45	1.76	3.74	2.12	1.97	2.02	1.74	2.17	2.63
WPB Transportation Center	1.00	4.04	4.04	1.48	3.35	2.28	3.32	1.24	1.48	2.40	2.55
WPB Government Center	1.00	3.74	3.74	1.95	3.07	3.32	3.00	1.00	1.37	1.84	2.53
WPB Palm Beach Lakes Blvd	1.84	5.00	5.00	1.89	4.25	2.96	1.62	1.78	1.49	2.00	2.81
WPB City Place	1.13	3.92	3.92	1.69	3.23	3.33	3.00	1.44	1.25	1.81	2.58
WPB Belvedere Rd	2.50	5.00	5.00	1.47	4.25	2.75	1.81	1.97	1.88	2.47	2.90
WPB Southern Blvd	2.59	5.00	5.00	1.31	4.25	2.22	1.98	2.24	1.93	2.54	2.89
WPB Forest Hills Blvd	1.85	5.00	5.00	1.00	4.25	2.85	2.69	2.31	1.77	2.00	2.89
LAN Lantana Rd	2.49	2.00	3.00	1.00	3.75	1.29	2.99	1.99	2.14	2.00	2.32
BYN Royal Palm Dr	2.26	2.92	2.92	1.00	3.86	1.45	1.00	2.34	1.63	2.89	2.16
BYN Boynyon Beach Blvd	2.02	2.97	2.97	1.00	3.95	1.53	3.00	2.73	1.56	2.59	2.41
BYN SE 15 Av	1.66	2.88	2.88	1.00	3.79	1.38	3.00	2.22	2.05	1.39	2.25
GST Gulfstream Blvd	1.47	2.64	3.15	1.00	3.17	1.00	1.65	1.94	1.16	1.65	1.86
DLR Atlantic Av	4.09	3.00	5.00	1.00	3.25	1.43	3.00	2.78	2.13	1.03	2.52
DLR Linton Blvd	1.29	2.96	4.93	1.00	3.20	1.87	3.00	2.82	1.67	2.29	2.48
BOC NW 51 St	2.07	3.97	2.98	1.00	2.97	2.30	2.35	2.71	1.46	1.79	2.32
BOC Palmetto Park Rd	1.10	3.86	2.90	1.00	2.88	1.55	3.00	2.04	2.42	2.44	2.35
DRF E Hillsboro Blvd	2.26	3.96	4.94	1.00	1.98	1.31	3.00	1.31	2.24	3.77	2.47
LKW Lake Av I Lucerne Av	2.37	1.99	2.98	1.00	2.72	1.19	3.00	2.31	2.48	3.01	2.27
PMP E Sample Rd	1.13	2.80	3.40	1.40	1.55	1.43	3.00	1.45	1.64	2.96	2.00
PMP NW 3 Av	1.92	3.89	4.85	2.93	2.67	1.00	2.99	2.10	2.30	2.70	2.64
PMP Transportation Center	1.00	1.00	1.00	1.00	0.50	1.00	4.83	1.00	3.00	2.00	1.67
PMP E Atlantic Blvd	2.59	4.00	5.00	2.35	2.75	1.29	3.00	3.58	2.53	3.23	2.90
OAK Cypress Creek Rd	1.29	2.28	2.40	1.03	1.33	2.05	3.00	1.71	2.55	2.46	1.99
OAK Commercial Blvd	2.68	4.96	4.96	1.00	2.02	1.40	3.00	3.23	1.64	3.59	2.77
OAK NE 38 St	2.86	4.95	4.95	2.01	1.86	1.14	2.94	1.53	2.01	3.50	2.70
WLT NE 26 St	1.62	3.95	4.94	1.00	1.49	1.00	3.00	1.84	1.79	3.01	2.18
FTL Sunrise Blvd	1.83	5.00	5.00	2.50	3.25	2.67	2.67	4.08	1.83	3.00	3.17
FTL Government Center	3.00	5.00	5.00	4.14	3.25	2.71	3.00	1.86	2.43	3.00	3.35
FTL SW 12 St	2.86	5.00	5.00	2.07	3.25	2.71	3.00	2.93	1.71	2.93	3.10
FTL SW 24 St	2.17	5.00	5.00	1.00	3.25	2.50	2.83	4.08	1.83	3.00	3.00
FLL Terminal Dr	1.00	1.41	1.82	1.00	1.07	1.12	3.00	1.18	1.00	4.00	1.64
DAN Dania Beach Blvd	1.65	3.00	5.00	2.15	3.25	2.00	3.00	2.53	2.20	4.00	2.82
HLY Sheridan St	1.90	2.78	4.56	2.51	2.53	1.55	3.00	2.18	1.78	4.00	2.62
HLY Hollywood Blvd	3.95	2.97	4.93	2.98	2.71	1.42	3.00	2.61	2.27	3.83	2.94
HAL E Hallandale Beach Blvd	2.54	3.99	4.98	1.57	2.49	1.25	3.00	2.63	2.50	3.31	2.68
AVE NE 198 St	1.79	4.79	1.42	1.00	2.71	1.21	2.89	2.37	2.53	1.95	2.17
NMB NE 163 St	1.40	4.33	3.40	1.00	2.30	3.13	3.00	1.80	1.80	2.13	2.49
NMB NE 151 St	1.23	4.23	3.77	1.00	2.00	1.31	2.69	1.31	1.69	1.62	2.11
NMI NE 135 St	1.94	4.67	4.56	1.22	1.76	3.44	2.89	1.06	2.17	3.33	2.71
NMI NE 125 St	2.22	5.00	4.56	1.89	1.83	3.00	2.89	1.06	2.22	4.00	2.85
MIS NE 107 St	1.00	2.50	2.00	1.13	1.50	1.50	2.13	1.13	2.38	3.25	1.78
MIS NE 96 St	1.00	2.00	3.00	1.00	1.50	2.18	2.88	1.00	2.76	2.53	1.97
MIA NE 79 St	3.87	4.80	4.87	1.53	4.30	3.40	3.00	2.60	2.40	3.27	3.37
MIA NE 71 St	3.00	4.77	4.85	1.00	4.27	2.54	3.00	2.77	1.77	3.15	3.09
MIA NE 61 St	3.38	5.00	5.00	1.00	4.50	2.43	3.00	2.14	2.33	2.38	3.09
MIA NE 54 St	3.48	5.00	5.00	1.26	4.50	2.65	2.91	1.83	2.74	2.04	3.12
MIA NE 39 St	2.90	4.73	4.73	1.53	4.23	3.13	2.93	1.63	3.03	2.27	3.12
MIA NE 29 St	4.25	5.00	5.00	1.75	4.50	2.50	3.00	2.75	3.00	2.33	3.35
MIA NE 20 St	3.32	5.00	5.00	2.05	4.50	2.89	3.11	2.68	3.05	1.84	3.35
MIA NE 11 St	3.26	5.00	5.00	2.39	4.50	2.13	4.91	1.43	2.00	2.78	3.40
MIA Government Center	1.73	5.00	5.00	1.82	4.50	1.00	4.82	1.00	2.36	2.55	3.05

Land Use Suitability

- Low
- Medium-Low
- Medium
- Medium-High
- High

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To further substantiate information regarding patterns of development and land use, and potential station area growth factors, economic and market analysis documentation was compiled. This analysis is included below and informed the land use suitability assessment.

2.4. Economic and Market Analysis

The economic analysis undertaken as part of this study had an overall objective to identify opportunities for potential land value capture/enhancement along the SFECCTA study area that could provide potential sources of funding for the initial set of transit initiatives and particularly for potential transit station areas. The following describes the market analysis process.

- Analyze real estate market trends, development patterns, economic development initiatives, Capital Improvement Plans (CIP), and land use policies as they relate to opportunities and constraints for future development in each of the municipalities;
- Identify preliminary market demand for relevant land use typologies so as to inform conceptual development programs;
- Consider each municipality relative to the three-county study corridor in terms of market size, level of density, and projected growth patterns. These characteristics are generally related to specific land uses, including resident households, the industrial employment sector, the commercial employment sector, and the service employment sector. The first three characteristics represent demand drivers for specific land uses. An example would be commercial employment growth generating demand for more office space. Meanwhile, the service employment market represents the byproduct of demand from the other three markets for goods and services. For example, household growth drives increases in total consumer spending, which creates additional demand for retail establishments that in turn need to be staffed by new sales clerks.
- For the analyses presented below, Traffic Analysis Zone (TAZ) data published by the study corridor Metropolitan Planning Organizations (MPO) for the years 2000 (base year) and 2030 (projected year) was analyzed. These data were used to compile a series of maps using GIS that demonstrate household and employment densities within and around the study area corridor. The data were also used to divide the study corridor municipalities by size and density characteristics for the four characteristics described above. This is a useful exercise to help focus real estate market research because it provides a tool to better understand land value differentials across similar marketplaces in the three study corridor counties.
- The analysis is based on a relative comparison of the 28 municipalities to the entire study corridor. In other words, if a place is characterized as high density, it is considered high density relative to the other

places in the corridor. The analysis only considers the portion of each municipality that is located within the boundaries of the study corridor, and therefore the data do not necessarily reflect market conditions for the entire municipality.

2.4.1. Key Findings

The following section discusses key findings from the mapping exercise and analysis described above in regard to household and sector-specific employment trends.

- **Household Density Patterns**

  - Base Year (2000): Base year data indicates that the study corridor becomes less dense north from Downtown Miami, to Indiantown Road in Jupiter. In Miami-Dade County most of the highest density household concentrations are located in or near the downtown area. Moving northward through the county, pockets of higher-density household concentrations alternate between locations to the east and west of US-1 / Dixie Highway. Also of note is the area surrounding the Aventura Mall in the northernmost portion of the county, where there are small concentrations of households that rival Downtown Miami in terms of density. Most of the higher-density household concentrations in Broward County are located in Hollywood, immediately to the west of US-1. The areas of Wilton Manors and the north part of Fort Lauderdale within the study corridor also represent dense clusters of households, followed by sporadically dense areas northward through Pompano Beach and Deerfield Beach. While it is physically the largest of the three counties comprising the study corridor, Palm Beach County is also the least dense in terms of households per square mile. As of 2000, Boca Raton was the densest municipality in Palm Beach County. However, relative to Miami-Dade County, and even some places in Broward County, Boca Raton can only be characterized as moderately dense. The southern part of Delray Beach can also be considered relatively dense by Palm Beach County standards, as can the area immediately north of Downtown West Palm Beach. Low levels of household density define the remainder of the study corridor, as the SFECC passes through communities such as Palm Beach Gardens and Jupiter.

  - Projected Year (2030): Projected year data more accurately reflect the housing boom of the early 20th century that has changed the landscape of coastal Southeast Florida. Most of Downtown Miami is projected to experience a substantial increase in household density. Areas in North Miami are also expected to add significant increases in household density. When compared with base information, it is apparent that most communities within the study corridor are expected to add household density through 2030. Significant increases are projected in Delray Beach and Fort Lauderdale, particularly downtown Fort Lauderdale. Most of Oakland Park, Pompano Beach, and Deerfield Beach are also expected to add household density through 2030. Moderate increases in household density are expected to occur between 2000 and 2030 at various points in Palm Beach County, particularly in

the area from Boca Raton to West Palm Beach. Moderate changes are predicted for both the southern and northern edges of Boca Raton, as well as the central sections of Delray Beach, Boynton Beach, and Lantana. West Palm Beach is expected to experience the most significant increase in household density, particularly in the downtown area. Meanwhile, Riviera Beach, Palm Beach Gardens, and Jupiter are projected to experience moderate density increases in select locations, most of which are located in the western half of the study corridor.

➢ Implications

- **Table 2.18** divides the 28 study corridor municipalities into groups of household clusters that share relatively similar market sizes and density characteristics. The matrix reads from bottom to top, and left to right, with the lower left-hand corner representing the smallest markets with the lowest levels of density, and the largest markets with the highest densities located in the upper right-hand corner. Large, high-density market areas that are projected to experience a rapid rate of new household formation represent significant opportunity for near term value capture from development of housing and ancillary retail, particularly in downtown locations in cities such as Miami and Fort Lauderdale. However, all of the municipalities have the potential to capture a share of incremental value through local policy decisions and economic development initiatives that focus local growth on higher-density residential developments.

Table 2.18: Household Concentration of Study Corridor Municipalities

SIZE OF HOUSEHOLD CONCENTRATION	HOUSEHOLD DENSITY: *Low*	*Low-to-Mod*	*Mod-to-High*	*High*
Large		Pompano Beach Boca Raton West Palm Beach	**Miami** Hollywood **Fort Lauderdale**	
Mid-to-Large		Delray Beach **Boynton Beach**	Deerfield Beach Lake Worth	**North Miami** Aventura Oakland Park
Small-to-Mid	Riviera Beach **Palm Beach Gardens** **Jupiter**	**Dania Beach**	Miami Shores	North Miami Beach Hallandale Beach Wilton Manors
Small	Lantana **Mangonia Park** Lake Park	El Portal North Palm Beach	Biscayne Park	Lighthouse Point

Note: Municipalities in bold & underlined projected to experience a rate of annual growth in the upper quartile relative to the study corridor.

Source: Economics Research Associates, June 2006

➢ Employment Density Patterns

- Base Year (2000): Downtown Miami, south of I-395, is the county's primary employment center. The City of Miami is also home to secondary employment clusters that are concentrated along I-395 just west of I-95, and near US-1 just north of I-195. Other areas with significant employment activity in

the Miami-Dade portion of the study corridor include the area along US-1 in North Miami, as well as the area near the Aventura Mall in the northernmost part of the county. Broward County employment is more dispersed than it is in Miami-Dade, with the only exception being Downtown Fort Lauderdale, the county's main employment center. Pompano Beach contains the second densest concentration of employment in the county after Fort Lauderdale. Notable ancillary employment clusters are also found in Hallandale Beach, Delray Beach, and Boynton Beach, respectively. The two main employment centers in Palm Beach County are located in Boca Raton and Downtown West Palm Beach. Other employment clusters of significance include Delray Beach, Mangonia Park, the area of West Palm Beach surrounding Mangonia Park, and Palm Beach Gardens.

- Projected Year (2030): Projections for period between 2000 and 2030 indicate that Miami-Dade County employment growth will be concentrated in existing employment centers, such as Downtown Miami and the area surrounding the Aventura Mall. Employment projections for Broward County suggest similar growth patterns to those forecasted for Miami-Dade, with the most significant employment increases expected to occur in existing employment centers, such as Fort Lauderdale (especially downtown) and Pompano Beach. Moderate employment growth is also projected for Deerfield Beach and the section of the corridor that passes through Hollywood, especially to the west of US-1. In the southern part of Palm Beach County, it is anticipated that employment growth will be mostly confined to existing employment clusters, with moderate employment increases projected for the northern and southern edges of Boca Raton. Meanwhile, in the central part of the county, significant employment growth is expected in West Palm Beach, particularly in the core downtown area. In addition to the expansion of existing employment centers, secondary employment clusters are expected to emerge in Boynton Beach, as well as in the northern part of the county in Lake Park and Jupiter.

- **Implications:** The matrices presented in **Tables 2.19 – Table 2.21** provide a better understanding of the types of employment concentrations found in the study corridor's 28 municipalities. The matrix reads from bottom to top, and left to right, with the lower left-hand corner representing the smallest markets with the lowest levels of density, and the largest markets with the highest densities located in the upper right-hand corner.

Table 2.19: Corridor Municipalities – Industrial Employment

SIZE OF INDUSTRIAL EMPLOYMENT CONCENTRATION	INDUSTRIAL EMPLOYMENT DENSITY			
	Low	*Low-to-Mod*	*Mod-to-High*	*High*
Large			Miami **Hollywood** Boca Raton West Palm Beach	Fort Lauderdale Oakland Park **Pompano Beach**
Mid-to-Large		Delray Beach **Boynton Beach** Lake Worth		**Deerfield Beach** Mangonia Park **Riviera Beach** Lake Park
Small-to-Mid		North Miami Aventura **Dania Beach** Jupiter	Hallandale Beach Lantana	
Small	El Portal Miami Shores Biscayne Park North Miami Lighthouse Point North Palm Beach	**Palm Beach Gardens**	Wilton Manors	

Note: Municipalities in bold are projected to experience a rate of annual growth in the upper quartile relative to the study corridor.

Source: Economics Research Associates, June 2006

Table 2.20: Corridor Municipalities – Commercial Employment

SIZE OF COMMERCIAL EMPLOYMENT CONCENTRATION	COMMERCIAL EMPLOYMENT DENSITY			
	Low	*Low-to-Mod*	*Mod-to-High*	*High*
Large		West Palm Beach	Pompano Beach Boca Raton Delray Beach	Miami Aventura Fort Lauderdale
Mid-to-Large		Deerfield Beach **Palm Beach Gardens**	Hollywood Oakland Park	North Miami North Miami Beach
Small-to-Mid	**Boynton Beach** Lake Worth Jupiter	**Lantana** **Riviera Beach** **Lake Park**	Hallandale Beach **Dania Beach**	
Small	El Portal Miami Shores Biscayne Park North Palm Beach	Wilton Manors	**Mangonia Park**	Lighthouse Point

Note: Municipalities in bold are projected to experience a rate of annual growth in the upper quartile relative to the study corridor.

Source: Economics Research Associates, June 2006

Table 2.21: Corridor Municipalities – Service Employment

SIZE OF SERVICE EMPLOYMENT CONCENTRATION	SERVICE EMPLOYMENT DENSITY			
	Low	***Low-to-Mod***	***Mod-to-High***	***High***
Large		Pompano Beach	Delray Beach	Miami Aventura Fort Lauderdale Boca Raton West Palm Beach
Mid-to-Large	**Palm Beach Gardens**		North Miami Beach Hollywood Oakland Park Deerfield Beach	North Miami
Small-to-Mid	**Lantana** Lake Worth **Lake Park**	**Dania Beach** **Boynton Beach** **Riviera Beach** **Jupiter**	Hallandale Beach	
Small	El Portal Biscayne Park North Palm Beach	Miami Shores Lighthouse Point	**Mangonia Park**	Wilton Manors

Note: Municipalities in bold are projected to experience a rate of annual growth in the upper quartile relative to the study corridor.

Source: Economics Research Associates, June 2006

The land use suitability analysis, economic market analysis and outputs of the patronage forecasting model will be used to guide the design of appropriately-scaled station facilities that provide a "good fit" between station purpose and the surrounding community in Tier 2. There is anticipated to be a hierarchy of station types reflecting the functions and context of the station environment, which include:

- **Town Center Stations**, which are simple station facilities with minimal transit-dedicated parking. These stations are designed predominately around pedestrian and "kiss-ride" auto forms of access and complement a mixed-use commercial district that adds life and vitality to the station environment.
- **Community Center Station**, which are simple station facilities with minimal transit-dedicated parking. These stations are designed predominantly around pedestrian and "kiss-ride" forms of access and complement a residential neighborhood. **Table 2.17** column “total” provides information on which stations have more of a propensity for a town center and community center station.
- **Regional Park-Ride Stations**, which involve more extensive station facilities with significant parking capacity. "Park-ride" is the predominant form of access.
- **Transfer Stations**, which are facilities designed around the needs of passengers transferring to or from other transit services, Amtrak, and Greyhound, or at airports and seaports.

Finally, as a result of the public involvement process, additional station areas were identified that will be further studied in Tier 2. The potential sites identified were at Cypress Creek, 10th Street, 56th Street, Copans Road, Oakland Park and 4th Court, McNab Road in Broward County and Jupiter Lakes Blvd (adjacent to Jupiter Medical Center) and NW 20 Street (adjacent to the FAU campus) in Palm Beach County.

2.4.2. Operations & Maintenance Facilities

The requirements for operations & maintenance (O&M) facilities are heavily dependent upon the choices eventually made concerning alignment and modal technology to address a specific service need. At the Tier 1 stage of project definition, there are only general elements regarding O&M facilities that can be considered independent and in advance of making specific modal decisions.

O&M facilities are best sited at the ends of service alignments in order to minimize unproductive non-revenue ("deadhead") movements of equipment and operating personnel. In general, the primary factors influencing the specific siting of O&M facilities include:

- Proximity to the end of service alignments
- Availability and cost of real estate
- Adjacent land uses
- Ideally Vacant/Idle Industrial Property
- Compatible with Adjoining Land Uses and Community

There are two general types of O&M facilities:

- **Central Facilities.** A central facility is a large industrial complex that serves a number of operations and maintenance activities, including vehicle washing and cleaning, inspections, repairs and overhauls. Overnight storage yards are often part of central facilities along with associated operational and administration support activities. A central facility consumes a minimum of 20 acres, but property requirements can vary drastically depending on the size and orientation of the property.
- **Satellite Facilities.** Satellite Facilities are simple outlying facilities that are used for overnight vehicle storage, routine vehicle servicing and crew reporting activities. These purposes are typically accommodated with a set of side tracks and a minor structure to house personnel functions and material storage.

Given the extent of the SFECCTA study area, there will likely be at least one central facility required for each modal technology ultimately selected, varying in scale and scope with the complexity of the choice. Given the current design of SFECCTA service segments and dependent upon ultimate decisions regarding the extent of service segments, satellite facilities will likely be needed in vicinity of:

- Tequesta/Jupiter
- West Palm Beach
- Pompano Beach
- Hollywood/Hallandale
- Downtown Miami

2.5. Cost Estimates

2.5.1. Capital Costs

The capital and operating expenses associated with each transit technology can vary drastically by application. Capital costs are combination of infrastructural, property (right-of-way) and rolling stock expenses specific to each alternative.

Planning-level, order-of-magnitude estimates of capital costs were prepared for each alternative. Capital cost estimates are expressed at this level of design as a range of costs based upon unit costs drawn from the recent construction experiences of similar bus and rail transit projects.

The cost of infrastructure is dependent upon a number of factors, including topography, the choice of mode and submodes, locally-driven preferences on such matters as grade-separation and design, and institution decisions concerns the sharing of rights-of-way and facilities (especially track). At this level of project development, infrastructure requirements were estimated in a cursory fashion—e.g.: estimates for rail rapid transit (RRT) alternatives were developed assuming 100 percent elevated, when in fact an RRT alternative in the FEC alignment could possibly run at grade for a significant proportion of its length, especially if dual power-collection systems were employed.

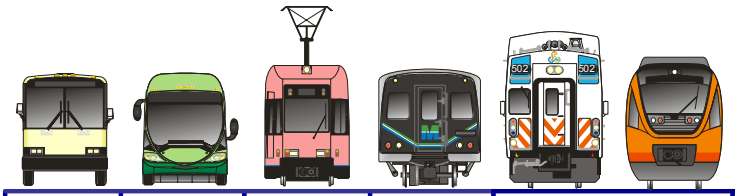
Rolling stock expenses are dependent upon the requirements of the operating plan, which in turn is dependent upon the results of travel demand forecasting. A general estimate of rolling stock requirements was developed based on the length and commercial speeds of each alternative, but this value should be considered a placeholder until a more realistic assessment of fleet size can be developed based on forecasted passenger demand.

The total of all capital costs excluding right-of-way for each alternative are presented in **Table 2.22** and normalized on a per mile basis in **Table 2.23**. This information is useful for a scenario in which the FEC retains ownership of the corridor regardless of passenger service operations by a government entity.

The expense of right-of-way is directly dependent upon the availability and orientation of property in the corridor and subject to negotiations. For the purposes of this cursory analysis, generalized right-of-way costs for a 36-foot wide corridor in each alignment (20-foot wide in the case of an elevated RRT alternative) drawn from recent FDOT acquisitions were applied to the physical extent of each alternative. These costs provide allowances to account for the anticipated cost of commercial and residential relocations, severance damages, cost-to-cures and business damages likely to be incurred for alignments along US-1.

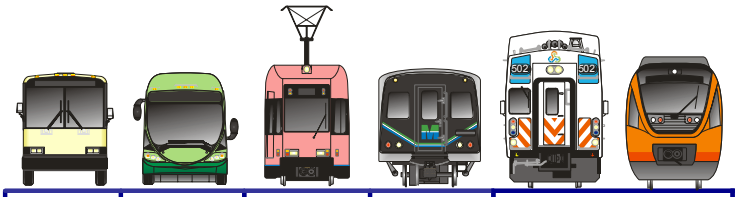
The total of all capital costs including right-of-way for each alternative are presented in **Table 2.24** and normalized on a per mile basis in **Table 2.25**. **Figure 2.16** and **Figure 2.17** illustrate total and per mile capital costs for each alternative, respectively.

Table 2.22: SFECCTA Alternatives Capital Costs (not including Right-of-Way)



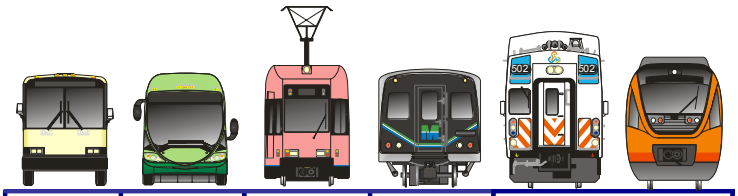
Service Segment	Alignment	Regional Bus	Bus Rapid Transit	Light Rail Transit	Rail Rapid Transit	Regional Rail	
						Tri-Rail	Other RGR
1 West Palm Beach North	FEC		$422 - 671 M	$672 -961 M		$649 - 906 M	
	US1	$12 M	$1.3 - 2.2 B	$1.6 - 2.5 B			
	I-95	$14 M				$2.4 - 3.3 B	
2 North Palm Beach County	FEC		$0.7 - 1.2 B	$1.2 - 1.7 B			$1.1 - 1.6 B
	US1		$2.2 - 3.9 B	$2.8 - 4.6 B			
3 West Palm Beach South	FEC		$0.6 - 1.1 B	$1.1 - 1.6 B			$1.0 - 1.5 B
	US1		$2.2 - 3.9 B	$2.8 - 4.6 B			
4 East Broward County	FEC		$521 - 796 M	$0.8 - 1.1 B			$0.8 - 1.1 B
	US1		$1.5 - 2.5 B	$1.8 - 2.9 B			
5 Ft Lauderdale – Miami	FEC		$0.9 - 1.4 B	$1.4 – 2.0 B	$6.03 - 7.19 B		$1.3 - 1.9 B
	US1		$2.5 - 4.5 B	$3.2 - 5.2 B			
6 Miami Northeast	FEC		$347 - 563 M	$535 - 770 M	$2.62 - 3.13 B		$487 - 708 M
	US1		$1.0 - 1.8 B	$1.2 - 2.1 B			
	Technology:	RGB	BRT	LRT	RRT	RGR	

Table 2.23: SFECCTA Alternatives Capital Costs per Mile (not including Right-of-Way)



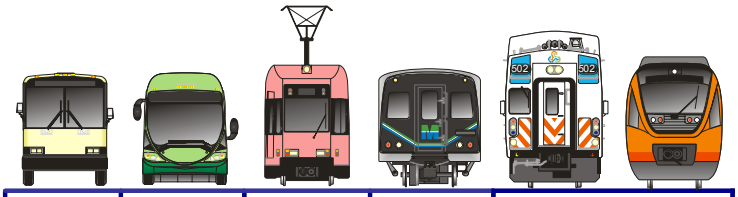
Service Segment	Alignment	Regional Bus	Bus Rapid Transit	Light Rail Transit	Rail Rapid Transit	Regional Rail	
						Tri-Rail	Other RGR
1 West Palm Beach North	FEC		$23 - 37 M	$37 - 53 M		$43 - 60 M	
	US1	$0.7 M	$76 - 129 M	$92 - 146 M			
	I-95	$0.7 M				$171 - 239 M	
2 North Palm Beach County	FEC		$21 - 34 M	$34 - 50 M			$36 - 51 M
	US1		$65 - 115 M	$84 - 134 M			
3 West Palm Beach South	FEC		$19 - 33 M	$33 - 48 M			$28 - 43 M
	US1		$65 - 115 M	$81 - 134 M			
4 East Broward County	FEC		$27 - 42 M	$41 - 58 M			$49 - 67 M
	US1		$69 - 120 M	$86 - 140 M			
5 Ft Lauderdale – Miami	FEC		$23 - 37 M	$37 - 53 M	$172 -206 M		$38 - 55 M
	US1		$64 - 115 M	$81 -134 M			
6 Miami Northeast	FEC		$23 - 38 M	$36 -51 M	$175 -209 M		$33 - 47 M
	US1		$62 - 111 M	$78 - 130 M			
	Technology:	RGB	BRT	LRT	RRT	RGR	

Table 2.24: SFECCTA Alternatives Capital Costs (including Right-of-Way)



Service Segment	Alignment	Regional Bus	Bus Rapid Transit	Light Rail Transit	Rail Rapid Transit	Regional Rail	
						Tri-Rail	Other RGR
1 West Palm Beach North	FEC		$1.2 - 1.5 B	$1.5 - 1.8 B		$1.4 - 1.6 B	
	US1	$14 M	$4.5 - 5.4 B	$4.8 - 5.7 B			
	I - 95	$14 M				$5.1 - 6.0 B	
2 North Palm Beach County	FEC		$2.3 - 2.8 B	$2.8 - 3.3 B			$2.7 - 3.2 B
	US1		$8.7 - 10.4 B	$9.2 - 11.0 B			
3 West Palm Beach South	FEC		$2.2 - 2.6 B	$2.7 - 3.2 B			$2.7 - 3.2 B
	US1		$8.7 - 10.4 B	$9.2 - 11.0 B			
4 East Broward County	FEC		$1.4 - 1.7 B	$1.7 - 2.0 B			$1.6 - 1.9 B
	US1		$5.4 - 6.5 B	$5.8 - 6.9 B			
5 Ft Lauderdale – Miami	FEC		$2.6 - 3.1 B	$3.1 - 3.7 B	$6.9 - 8.1 B		$3.0 - 3.6 B
	US1		$9.9 - 11.9 B	$10.5 - 12.6 B			
6 Miami Northeast	FEC		$1.1 - 1.3 B	$1.3 - 1.5 B	$3.0 - 3.5 B		$1.2 - 1.4 B
	US1		$4.0 - 4.8 B	$4.3 - 5.1 B			
	Technology:	RGB	BRT	LRT	RRT	RGR	

Table 2.25: SFECCTA Alternatives Capital Costs per Mile (including Right-of-Way)



Service Segment	Alignment	Regional Bus	Bus Rapid Transit	Light Rail Transit	Rail Rapid Transit	Regional Rail	
						Tri-Rail	Other RGR
1 West Palm Beach North	FEC		$71 - 85 M	$85 - 101 M		$91 - 108 M	
	US1	$0.7 M	$267 - 319 M	$282 - 337 M			
	I - 95	$0.7 M				$361 - 429 M	
2 North Palm Beach County	FEC		$69 - 82 M	$82 - 98 M			$83 - 99 M
	US1		$254 - 305 M	$271 - 324 M			
3 West Palm Beach South	FEC		$67 - 80 M	$80 - 96 M			$76 - 90 M
	US1		$255 - 305 M	$271 - 324 M			
4 East Broward County	FEC		$75 - 89 M	$89 - 96 M			$97 - 115 M
	US1		$258 - 310 M	$276 - 330 M			
5 Ft Lauderdale – Miami	FEC		$71 - 85 M	$84 - 100 M	$199 - 232 M		$86 - 102 M
	US1		$254 - 305 M	$271 - 324 M			
6 Miami Northeast	FEC		$74 - 88 M	$83 - 99 M	$201 - 235 M		$80 - 95 M
	US1		$252 - 301 M	$268 - 320 M			
	Technology:	RGB	BRT	LRT	RRT	RGR	

Figure 2.16: SFECCTA Alternatives Total Capital Cost (including Right-of-Way)

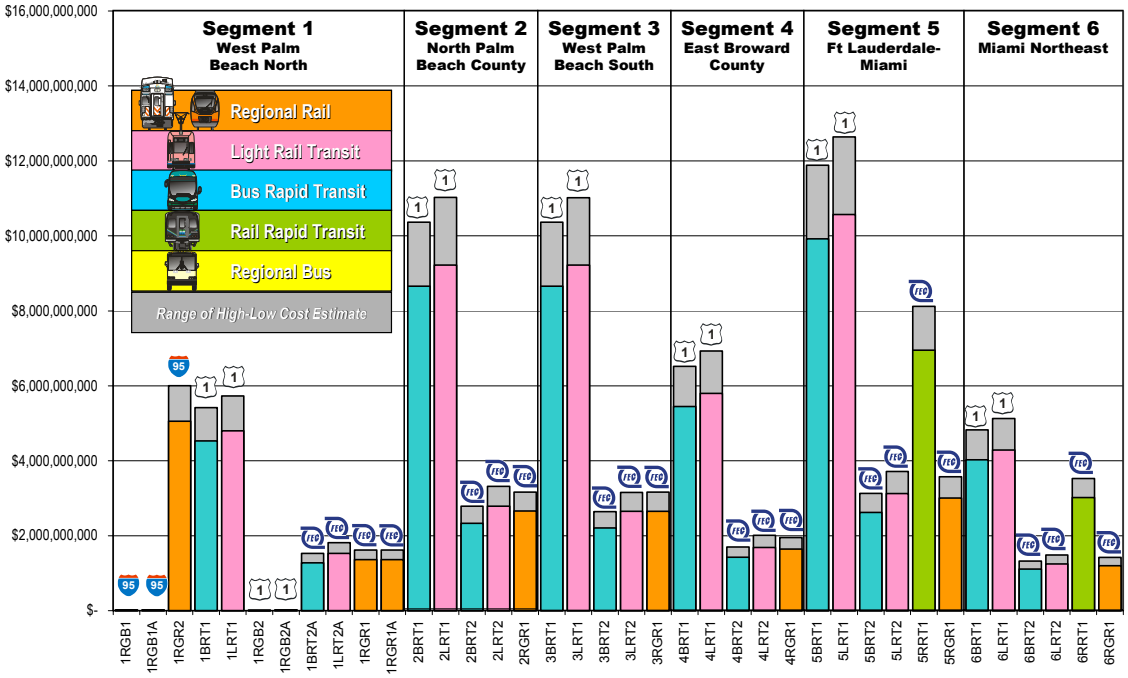
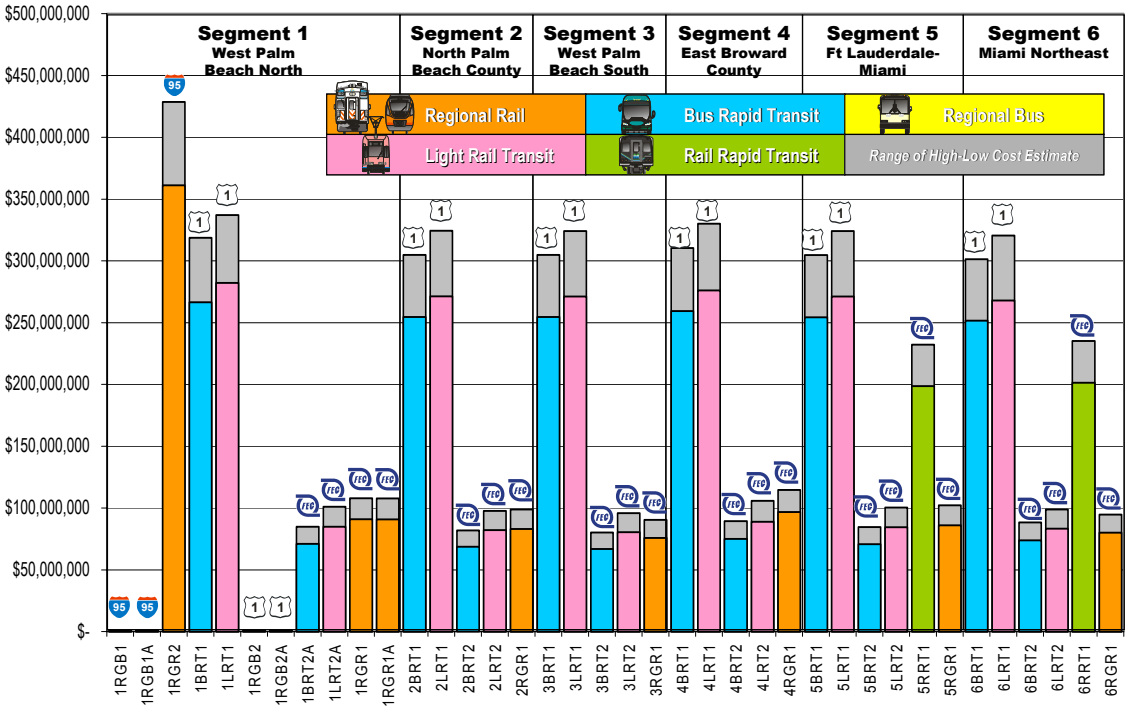


Figure 2.17: SFECCTA Alternatives Capital Costs per Mile (including Right-of-Way)



A review of these capital cost estimates yields the following observations:

- Regional bus (RGB) alternatives for Service Segment 1 have the lowest capital infrastructure costs, mostly the cost of park-ride lots and bus stop shelters.

- Collectively, the relatively short Service Segment 1 alternatives have the lowest overall capital costs. The notable exception is the alternative extending RGR service along I-95 (1RGR2), which is disproportionately expensive compared to every other Service Segment 1 alternative due to extensive grade separation requirements and residential property displacement along the Interstate.
- The cost estimates for rail rapid transit (RRT) alternatives assumed elevated construction and yielded the highest infrastructure costs per mile of any alternatives (although its total cost is less than US-1 options, as discussed below).
- Bus rapid transit (BRT) alternatives are consistently less costly than comparable light rail transit (LRT) and regional rail (RGR) alternatives.
- BRT and LRT alternatives on the US-1 alignment are prohibitively more expensive than their counterparts on the FEC alignment due to the cost of assembling right-of-way and the infrastructure expense of imbedded rail compared to conventional rail construction.

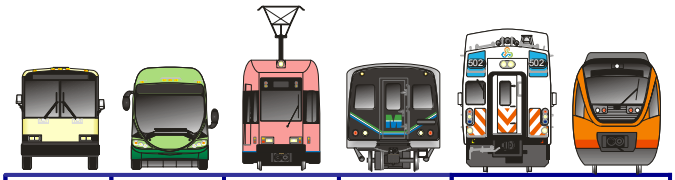
2.5.2. Operating & Maintenance Costs

Meaningful O&M costs are difficult to generate at this level of alternative development. They are more appropriately derived through development of a detailed operating plan that can predict levels of revenue service hours and miles provided in response to the travel demand forecast for a specific alternative. They are significantly influenced by local wage rates, labor practices and service delivery strategies (e.g., decisions concerning direct vs. contracted operations and maintenance).

For this reason, it is difficult to draw valid cost comparisons between similar alignments using different modal technologies without developing detailed alternative descriptions and more than a minimal amount of design. Nevertheless, some generalities can be developed regarding the relative cost of each transit technology applied to the differential length of alternative that can provide a meaningful comparison between initial alternatives.

Generalized operating costs for specific transit technologies were drawn from the modal comparisons contained in the FTA's National Transit Summaries and Trends for the National Transit Database. Given the cursory nature of this exercise and the limited level of information available concerning the individual alternatives at this stage of development, a national average of O&M costs by modal technology per passenger trip was selected as a basis of estimate. The estimated annual O&M costs are presented for each alternative in **Table 2.26**.

Table 2.26: SFECCTA Alternatives Annual Operations & Maintenance Costs



Service Segment	Alignment	Regional Bus	Bus Rapid Transit	Light Rail Transit	Rail Rapid Transit	Regional Rail	
						Tri-Rail	Other RGR
1 West Palm Beach North	FEC		$8.0 M	$8.0 M		$19.8 M	
	US1	$3.1 M	$4.5 M	$4.5 M			
	I-95	$3.1 M				$6.5 M	
2 North Palm Beach County	FEC		$33.2 M	$33.2 M			$109.0 M
	US1		$25.4 M	$25.4 M			
3 West Palm Beach South	FEC		$22.5 M	$22.5 M			$71.1 M
	US1		$16.1 M	$16.1 M			
4 East Broward County	FEC		$8.1 M	$8.1 M			$53.8 M
	US1		$3.4 M	$3.4 M			
5 Ft Lauderdale – Miami	FEC		$39.0 M	$39.0 M	$48.0 M		$179.0 M
	US1		$15.4 M	$ 15.4 M			
6 Miami Northeast	FEC		$19.9 M	$19.9 M	$21.4 M		$69.5 M
	US1		$9.4 M	$9.4 M			
	Technology:	RGB	BRT	LRT	RRT	RGR	

2.6. Preliminary Assessment of Potential Funding Sources

Because transit funding is different from traditional funding of highway programs, a detailed assessment of potential funding sources for the implementation of any of the alternatives described above is included in this chapter. In urban areas of the state, the MPO plays a key role in identifying needed transportation improvements and setting priorities for scarce financial resources. While certainly not all inclusive, the following sections begin the financial planning process by identifying and describing some of the more significant funding options that ultimately may be incorporated into detailed project financial plans. The information below describes potential funding sources available through public sector grant and loan programs, areas where local governments already have existing authorities to generate additional revenues for transportation purposes, and opportunities for the private sector to financially participate in the development of new SFECCTA transit improvements.

2.6.1. Public Sector Grants and Loans

Traditional transportation funding sources include grant programs administered by federal and state transportation agencies and, more recently, innovative financing techniques such as loan programs and public/private partnership (P3) arrangements. Funding transportation improvements within the SFECCTA will require the use of a variety of sources, including federal and state participation in some form.

Following are examples of some of the more prominent federal and state funding programs that may have application.

2.6.2. Federal

- **Federal Transit Administration:** Federal funds typically are involved in funding major transportation improvements, including highways and transit. Under the USDOT, the FTA administers funding programs designed to assist state and local agencies fund major new transit projects, such as new passenger rail services ("New Starts"). Competition for these funds is intense nationally as many cities and regions around the country develop New Starts projects, assuming federal participation as the principle funding source. The cost of a New Starts project can be significant, and the process applied by FTA to approve a project for funding can be rigorous and time consuming. Nonetheless, FTA New Starts funding has been used by many agencies throughout Florida to help fund major transit investments, e.g., Miami-Dade County, South Florida Regional Transportation Authority. New federal transportation legislation, SAFETEA-LU, was signed into law on August 10, 2005. One of the initiatives contained in the new law was the creation of a "Small Starts" program. This new program was designed to help fund transit projects that require less than $75 million in federal funds and have a total cost of no more than $250 million. While this program is new and is awaiting the development of program guidance, it ultimately may have application for smaller projects, such as the Jupiter extension or regional bus initiatives, identified as candidate SFECCTA transit improvements.

- **Federal Highway Administration:** The FHWA also administers funding programs designed to assist state and local agencies fund transportation improvements. The FHWA's funding programs are structured around funding improvements to highways. However, local areas, through their MPO, can "flex" highway funding for use on transit improvements. The process involves a transfer of funds from the FHWA to the FTA. Depending on the nature of the proposed transit improvement, the FTA applies its relevant program requirements to the transferred funds.

- **Federal Credit Assistance:** Under the Transportation Infrastructure Finance and Innovation Act (TIFIA), project sponsors can apply for various forms of federal credit assistance, e.g., direct loans, loan guarantees, etc., in lieu of federal grants. This type of assistance can be a key component in structuring financial plans for major transportation investments. TIFIA loans, for example, are being used successfully to help finance key components of the MIC program. The use of two direct federal loans has enabled the FDOT to accelerate the construction of the MIC program by cost effectively leveraging revenues and other funding sources that would otherwise have accrued to the program over a much longer period of time. TIFIA is administered by the FHWA. There also may be similar credit assistance opportunities available through the FRA that will be evaluated for potential SFECCTA application.

2.6.3. State

- **Florida Department of Transportation:** FDOT administers many programs to help fund transportation improvements across all modes of transportation. Recent program initiatives such as the SIS and the Transportation Regional Incentive Program (TRIP) are designed to provide funding for transportation improvements to major statewide and regional transportation corridors. TRIP was established in Florida's Growth Management reform legislation passed by the 2005 Florida Legislature. The FEC Railway has been designated as part of the SIS. The SFECCTA study effort is a regional undertaking and will produce candidate projects of a regional nature. Consequently, both SIS and TRIP funding have already been identified as candidate funding sources for SFECCTA improvements. The 2005 Growth Management reform legislation also provided significant funding for a state "New Starts" transit program. The program is intended to help fund transit capital projects in metropolitan areas. Based on available funding, candidate projects may receive up to 50 percent of the non-federal share of project costs. The State Infrastructure Bank (SIB) provides loans to eligible transportation projects at very competitive interest rates and flexible repayment terms. Since the SIB's inception, approximately $1 billion in loans have been awarded, representing approximately 12 percent of total project costs. Interest rates applied to these loans have generally been in the 0%-2% range, with repayment terms ranging from as little as two years to as much as 30 years. The SIB provides a financing mechanism that may be used to leverage revenues raised through either public or private sources. FDOT solicits SIB loan applications annually for candidate projects. The SIB will be evaluated during the financial planning process for its potential application as a SFECC financing mechanism.

- **Local Governments:** Local governments in Florida have several basic authorities under which revenues can be raised and funding provided for transportation improvements. These include the authorities provided under Florida's Constitution and the authority provided to local governments under state legislation. Examples include ad valorem taxes and related revenue raising mechanisms, impact fees, special assessments, and a variety of local option taxes. Funding transportation improvements within the SFECC will require the use of a broad array of funding mechanisms, including contributions from affected local governments.

2.6.4. Constitutional and Home Rule Authority

- **Tax Increment Financing:** Under Section 163, Florida Statutes, municipalities or counties are authorized to designate CRA's and may receive contributions from affected taxing jurisdictions within the area. Generally, the contribution formula is based on new ad valorem tax revenue generated from within the CRA subsequent to its creation and adoption of a redevelopment plan. Approval is required by the local governing body and affected taxing jurisdictions. With the rapid growth in new development and significant redevelopment within the three-county region, several CRAs already have been created to take advantage of this value capture technique. As an example, the City of Miami CRA generates approximately $7m-$8m per year in new ad valorem tax revenues. This revenue

stream is projected to increase dramatically once all approved new development within the CRA is built and added to the tax rolls.

- **Special Assessment Districts:** Under Sections 170 and 190, Florida Statutes, municipalities or counties may create improvement districts and levy special assessments on the property owners within the district. Among other things, special assessments may be used for transportation purposes. The improvement or service being funded by the assessment must directly benefit the property owner paying the assessment. Approval is required by the local governing body. Depending on the type of district created, a majority of the property owners also must agree to the assessment. This mechanism has been used successfully to create and sustain business improvement districts (BID) and downtown development authorities (DDA). The City of Coral Gables in Miami Dade County created a BID, which generates approximately $450,000 per year from its assessment. The City of Miami DDA generates approximately $3 million per year from its assessed revenue source.

- **Impact Fees:** Under Florida's Constitution, local governments have strong home rule authority, which empower them to impose and utilize a variety of revenue sources for funding the provision of services and improvements to infrastructure. Special assessments (described above), impact fees, franchise fees, and user fees or service charges are examples of home rule authority revenue sources. The courts have upheld the imposition of impact fees by local governments to fund capital improvements, including transportation improvements. Typically, impact fees are imposed on developers to help fund the cost of the new infrastructure and services needed to serve new development. To impose impact fees, approval is required by the local governing body.

2.6.5. Local Option Taxes

- **Fuel Taxes:** Under Sections 206.41, 206.87, 336.021, 336.025, Florida Statutes, local governments are authorized to levy up to 12 cents of local option fuel taxes in the form of three separate levies – a one cent levy (known as the "Ninth-Cent Fuel Tax"), a six cent levy, and a five cent levy. The proceeds may be used for transportation and infrastructure development. Depending on the levy, at least a majority vote of the governing body or a voter referendum is required to impose the tax. In the three-county region, Miami-Dade has levied 10 cents, and Broward and Palm Beach have imposed the full 12 cents

- **Charter County Transit System Surtax:** Under Section 212.055, Florida Statutes, the Charter County Transit System Surtax may be levied at a rate of up to one percent in eligible counties, which include Broward, Duval, Hillsborough, Miami-Dade, Pinellas, Sarasota, and Volusia. The proceeds may be used for development, construction, operation, and maintenance of fixed guideway rapid transit systems, bus systems, and roads and bridges. Voter approval, through a county referendum, is required for the tax to be imposed. In the three-county region, Miami-Dade has levied a one-half cent

sales tax, which yields approximately $180 million per year in gross receipts. Broward County is considering imposing a one percent sales tax, which is estimated to yield in the range of $260 million annually. Palm Beach County is not defined as an eligible county under Section 212.055, Florida Statutes.

- **Local Government Infrastructure Surtax:** Section 212.055, Florida Statutes, also permits the imposition of the Local Government Infrastructure Surtax. This sales tax may be levied at the rate of one-half or one percent. The proceeds may be used for infrastructure development. All counties in the state are eligible to levy the tax. Voter approval is required. The tax has not been imposed by any of the three counties within the SFECC region.

2.6.6. Private Sector Participation

As candidate SFECCTA projects are identified and the financial planning process becomes more focused, there will be opportunities to explore public/private partnership arrangements as an additional means of funding SFECCTA improvements. These opportunities will take on a variety of structures, some of which are summarized below.

2.6.7. Real Estate Related

Ideally, there will be interest in facilitating TOD around passenger stations or terminal locations, creating opportunities for private sector participation. This could involve a variety of forms. For example, privately owned land donations to facilitate placement of stations enable the value of such donations to help leverage other sources of funding, particularly federal and state grants. To the extent land in potential station areas is already in public ownership or control, there will be opportunities to explore long term lease arrangements with the private sector in exchange for some form of development rights. A long term lease revenue stream can be used to back-stop or repay debt incurred on behalf of the project to help fund transportation improvements.

2.6.8. Ancillary Revenues

Ancillary revenues have been used by many local and regional transit agencies around the country to assist with financing new transit services. The private sector has demonstrated an interest in paying for advertising space, naming rights, sponsorships, concessions and other commercial ventures at transit stations or in conjunction with transit vehicles. Having a station in a prominent location carry a name “brand” has value. Likewise, “wrapping” a vehicle with tasteful advertising also has value and has been successfully used by many transit agencies, including those in southeast Florida. Ancillary revenue mechanisms can generate either one-time or recurring financial contributions from the private sector, which can be applied to funding the cost of new transit services.

2.6.9. User Fees

The SFECCTA study may result in a recommendation to preserve the FEC Railway right-of-way for new passenger rail/transit services, either through acquisition or other means of control. The new owner, presumably a public agency, would find itself in a position to collect fees for use of the asset. A private freight rail carrier, whether the FEC or another company, would want access to the tracks so that service could continue to the many captive shippers located on the line. Use of the tracks for that purpose typically necessitates the need for usage fees and other charges to be paid to the owner by the private company. Revenues from these sources could be applied to the maintenance of the right-of-way and infrastructure as well as investment in the corridor to develop new passenger rail/transit services.

2.6.10. Financial Analysis Process

As conceptual alternatives are shared with stakeholders and aired through the SFECCTA public involvement process, candidate transit improvements will be more fully developed and refined. More detailed information about each alternative is anticipated such as scope, cost, and scheduling/phasing. With this information, the financial planning process can begin in earnest. Each alternative will be evaluated against potential funding sources to arrive at the “best fit”, considering the scope and cost of the improvement compared to funding source/program eligibility requirements. Regarding the scheduling and/or phasing of improvements, financing tools such as low interest loans and other forms of debt will be analyzed as a means to match project cash flow requirements with the availability and timing of funding sources. Decisions on “pay-go” versus debt financing will result from this analysis and be incorporated into corridor-wide and project pro formas. Additionally, the plans and programs of the MPOs and transit agencies operating within the SFECCTA area will be reviewed (MDT, BCT, Palm Tran, and SFRTA) to avoid creating unrealistic or multiple claims on the same external funding sources.

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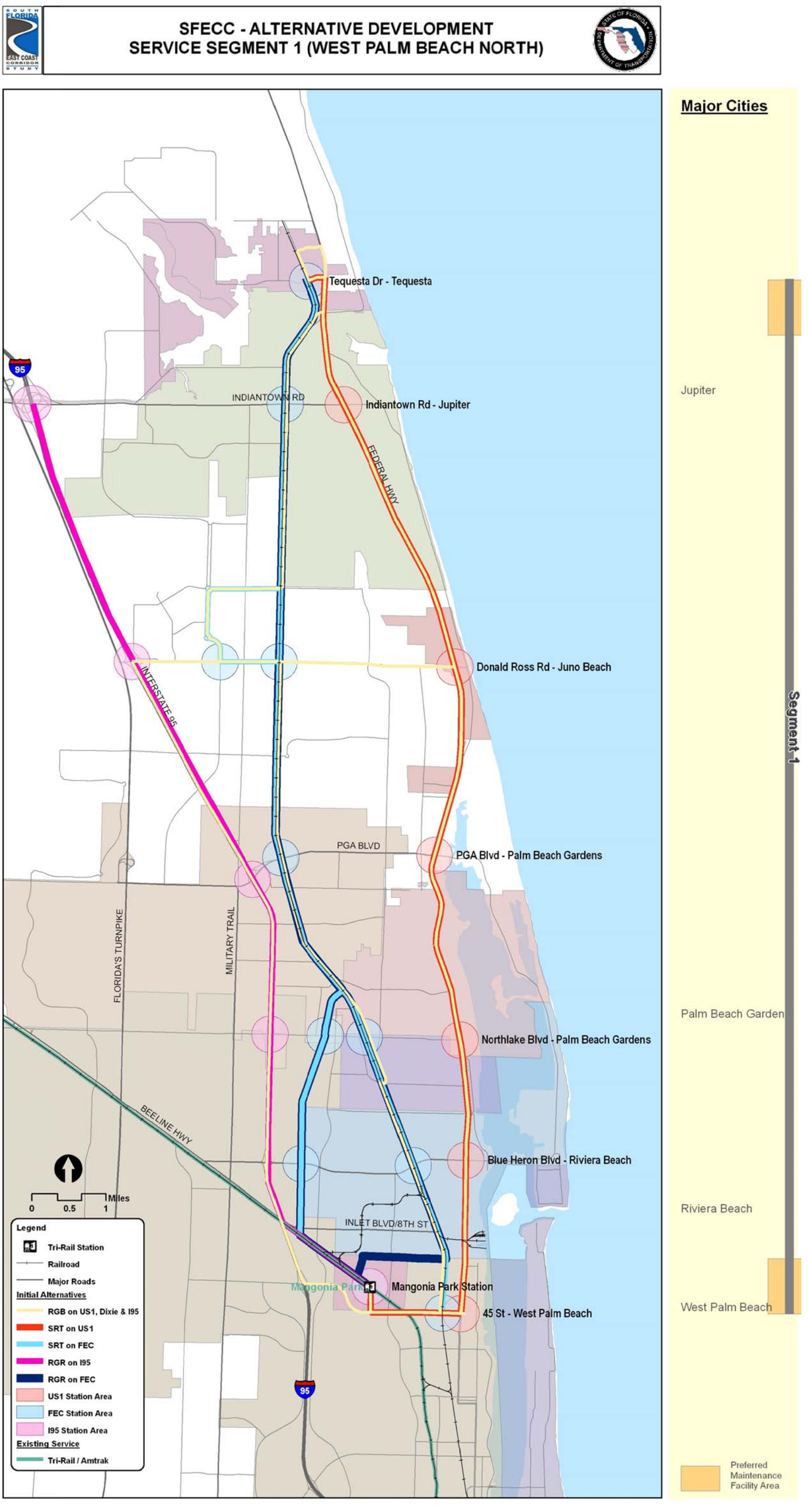

Figure 2.18: Service Segment 1

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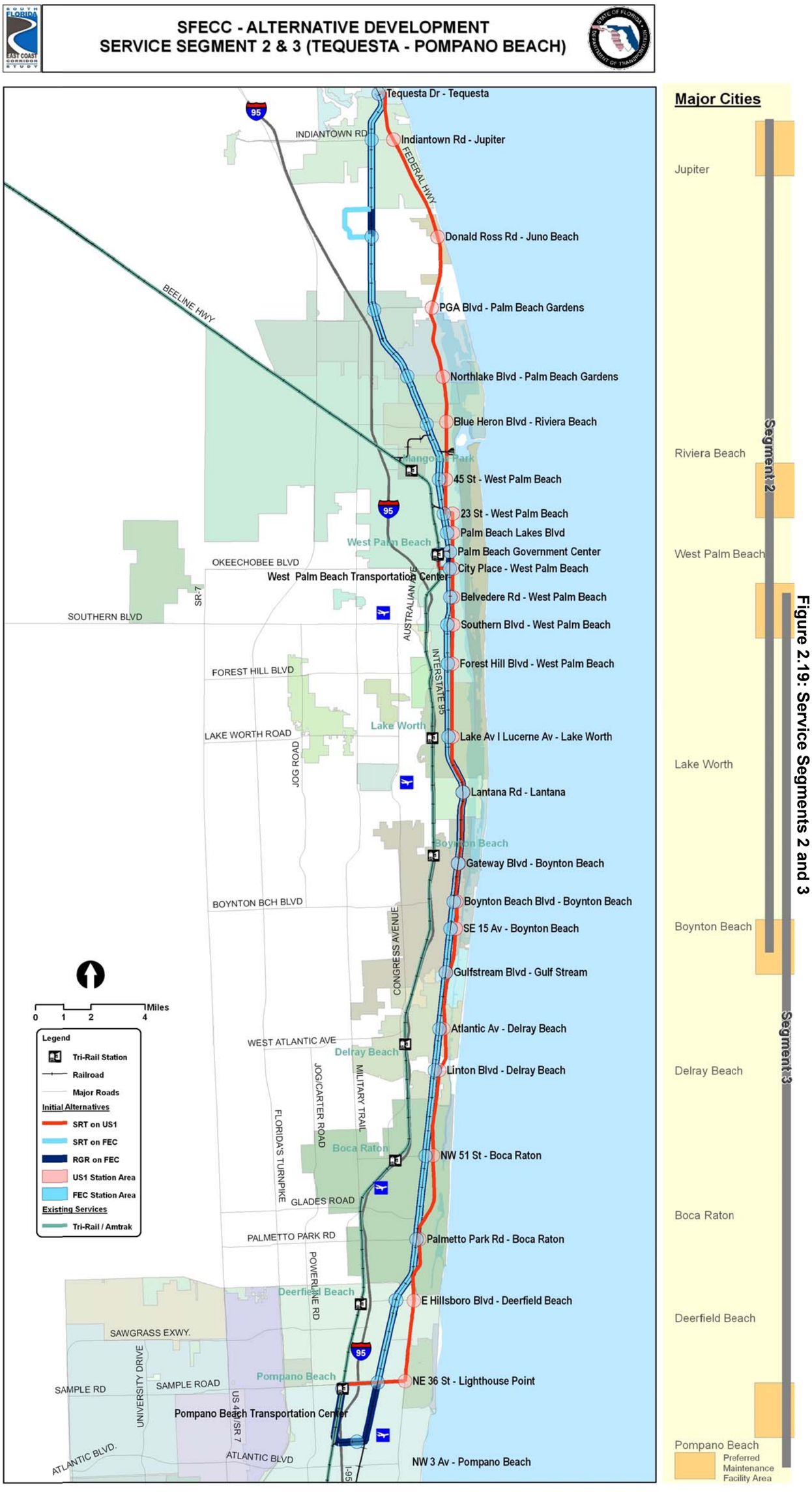

Figure 2.19: Service Segments 2 and 3

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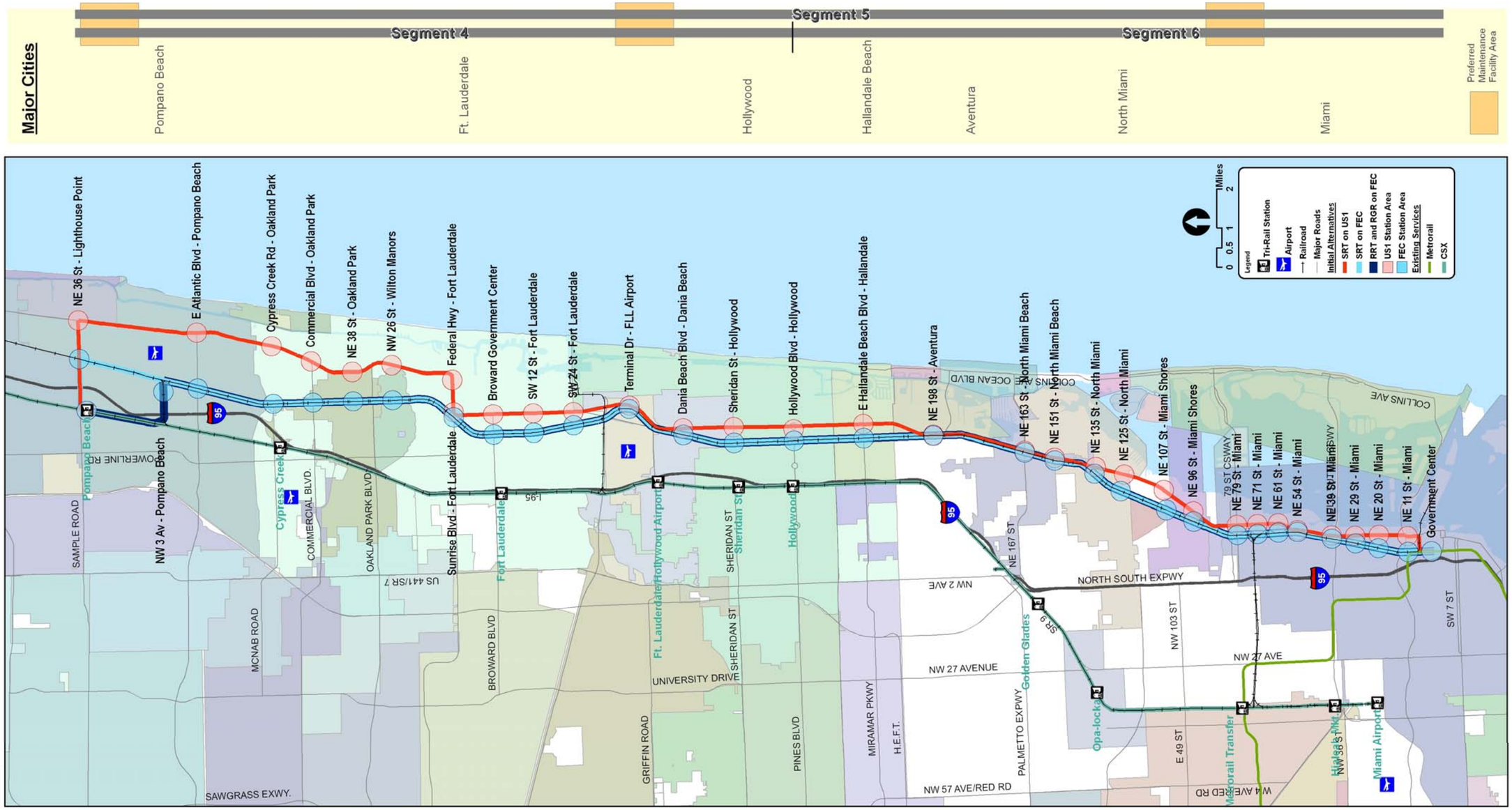
Figure 2.20: Service Segments 4, 5 and 6



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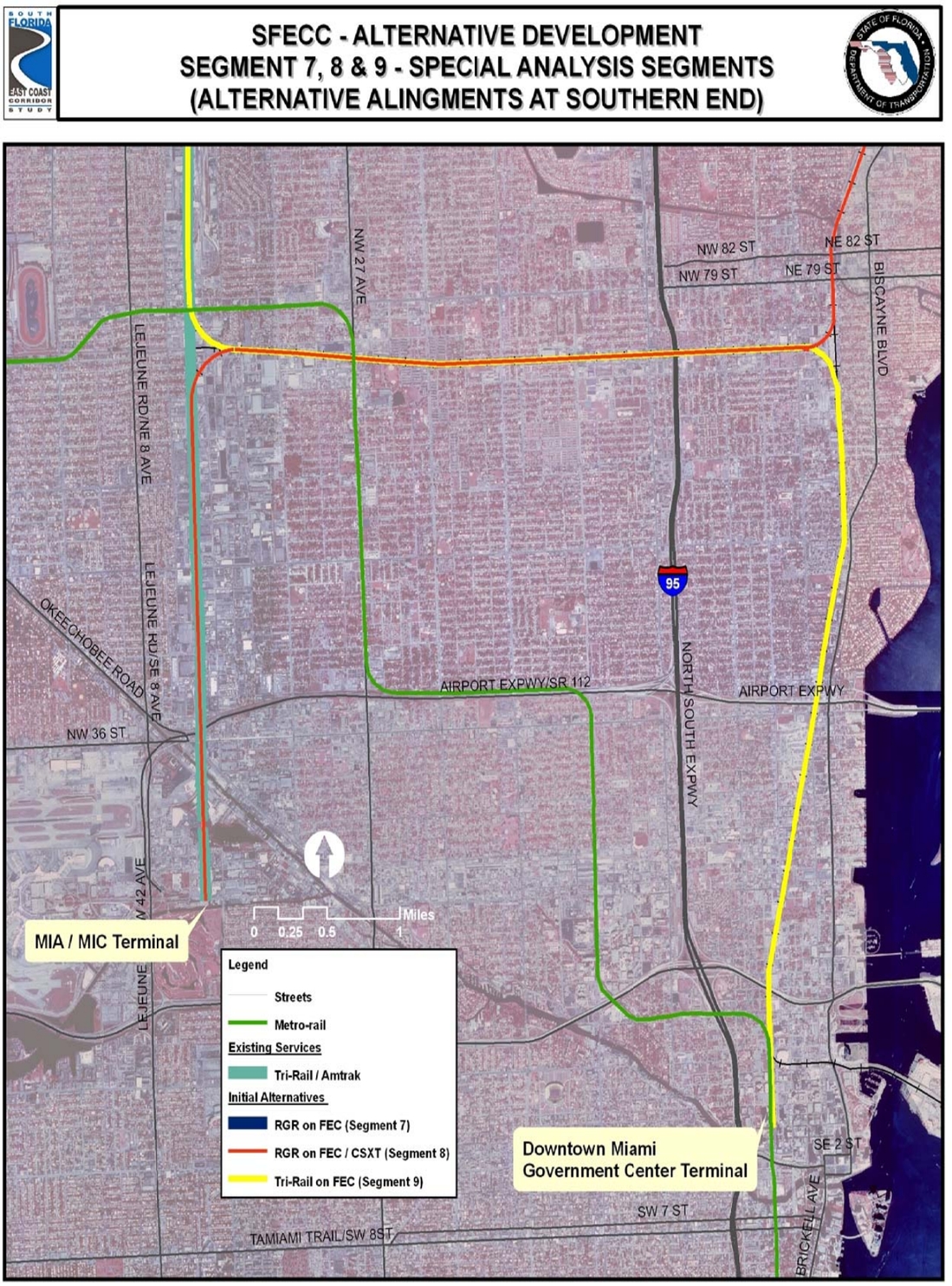

Figure 2.21: Service Segments 7, 8 and 9

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3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The affected environment is described as the existing or baseline social, economic, and environmental conditions of the area affected by the proposed actions associated with the SFECCTA DPEIS. Several representative photographs illustrating aspects of existing conditions along the corridor are included in **Figure 3.1** below and in **Figure 1.4** in Chapter 1.0. This section describes various existing conditions within the SFECCTA study area, including socio-cultural, natural, and physical environments. The entire SFECCTA corridor was divided into four, approximately 20 mile segments (Southern, South Central, North Central, and Northern Study Areas) for environmental analysis purposes. The tables and figures, (the larger of which are located in Appendix A of this report), generally follow the described segmental breakdown of the corridor except where GIS data were obtained in County layers.

The sections addressing environmental consequences directly follow each affected environment section. They discuss the potential direct effects from the proposed project that may have either adverse or beneficial impact on the environment. The evaluations are developed on a programmatic, screening level Tier 1 analysis. In addition, this study identifies environmental consequences that will require further assessment in Tier 2 NEPA analyses. The evaluations of potential impacts in the DPEIS are undertaken according to the NEPA of 1969 (42 U.S.C. 4321 et seq.).

Due to the large size of the study area there are potential impacts to neighborhoods and communities, historic and archeological resources, parkland and recreational areas, biological resources and natural resources. There are no Native American tribal lands in the project vicinity. Moreover, alternative alignments will have different impacts to these resources as well as impacts to air quality, the view shed and noise and vibration. Each of these environmental effects are detailed and analyzed for the purposes of Tier 1 screening of alternatives. A screening approach is appropriate in Tier 1 since a large number of alternatives are still being considered for segments of the corridor as well as the entire 85 mile corridor as a whole. Therefore, the individual and/or cumulative effects of each alternative on environmental resources cannot be precisely detailed at this point. However, summary tables of these impacts for the different alignments have been developed for use in the Tier 1 screening process and as baseline data for more detailed Tier 2 analyses.

The environmental impacts associated with implementation of proposed premium transit services will depend to a large extent upon the nature of the existing human (i.e., built) and natural resources adjacent or in close proximity to the existing urbanized alignments along US-1, I-95, and the FEC Railway corridor. It is anticipated that the degree of impacts will be most directly associated with the technology chosen as the preferred. For example, the regional rail and light rail alternatives will need to be analyzed for specific noise and vibration issues unique to steel wheeled transit systems. All the alternatives are along existing alignments: the FEC Railway, US-1, and (in northern Palm Beach County only) I-95.

Figure 3.1: SFECCTA Project Environmental Features

Photo 1: FEC Railway in North Miami Beach, Miami-Dade County, October 2005

Photo 2: FEC Railway double track section in Broward County, October 2005

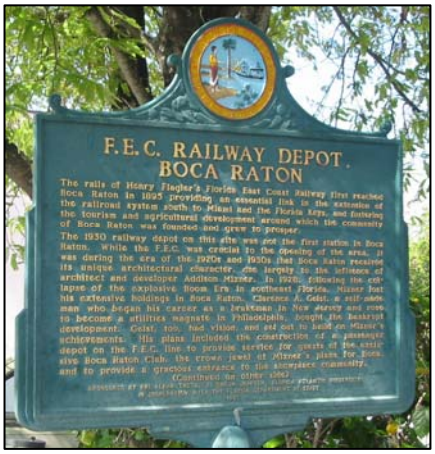


Photo 3: FEC Railway Historic Station Plaque in Boca Raton, Palm Beach County, October 2005

Photo 4: FEC Railway in Ft. Lauderdale, (note hi-rise development in background), Broward County, Oct. 2005

Photo 5: Historic FEC Railway in old Downtown Miami, Miami Dade County, c. 1920s

Assessment of other requirements under NEPA such as secondary (i.e., indirect) and cumulative effects, construction impacts, and mitigation for unavoidable, already minimized impacts are discussed herein to the level possible in Tier 1. However, most evaluation of construction impacts and mitigation will necessarily have to be deferred until Tier 2 since the intended purpose in Tier 1 is an overview of the broad areas and large datasets available for the entire tri-county study area. The evaluation of what specific effects each combination of alignments and technologies (that together comprise the various alternatives) will have on the communities and surrounding natural resources is in most cases most appropriate in the Tier 2 NEPA documents.

3.1. Neighborhoods and Communities

3.1.1. Affected Environment

- **Population and Community Growth Characteristics:** According to U.S. Census information, between 1990 and 2000, the populations of Broward, Miami-Dade, and Palm Beach County rose 29%, 16%, and 31%, respectively, and by 2030, the tri-county's population is expected to increase by almost 3 million people. A preliminary GIS analysis of U.S. Census data and the SERPM model for the years 2000 to 2030 indicates that there is a 49% projected population growth within the SFECCTA study area as compared to 43% for the rest of the tri-county area, (**Table 3.1**). As identified in Table 1.5 and Table 1.6 in Chapter 1.0, demographic (i.e., population characteristics) trends within the SFECCTA study area are projected to exhibit higher overall densities in Population, Households, and Employment than in the tri-county area as a whole. For example, the projected population density in the study area within Miami-Dade, Broward, and Palm Beach Counties is 14, 12, and 8 respectively whereas the tri-county area projected density in 2030 is 6 persons per acre.

Table 3.1: Projected Demographic Trends - SFECCTA and the South Florida Tri-County Area

Area of Consideration		Density (per acre)		Growth (%)	
		2000	**2030**		**Area (acres)**
Within 1 Mile Buffer of FEC Railway	Population	830,300	1,233,900	49%	123,800
	Households	349,200	515,400	48%	
	Employment	648,800	883,000	36%	
Outside 1 Mile Buffer of FEC Railway (Remainder of Miami-Dade, Broward, Palm Beach Counties)	Population	4,051,900	5,802,400	43%	1,017,600
	Households	1,553,400	2,208,600	42%	
	Employment	1,642,900	2,294,000	40%	

Note: The bold values for the year 2030 represent units per acre.

Recent census estimates show that for the 12- month period ending July 2005, 15 of the nation's 100 fastest-growing counties (by percent growth) are in Florida, the most of any state. Florida had 22 of

the nation's 100 counties with the largest county increases. Palm Beach added 24,359 residents (30,835 in 2004 – more than any county in Florida), while Broward added 24,638 and Miami-Dade County added 17,300 residents, respectively. Within the SFECCTA study area (the eastern spine of the tri-county region), these population figures indicate approximately 61 percent growth between 2000 and 2030 but only approximately 37 percent growth in employment in that same time period. Therefore, the corridor will grow more in its residential sectors and be more of a transit "rider supplier" than a trip generator corridor based on employment opportunities. Furthermore, general population growth within the SFECCTA study area will benefit from transit improvements within the corridor. High concentrations of transit-dependent populations currently occupy the SFECCTA corridor area as shown in **Table 1.7** and **Table 1.8** and in **Figure 1.9** and **Figure 1.20** in Chapter 1.0. Transit-dependent populations will also benefit from transit improvements.

The SFECCTA includes the potential for connection to a large number of social and economic travel generators such as 3 of 7 airports in southeastern Florida that are within the SFECCTA area or abut the FEC Railway right-of-way (with the other airports in close proximity). It is also the only rail-service provider to major employment areas at the PPB, PEV, and POM. Improvement in service to these facilities is anticipated to support the continued economic development throughout the area. For example, the POM generates almost 100,000 jobs in the Miami-Dade County area and has an estimated countywide economic impact of $12 billion annually, making it the second largest economic engine in Miami-Dade County.

- **Community Cohesion:** As one of the social impact categories being evaluated in the SFECCTA, community cohesion is being considered in developing a community profile for neighborhoods adjacent to or within the study area and the community as a whole. The community is to be considered both on a local level (neighborhood, city, county) and regionally (the tri-county area), due to the scale of the project study area. Issues such as the potential to bisect or divide neighborhoods and community redevelopment areas, isolating ethnic groups or neighborhoods, facilitation of new development (infill), urban renewal, joint land use/transit-oriented development, and others will be considered. It is anticipated that impacts may be beneficial, adverse, or a mixture of both (considering the local residents in a neighborhood bisected by a proposed alignment and the commuting patterns of employees residing elsewhere but working in the same neighborhood). The existing FEC Railway right-of-way impedes pedestrian access, and restricts all vehicular access, to designated RR crossings.

  The study area is multi-jurisdictional from several perspectives. First, there are three counties and 47 cities (28 directly on FEC Railway), as well as multiple Downtown and Community Redevelopment Agencies, following the Atlantic Coast in the SFECCTA study area that all lack a continuous transit connection service (see **Table 1.1** in Chapter 1.0 or **Table A.1** and **Figures A.2 – A.5**, in Appendix A). Appendix A contains tables and figures too large or numerous to include in the DPEIS text (**Figure A.1**

is a key sheet for the Appendix A figures). Drainage is regulated by the South Florida Water Management District (SFWMD), local County agencies, and in some areas, Special Drainage Districts. Additionally, there are numerous political districts, school districts, and emergency service boundaries, some of which are associated with the county and municipal governments. Moreover, the SFECCTA study area traverses many of the cities downtowns which are currently experiencing growth and redevelopment. Some of the respective cities are already planning transit friendly development in close proximity to the corridor.

Additional preliminary GIS analysis in Tier 1 indicates the magnitude of the community profile that will be generated for the SFECCTA and the need for Social/Community Impacts Assessments in Tier 2 segmental studies. The results of the GIS analysis of community services to be included in the SFECCTA are presented in **Tables A.2 – A.4** and **Figures A.6 – A.9** (see Appendix A), with Community Redevelopment Areas (CRAs), Police and Fire Stations shown in the figures.

3.1.2. Environmental Consequences

- **Population and Community Growth Characteristics:** Due to the high concentration of transit-dependent populations in the study area, specific attention was focused on applying environmental justice guidance. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994) was issued to re-emphasize the intent of the Civil Rights Acts and expanded protection to low-income populations. Federal agencies are now required to provide minority and low-income communities appropriate access to public information and opportunities for community input in the NEPA process. They are also required to identify potential adverse or beneficial environmental effects and mitigation measures in consultation with affected communities and improve the accessibility of meetings, crucial documents, and notices.

  In addition to Executive Order (EO) 12898 above, DOT Order 5610.2: Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (April 1997) establishes procedures for the USDOT to use in complying with EO 12898. These orders include procedures directing that disproportionate adverse human health and/or environmental impacts on low-income and minority populations are to be avoided, if practicable, unless avoiding such disproportionate impacts would result in significant adverse impacts on other important social, economic, or environmental resources.

  In the Tier 1 public involvement and scoping process, the SFECCTA had demonstrated compliance with EO 12898 in reaching out to all communities involved, including minority and low-income communities. Environmental justice considerations of splitting neighborhoods and communities will be very important in the Tier 2 program of socio-cultural effects evaluations (this is anticipated to be an

ongoing series of socio-cultural evaluations as the Tier 2 studies progress along the SFECCTA corridor, including ETDM programming). Secondary (i.e., indirect) and cumulative effects, construction, and mitigation for Neighborhoods and Communities are anticipated to include the following:

- Secondary (indirect) and cumulative economic effects are anticipated to follow the current redevelopment trends along the eastern spine of the Tri-County area and may be positive in the form of job creation and tax base increase or negative in terms of changes in employment needs (e.g. service industry vs. highly technological based). This region is experiencing increasingly intense urban development and redevelopment through infill of primarily CBD areas with expansion of the CBDs by patterns of outward spread of residential, commercial, entertainment and mixed-use developments. Implementation of premium transit service within the SFECCTA corridor is anticipated to capitalize on this eastward urban redevelopment, which should result in better mobility, increased transit use, and minimization of single vehicle usage The potential for cumulative impacts in the form of continued displacements of existing uses as a result of redevelopment may be accelerated with additional transit in the corridor, potentially due to the secondary and cumulative effects of continued densification of development along the corridor. However, opportunities for workforce housing, affordable housing and mixed income communities are increased with the availability of premium transit as compared to present conditions in these communities.

- Construction effects also can be positive or negative. For instance, implementation of premium transit services in the SFECCTA corridor may provide benefit to low income populations by provision of jobs and job training during construction (temporary employment) and operation phases (permanent employment) of proposed transit. Tier 2 studies will evaluate beneficial (positive) and adverse (negative) effects of construction in more detail, including negative impacts such as noise and vibration, dust, visual aesthetics and more. These will include both temporary construction impacts such as dust and construction noise or vibration as well as visual aesthetic, local traffic impacts, etc. (most of which will have corresponding permanent impacts from long-term operation of transit services).

- Mitigation will also need further evaluation in Tier 2 to determine where mitigation measures are reasonable or feasible.

The following guidance[3] will be used to assess environmental justice concerns during the Class of Action Determination for the Tier 2 segmental studies:

[3] This guidance is available at www.fta.dot.gov/transit_data_info/reports_publications/publications/environment/4805_5139_ENG_HTML.htm

- **Environmental Justice Assessment Process:** Under the process outlined in EO 12898 and the USDOT's order, consideration of environmental justice issues must be considered during preparation of an EIS. General principles required as part of the EIS analysis are as follows:

  - **Identification of Minority or Low-Income Populations:** Agencies should consider the composition of the affected area to determine whether minority populations, low-income populations, or Native American tribes are present, and if so whether there may be disproportionately high and adverse human health or environmental effects on these populations. This identification should occur as early as possible during the EIS process.

  - **Public Participation:** Agencies should develop effective public participation strategies that assure meaningful community representation in the EIS process.

  - **Numeric Analysis:** Where a disproportionate and adverse environmental impact is identified, agencies should consider relevant demographic, public health and industry data concerning the potential for exposure to human health or environmental hazards in the affected population, to the extent that such information is reasonably available.

  - **Alternatives and Mitigation:** The relative impact of alternatives should be considered, and measures to avoid, minimize, and mitigate impacts should be evaluated as part of the EIS.

- **Community Cohesion:** There will be numerous and widespread positive effects on community cohesion as a result of improving transit services within the communities served by the SFECCTA. These include, but are certainly not limited to, opening up new inter-community and improving intra-community access with provision of new station locations as well as affordable and reliable premium transit services. In addition, the improvements in access to jobs, social/government services, recreation opportunities, etc., especially to the disproportionate numbers of transit-dependent populations residing in the study area, would be a far reaching enhancement of community cohesion resulting from new transit services in the SFECCTA study corridor. Transit expansion envisioned by any of the alternatives developed in Tier 1 will provide greater connectivity for the community and their potential access to jobs, recreational opportunities, healthcare, educational and tourist destinations. Therefore, it is anticipated that the impacts on the study community will be positive. Many municipal governments are expressing support for this project as a benefit to their constituents, including the mayors of nine (9) municipalities that have expressed support for the project by passing resolutions in favor of passenger service along the FEC Railway (see Chapter 7.0, Section 7.2.5, Local Agency Resolutions).

To illustrate further, the potential for a continuous transit connection between the three counties and connections to 47 cities will enhance the sense of community cohesion within the region. Moreover, the SFECCTA traverses many of the cities downtowns which are experiencing growth and redevelopment.

Some of the respective cities are already planning transit friendly development in close proximity to the corridor. Thus, the study will enhance the opportunities for community cohesion within the region both directly through improved transit service and indirectly through increased resilience of communities. Building a transit corridor within these communities would enhance access to affordable housing, social services, jobs, education, and healthcare within the community, thereby assisting transit-dependent populations to remain in their neighborhoods despite rising land values. This benefit is cumulative with anticipated benefits to Community Cohesion resulting from other existing and planned transit services such as Metrorail/Metromover/Metrobus and the Miami Streetcar in Miami-Dade County, the Central Broward East-West Transit Corridor and DDA Downtown Rail Link in Ft. Lauderdale, as well as the Central Palm Beach County Okeechobee Boulevard BRT (see **Table 1.9** in Chapter 1.0).

There may be adverse effects on street traffic when railway crossings are closed more often to accommodate passing transit service. More frequent train service will mean more gate closings, although passenger trains are shorter and faster than freight trains so their impact on traffic is less severe. The study will analyze the need to raise either the roadway or the tracks, or close crossings altogether wherever practical, in order to minimize delays to auto traffic. FDOT will work closely with each municipality along the FEC alignment and these issues will be studied in greater detail in Tier 2 as part of a program of RR crossings evaluations.

Finally, safety and noise issues along the FEC Railway may result in Tier 2 recommendations for fencing to restrict or prevent pedestrian crossing of the new transit line as well as potential noise walls to mitigate or abate noise impacts. These elements can have both positive and negative effects on a community by enhancing safety and quality of life; on the other hand, these elements can physically and aesthetically divide communities to a greater extent than the existing transportation facilities currently do.

It is anticipated that the Tier 2 segmental studies may each require a Coordination Plan as part of the overall study Public Involvement Plan that complies with the SAFETEA-LU signed into law on August 10, 2005, Section 6002, as a plan for coordination (SAFETEA-LU Section 6002: Section 139(g)(1)). The Coordination Plan is intended to guide the project team through the agency and public coordination activities, unless it is determined that the FDOT Public Involvement Program and ETDM process sufficiently comply with this provision of SAFETEA-LU.

3.2. Land Use, Zoning, and Economic Development

3.2.1. Affected Environment

- **Existing Land Use:** The SFECCTA study corridor passes through a mix of predominantly urban land uses, including CBDs, ports, an international airport, several regional airparks, residential (including low

income housing), institutional, and natural areas/parklands including Biscayne Bay, wetlands, coastal hardwood hammocks, xeric scrub/shrub, and open/vacant land. The study corridor also includes portions of Southeast Florida's two railroads, the FEC Railway and the CSXT, beginning in southern Miami-Dade County and traveling to north central Palm Beach County, which are vital links to the tri-county area major seaports, airports, and downtowns (**Figures A.10 – A.13** in Appendix A illustrate existing land uses within the SFECCTA study area).

As described in the Eastward Ho! Study (available for free download at ftp://www.sfrpc.com/pub/eho/ehobook1.pdf or upon request), current land uses in the study area bear witness to the extensive public investments made in response to the growth experienced by Southeast Florida throughout the twentieth century. Major economic generators such as international and local airports lie almost evenly spaced along the study area. Each county has its own active and expanding seaport as well as performing arts center. Utility plants, primarily wastewater treatment, and potable water treatment plants, are also located throughout the study area. In terms of parks, recreation, and open space, there is a greater concentration of open space in Palm Beach County. Throughout southeast Florida, most open space is generally found in the central and western portions of each county. A GIS analysis of land uses is presented below as percentage of total land area within the SFECCTA study area ("study area lands"), not including open water bodies lying within 1 mile of the FEC Railway. Therefore, only mainland areas were tabulated. Residential is the primary land use within study area lands (shown in bold italics in **Table 3.2**), followed by natural, urban/commercial, transportation, recreation, and agricultural activities.

Table 3.2: SFECCTA Percent Existing Land Use (1.0 mi Buffer)

	Residential	Urban and Commercial	Parks and Recreation	Agricultural Land	Natural Land Cover	Transportation
Study Area Lands	38.73%	16.44%	4.00%	0.19%	26.79%	13.85%

Source: SFWMD, 1999
Residential = low, medium, and high density single family and multiple dwelling units; mobile homes.
Urban/Commercial = commercial services; shopping centers; junk yards; oil and gas storage; cemeteries; industrial; institutional, military, and educational facilities.
Recreation = beaches; golf courses; race tracks; marinas; parks and zoos; stadiums; open land.
Agricultural Land = improved pastures; row and field crops; fruit orchards; tree nurseries; ornamentals.
Natural Land Cover = reservoirs; lakes; natural streams, rivers, and waterways; channelized waterways and canals; habitat types (e.g., Australian pine); disturbed undeveloped land.
Transportation = communication and utility facilities; airports; railroads and rail-yards; roads and highways; ports.

- **Zoning:** The zoning characteristics along the FEC Railway corridor in Miami-Dade County are predominantly in the Industrial and Commercial categories. The industrial uses are concentrated in southern Miami-Dade County in close proximity to the CBD of Miami. Much of this zoning is being revisited by the County and the City of Miami due to intense redevelopment pressures, increased land values, and the minimal use of the corridor for industrial and commercial purposes in this area at the present time.

  There are some isolated areas ("pockets") in northern Miami-Dade within the cities of North Miami and Aventura where the zoning adjacent to the FEC Railway corridor is predominantly residential. In southern Broward County, existing zoning along the FEC Railway is a mix of residential and small scale commercial. In closer proximity to the FLL Airport and north to Sunrise Boulevard the character of the existing zoning changes to much more intense commercial uses. Zoning is then predominantly residential adjacent to the FEC Railway corridor except at major grade crossings with east/west roadways where the zoning converts to commercial again. Along northern Broward County, specifically in the Pompano Beach area, the zoning includes more industrial uses due to the existence of FEC Railway facilities and services to the area.

  In Palm Beach County, the existing zoning along the FEC Railway consists mostly of a mix of residential and commercial uses for a significant length. However, unlike in the other two counties, the commercial zoning in Palm Beach occurs mostly on the east side of the FEC Railway, while the residential zoning is mostly located on the west side of the corridor. North of the split between the SFRC and the FEC in northern Palm Beach County (i.e., north of West Palm Beach), the zoning along the FEC Railway is predominantly residential.

- **Economic Conditions and Development:** Earnings within the SFECCTA study area, as shown in **Table 3.3**, are predominantly in the lower brackets (<$15,000, $15,000 to $25,000, and $25,000 to $30,000 household incomes aggregated together yield 52 percent) with fewer households in the upper

income brackets ($30,000 to $40,000 up through >$60,000) than in the rest of the three counties. In comparison, the population outside the study area throughout Miami-Dade, Broward and Palm Beach Counties only yield 39 percent of the total households in these lower three income brackets. This indicates a prevalently transit-dependent population with more people at lower incomes living in greater density, warranting consideration for transit service improvements. Additional GIS analysis by individual counties showed the same trends for each county with the highest projected 2030 population and household densities of the entire SFECCTA study area in Miami-Dade County (coupled with the highest disparity of households in lower income brackets within the SFECCTA study area as compared to the remainder of that county). There is therefore a demonstrated need for economic development that benefits these communities, and especially the transit-dependent populations that reside and/or work there.

Table 3.3: 2000 Household Income

Area of Consideration	Income Brackets					
	<15K	15 - 25K	25 - 30K	30 - 40K	40 - 60K	>60K
Within 1 Mile Buffer of FEC Railway	30%	15%	7%	11%	19%	18%
Outside 1 Mile Buffer of FEC Railway (Remainder of Miami-Dade, Broward, Palm Beach	23%	13%	6%	11%	23%	23%

Source: U.S. Census 2000

3.2.2. Environmental Consequences

- **Existing Land Use:** The alternatives being considered would positively impact the existing land uses along the corridor. As mentioned previously, many of the communities (some of the oldest in southeast Florida) along the corridor are experiencing redevelopment and the provision of a transit corridor would enhance the redevelopment opportunities. Some of the alternatives along the FEC corridor would have to be developed in a manner sensitive to adjacent residential uses especially considering that discussions regarding noise and noise abatement have consistently occurred during the public involvement process. Alternatives along the US-1 corridor could also potentially impact adjacent businesses, also a concern noted during the public involvement. These effects on land use within the study area may be both beneficial and adverse, which will require evaluation in the Tier 2 segmental studies for each segmental project's influence on land use particularly in relation to station locations, types of stations and parking amenities, traffic patterns, and joint development opportunities, including but not limited to TOD with or without affordable/workforce housing units. The FHWA responded to the purpose and need in the ETDM coordination process. The FHWA reviewer on the ETDM Environmental Technical Advisory Committee (ETAT) inquired if the project is in the LRTPs. As stated

in the purpose and need, under federal, State, and local government authority, this project is consistent with Miami-Dade, Broward and Palm Beach Counties comprehensive plans, LRTPs, and TIPs.

- **Zoning:** Many communities are already changing their zoning designations towards a more transit friendly and accommodating use throughout the study area. Zoning changes are made by local governments and will be continued along the alignments where transit is being considered with or without transit improvements. These changes could positively impact the adjacent corridors and revitalize single use neighborhoods. Again, with respect to adjacent residential uses along any of the alignments, consideration will have to be given in Tier 2 NEPA studies to how TOD associated with proposed station locations can be coordinated with local government planning entities, preserving or enhancing existing residential uses (including affordable and/or work force housing) where possible.

- **Economic Conditions and Development:** A Precedent Report on TOD for SFECCTA has been completed as part of the overall SFECCTA work effort. This precedent study report identified where TOD-spurred positive economic development activity occurred adjacent to transit in other communities (the precedent study is available upon request). Joint use development opportunities will arise as a result of a transit corridor and associated station areas. Moreover, expansion of transit with any of the alternatives developed can provide mobility for greater job access in the region. Therefore, the economic conditions of the study area would benefit overall from the expansion of transit service.

3.3. Land Acquisition, Displacements and Relocation of Existing Land Uses

3.3.1. Affected Environment

- **Land Acquisition:** Many cities in the corridor have also demonstrated interest both in developing transit services along this corridor and in supporting associated redevelopment by implementing redevelopment plans including land acquisitions initiatives. These cities include: Miami, North Miami, Hollywood, Fort Lauderdale, Oakland Park, Delray Beach, Lake Worth, and West Palm Beach. For example, in their Comprehensive Development Master Plan, Miami-Dade County has depicted potential redevelopment areas many of which are close to US-1. Redevelopment projects near the FEC Railway corridor include:

  - In 2005, the Oakland Park City Commission approved the creation of a Mixed Use Land Development Ordinance that encourages a mix of uses and a maximum allowable density of 30 dwelling units per acre with a maximum floor area ratio of 2.0 for commercial uses along the major transit corridors of Federal Highway, Oakland Park Boulevard, and Commercial Boulevard.[4]

[4] City of Oakland Park: Response Letter to AN. John Stunson, City Manager; 3/21/06.

- There is a City of Oakland Park CRA that contains a large transit-dependent population in terms of age and income:
  - 70% of students in the two elementary schools located within the CRA participate in the free lunch program.
  - 28% of residents are without high school diplomas.
  - 74% of households are rental.
  - Median household income (MHI) is 20% below the county's (Broward) MHI.
  - 179 Section 8 housing units.
- Delray Beach developers are planning several residential properties along the FEC Railway in the Pineapple Grove District.
- Wilton Station in Oakland Park is a mixed use development under construction next to the FEC Railway.
- In Fort Lauderdale alone, hundreds of high-rise apartments and condominiums are planned or are under construction within walking distance of the FEC Railway. Large scale development of office buildings, high rise residences, entertainment complexes, and restaurants is occurring in Downtown Fort Lauderdale, and was spurred on by the development of Riverwalk, the Broward Center for the Performing Arts, and upgrades to infrastructure and public areas.
- The FEC Corridor Strategic Redevelopment Plan (April 2002), developed for the City of Miami, recommends the development of a premium transit system utilizing the existing spine of the FEC Railway Corridor and its right-of-way. The transportation strategy is predicated on the vision that the FEC Railway Buena Vista site will be redeveloped into a high density, transit-oriented, urban "mid-town" center and that the larger corridor, distinguished by the Design District as well as the Arts and Entertainment Districts, along with Little Haiti, will become growing magnets for businesses, entertainment, and tourism. The redevelopment concept for the FEC Railway Buena Vista site was to extend the existing grid street system located south of 36th Street and west of North Miami Avenue through the entire site creating a pedestrian-oriented street pattern. That would facilitate a vibrant, mixed-use district consisting of a combination of commercial, residential, and light manufacturing loft space with accommodations for an urban design treatment of big box retail development (City of Miami Department of Economic Development).
- FEC Railway and rebirth of Park West, overlooking Bicentennial Park in Downtown Miami (Miami CRA and City of Miami Department of Planning and Zoning).

- The City of Hollywood Downtown redevelopment is primarily adjacent to the FEC Railway and includes the Hollywood Station mixed use development as well as other condominium developments along Young Circle within ¼ mile distance of the FEC.

- Land economics, transportation improvements, and multi-modal transit centers have created opportunities for increased concentrations of development throughout Miami-Dade County. Multi-story private developments have been constructed in the vicinity of Overtown, Brickell, Douglas Road, South Miami, Dadeland North and Dadeland South Metrorail Stations.

- **Displacement and Relocation of Existing Land Uses:** In Miami-Dade County, FEC Railway freight operations are minimal south of NE 71st Street. In fact, an FEC Railway yard in the City of Miami along the corridor was recently sold and is currently being constructed as a 50 acre mixed use development with retail, residential and other uses. Because of the FEC Railway corridor's minimal use for freight, the proximity of the area to the Miami CBD, and the increased land values, many of the existing industrial land uses are no longer viable for the area. Therefore, these land uses will probably continue to be displaced and converted to other uses.

- **Future Land Uses:** Future land uses are projected to change as the area around the FEC Railway has been receiving intense redevelopment pressure, particularly with land uses changing from low to high intensity residential and commercial centers. **Table 3.4** illustrates that residential land use is forecast to remain the primary land use within study area lands (compare to **Table 3.2** for existing land use), followed in the future (year 2050) by the following trends: urban/commercial supplants natural lands for second rank (as in existing condition), transportation replaces urban/commercial for third rank, natural land cover falls from second to fourth rank in percentage land cover. Little change is anticipated in fifth ranked recreation; however sixth-ranked agricultural activities are anticipated to virtually disappear. **Figures A.10 – A.13** (Appendix A) illustrate the existing land use by study region.

Table 3.4: SFECCTA Future Land Use (2050)

	Residential	Urban and Commercial	Parks and Recreation	Agricultural	Natural Land Cover	Transportation
Study Area Lands	45.20%	21.51%	5.18%	0.01%	10.35%	17.75%

Source: SFWMD, 1999
Residential = low, medium, and high density single family and multiple dwelling units; mobile homes.
Urban/Commercial = commercial services; shopping centers; junk yards; oil and gas storage; cemeteries; industrial; institutional, governmental; tourist services; religious; medical and healthcare; military, and educational facilities.
Recreation = beaches; golf courses; race tracks; marinas; parks and zoos; stadiums; open land.
Agricultural Land = improved pastures; row and field crops; fruit orchards; tree nurseries; ornamentals.
Natural Land Cover = reservoirs; lakes; natural streams, rivers, and waterways; channelized waterways and canals; habitat types (e.g., Australian pine); disturbed undeveloped land.
Transportation = communication and utility facilities; airports; railroads and rail-yards; roads and highways; ports; parking facilities.

3.3.2. Environmental Consequences

- **Land Acquisition:** Local governments in the study area are currently buying property within the study area to facilitate redevelopment opportunities. As part of this process, information was collected regarding public lands owned within the study area. These parcels would be targeted for any potential station area opportunities. The FDOT would work with the local governments and communities within segmental Tier 2 NEPA study areas, once a preferred alternative is selected as a result of the more detailed Tier 2 analyses within each segment, to identify opportunities for land acquisition that minimize impacts on established residential neighborhoods.

- **Redevelopment projects near the FEC Railway corridor:** Any of the alternatives under consideration will continue to support the redevelopment efforts currently being undertaken by the local governments adjacent to the FEC Railway corridor. The impact of the alternatives may be to accelerate the market conditions that are already happening in the South Florida area with respect to redevelopment. This is a regional benefit in that it supports the urban infill and redevelopment goals in the Eastward Ho! Study for the eastern portions of the Tri-County Area. Although in general redevelopment increases tax base and provides new opportunities for jobs and housing, sensitivity to existing neighborhoods in the area should be a requirement in the continued redevelopment efforts.

- **Displacement and Relocation of Existing Land Uses:** Conversion of existing land uses may accelerate should transit passenger service be established along the FEC Railway. Residential land use displacement or relocation is more probable at potential station and grade separation locations than along the rest of the FEC Railway corridor. Similarly, the commercial land uses in Broward to the north and south of FLL will probably remain as they are now except at potential station locations where opportunities for redevelopment exist. North of FLL, there are communities such as Wilton Manors and

Oakland Park that are preparing plans for redeveloping and relocating land uses along the FEC Railway corridor to accommodate more of a mixed use character.

Displacement and relocation of existing land uses appears to be happening already along the corridor, however, passenger service along the SFECCTA corridor may accelerate these developing plans. In Palm Beach, as the adjacent corridor areas are already predominantly residential, changes in land use are not occurring similar to those occurring in Broward and Miami-Dade. In this respect, special attention would need to be given along the corridor in Palm Beach to assure minimal displacement of the existing residential uses. Many more displacements and relocations are indicated for the US-1 and I-95 alternative alignments than for the FEC Railway alignments due to the available railway right-of-way held by FEC Industries and the dense, high value real estate along much of the roadway alignment right-of-ways.

There are several scenarios regarding displacements and relocation of tenants (commercial or residential) that may be anticipated as a result of providing premium transit services in the SFECCTA corridor:

- **Direct Displacements/Relocation:**

  - **Extending Tri-Rail up I-95 in northern Palm Beach County,** which is one alternative being considered that represents the worst case scenario for right-of-way acquisition (with associated impacts) since new rail construction would most likely be necessary outside the right-of-way. This is anticipated due to lack of available space to accommodate heavy rail tracks at-grade neither within the I-95 interchanges nor in the medians. Ten miles of very expensive rail viaduct to accommodate Tri-Rail Transit would be necessary to avoid displacements. The resultant displacement and necessary relocation of residents would also put elevated rail transit next to residents that previously were buffered from those displaced homes adjacent to that side of I-95.

  - **Station Locations** would have the potential for direct displacements or relocations if available right-of-way or land parcels in public holding are not sufficient for necessary amenities such as parking, shelters, or associated TOD features. These impacts are anticipated to be greatest along US-1 and I-95 since there is not sufficient right-of-way to avoid significant amounts of right-of-way acquisition for these facilities along these roadways.

  - **O&M Facilities** are another potential cause of displacements or relocations.

  - **Substandard FEC Railway right-of-way locations** (less than 100 feet width) have been identified with adjacent developed parcels that could be directly impacted by additional track construction and/or utility relocations.

- **Grade separation at railroad crossings** will directly impact adjacent properties to accommodate the elevated roadway.

➢ **Indirect Displacements/Relocation**

- Increased Rental Prices due to higher land values adjacent or near premium transit services (focused on but not exclusive to station locations).
- Increased Property Values and associated home ownership costs.
- Intensified developer activity converting existing land uses to redeveloped properties at higher market values than the current population may be able to afford or even desire.
- Loss of access due to embankment at grade separators.

These indirect displacement/relocation issues can be described as induced relocation, and would necessarily be an important component of socio-cultural effects assessments in the independent Tier 2 segmental NEPA studies.

➢ **Future Land Uses:** The primary effect that new premium transit services along the SFECCTA corridor is anticipated to have is at proposed station location areas that will have TOD and/or joint development associated with them. These impacts are anticipated to be greatest along US-1 and I-95 since there is not sufficient right-of-way to avoid significant amounts of right-of-way acquisition for these facilities along these roadways. There are benefits and potential adverse effects with such land use changes. Opportunities for improving existing, or providing new, affordable or workforce housing may be created as partnerships form between local governments desiring new transit stations and the premium transit service providers during Tier 1 and the Tier 2 studies to occur for areas located within or between these local communities.

3.4. Historic, Archaeological, and Cultural Resources

3.4.1. Affected Environment

According to a review of the Florida Master Site File (FMSF) database and Florida Geographic Data Library (FDGL) GIS data layer, there are approximately 140 previously recorded archaeological resources and over 15,000 previously recorded historic resources within one mile of both sides of the project corridor. Two State Historic Highways exist within the study area boundaries: Calle Ocho/SR 90/SW 8th Street in Miami-Dade County and North Ocean Boulevard/SR A1A in Broward County. Approximately 150 potentially National Register of Historic Places (NRHP) eligible, determined NRHP-eligible, or NRHP-listed resources have also been identified within the study area. Approximately 28 potentially historic

bridges and 43 other cultural resource groups (i.e., archaeological, historical, and/or architectural) are located within the SFECCTA study area, as outlined in **Tables A.5 – A.6** (see Appendix A).

3.4.2. Environmental Consequences

Due to the vast numbers of potentially historic structures (including bridges) and sites, historic and archaeological districts and zones, documented and undocumented archaeological sites, a Tiered approach to cultural resources is appropriate for the SFECCTA. This involves a Tier 1 "reconnaissance level survey" to be followed by subsequent, incrementally more detailed Tier 2 Cultural Resource Assessment Surveys (CRAS) in the independent Tier 2 segmental NEPA studies. Coordination with local historic preservation entities will also be incorporated in Tier 2 when there is more definitive information on alternatives and potential impacts to resources. Although there were no comments on Historic and Archaeological Sites in the ETDM review of the AN, the FDOT Summary Response to the ETAT assigned a degree of effect of "moderate" citing the extensive amounts and variety of historic and archaeological resources in the corridor. It was stated in the summary response that a corridor-level analysis of cultural resources will be conducted for this project to capture the historic significance of all identified resources and any newly designated historic properties within the project area. The reconnaissance level survey accomplishes the corridor-level analysis of cultural resources in Tier 1.

The above methodology was described in the AN circulated for this project as beginning in Tier 1 with an extensive initial records search coupled with a judgmental reconnaissance, or "windshield survey", by driving along the more than 200 square miles that comprise the SFECCTA study area. The February 20, 2006 SHPO reply to the AN containing this methodology was "No Comment/Consistent" and is contained in the Appendix F – State Agency Correspondence. A meeting was held on June 9, 2006 in Tallahassee with the same SHPO staff that replied to the AN in order to coordinate the cultural resources methodology for the SFECCTA. As a result, a Cultural Resources Reconnaissance Study Report has been prepared and will be reviewed by SHPO in Tier 1. It is anticipated that the SHPO review of this report will result in a letter that states this level of assessment and the report documentation appears to be complete and sufficient for Tier 1 screening of cultural resources and that SHPO will continue coordinating on SFECCTA studies during Tier 2 when the CRAS reports on individual project studies will be produced. Any SHPO letters will continue to be appended to the DPEIS and/or the Final PEIS. This tiered methodology for cultural resource assessment in the SFECCTA is outlined below:

Tier 1 Methodology:

- Conduct Extensive Background Research: previous cultural resources studies, GIS data, FSMF information.

- Employ a Judgmental Reconnaissance or “Windshield” Survey methodology throughout the SFECCTA study area to visually identify NRHP listed, those determined to be NRHP-eligible, or potentially NRHP-eligible resources and districts.
- Results:
  - Cultural Resources Reconnaissance Study Report.
  - SHPO letter.

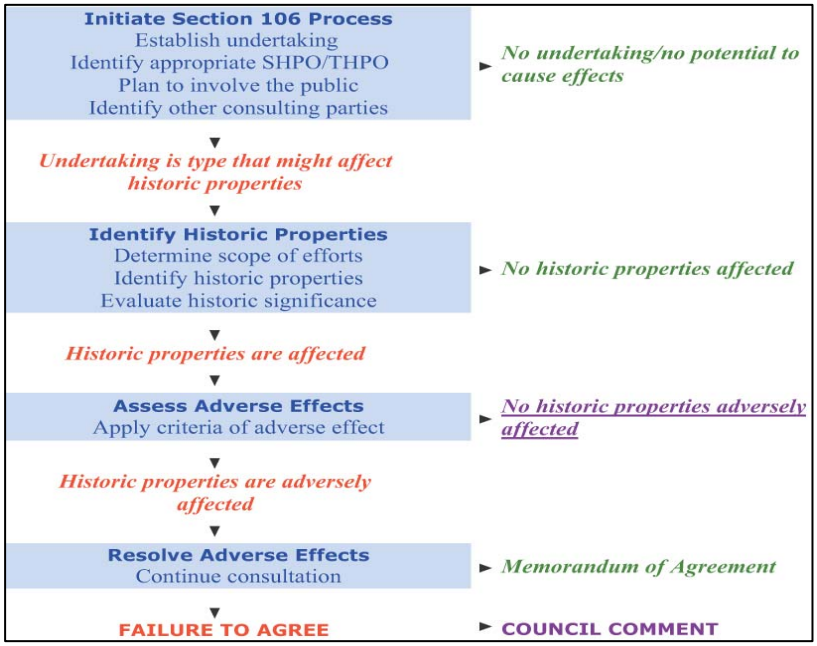
Tier 2 Methodology:

Section 106 Process

- Establish Area of Potential Effect (APE) for each preferred alternative within each Tier 2 project segment.
- Identify and evaluate resources-CRAS report, FMSF forms in each segmental project concurrent with AA/NEPA study.
- If resources are found NRHP-listed or eligible:
  - Prepare case study.
  - Assess effects.
  - SHPO coordination.
  - Public involvement.
  - Develop avoidance, minimization, and mitigation strategies, if needed.

The Section 106 Process can be illustrated in **Figure 3.2**. A Cultural Resources Reconnaissance Study has been prepared for the Tier 1 Section 106 assessment of the SFECCTA and is available upon request.

Figure 3.2: Section 106 Process Flowchart



The tiered survey and documentation approach was coordinated with the SHPO in Tallahassee on June 9, 2006. In addition, GIS analysis of these resources along the proposed alignment options was conducted. No involvement is anticipated under any proposed alternatives with the two State Historic Highways Calle Ocho/SR 90/SW 8th Street in Miami-Dade County and SR A1A/North Ocean Boulevard in Broward County. The preliminary results of the assessment are included in **Table 5.3** as evaluation criteria in Section 5.1.2, Comparative Benefits and Environmental Effects.

It must be noted here that while the GIS analysis has identified historic sites and structures, archaeological resources, and other cultural resources, these are not necessarily adjacent to the facility or documented as significant resources. For example, it is standard practice to identify potentially historic resources based solely on age and delegate the investigative work necessary to document integrity, setting and locale on the resources or resource groups to the segmental NEPA studies. Then the project study provides the SHPO the CRAS prior to that agency issuing a letter of effect or letter of no effect for the proposed project. This process will be followed for those project alternatives promoted from Tier 1 and studied in Tier 2 segmental projects. Noise and vibration effects are also anticipated to be assessed with respect to potentially historic resources in Tier 2.

It is also important to note that historic linear resources that will require further research and documentation during the Tier 2 phase were encountered during the reconnaissance survey. These include potentially significant roadways, canals, and railroad corridors such as the FEC Railway, US-1,

Dixie Highway, Miami Canal, and other major canals related to the Everglades Drainage District. Due to the nature of these resources types and the major intent of this phase of the project, they are not included in the tables but as mentioned previously, they will be covered more thoroughly in Tier 2. On June 9, 2006 a meeting was held with Sherry Anderson, SHPO representative, in order to discuss historic linear resources related to this project. It was established that until more specific information about the types of improvements that may effect historic linear resources is determined, a definitive approach for Tier 2 cannot be developed at this time. In addition, the FDOT Environmental Management Office, in conjunction with FHWA, is currently working on specific cultural resources issues including historic linear resources. It is possible a protocol for the identification, documentation, and evaluation of such resources will be in place for the Tier 2 cultural resources studies.

3.5. Visual and Aesthetic Qualities

3.5.1. Affected Environment

The majority of the landscape within the corridor could be classified as mixed use (e.g., residential/commercial/industrial) with large expanses of residential communities interspersed with front row (i.e., adjacent to the existing railway or roadway facility) commercial and/or industrial land uses. However, there are portions of the corridor with open green space (e.g., golf courses, parks).

- **Scenic/State Historic Highways:** According to GIS review of the FGDL data layers on Scenic and State Historic Highways, there are two proposed (2004) scenic highways within the SFECCTA corridor which are state owned: **(1)** SR A1A/North Ocean Drive (including the East Dania Beach Boulevard east-west SR A1A segment) located in south Broward County and **(2)** SR A1A/Seabreeze Boulevard located just north of PEV. There are also two designated State Historic Highways in or near the SFECCTA study area: Calle Ocho/SR 90/SW 8th Street in Miami-Dade County and SR A1A/North Ocean Drive (same as Scenic Highway above) in Broward County.

3.5.2. Environmental Consequences

Both from a user and viewer perspective the view-shed is impacted from different perceptions. From a user point of view, the view-shed may be impacted in a positive matter. For example, elevated structures within the corridor may provide a heightened, enhanced view of the surrounding landscape, hence, a user might benefit visually from the changes made within the corridor. On the other hand, a viewer or individual with an “outside looking in perspective” may see a negative impact because their view-shed is partially or totally hindered by elevated structures or other facilities that are erected within the corridor. In general, there are several aspects and key considerations regarding visual and aesthetic qualities that are yet to be assessed; however, as the project moves forward these issues will be taken into account and addressed further in the Tier 2 segmental NEPA studies.

- **Scenic/State Historic Highways:** Overall, little to no impacts are expected to result from proposed improvements (to be studied in Tier 2) to the scenic highways within the corridor. No involvement is anticipated under any proposed alternatives with the two State Historic Highways described in Section 3.5.1 above, Calle Ocho/SR 90/SW 8th Street in Miami-Dade County and North Ocean Drive/SR A1A in Broward County.

3.6. Parklands and Recreation Areas

3.6.1. Affected Environment

- **Section 4(f) Protected Resources:** A preliminary survey of the entire SFECCTA study area reveals approximately 391 State Parks, Miami-Dade County Parks, Broward County Parks, Palm Beach County Parks, municipal parks, memorial parks/cemeteries, golf courses/country clubs (public and private), and protected/conservation lands and/or environmental/conservation easement areas that occur in proximity to the project corridor. Consideration of the potential involvement of Section 4(f) protected resources will be included in the SFECCTA, initially by a screening analysis identifying sites that are adjacent or in close proximity to the FEC Railway and/or nearby parallel streets under consideration as alternative alignments. Some of these sites are also historic or contain historic, archaeological, or other resources that are protected by Section 4(f), as well as Section 106 of the National Historic Preservation Act (NHPA) of 1966 (Public Law 89-665, as amended) and its implementing regulations (36 CFR 800), Executive Order 11593, Chapter 267 FS, and Chapter 872 FS. These resources include, but are not necessarily limited to the following facilities or sites in **Tables A.7 – A.12** located in Appendix A. **Figures A.14 – A.17** (Appendix A) illustrates state, county and city owned parks within the two mile wide study area (No National Parks or National Wildlife Refuges within the study area).

- **Pedestrian/Bicycle Facilities:** Pedestrian and bicycle modalities are severely limited in much of the SFECCTA study area due to its urbanized and heavily industrialized nature. The existing FEC Railway has 14 roadway/pedestrian bridges that cross over it. In some neighborhoods such as Overtown in the Miami CBD, there is a substantial amount of pedestrian traffic across the tracks and at-grade roadway crossings. Recognizing this need, some provision for pedestrians and bicycles are being planned in such projects as the Flagler Trail Greenway in Miami-Dade County and the Dixie Highway Trail Greenway along the FEC Railway/Dixie Highway corridor throughout Broward County. If pedestrian/bicycle routes are closed or otherwise modified, these will be identified and the potential impacts on community mobility and neighborhood interaction will be addressed.

3.6.2. Environmental Consequences

- **Section 4(f) Protected Resources:** Since the transit alternatives are being evaluated for utilization of primarily existing railway and roadways, there is little likelihood of direct impact to any Section 4(f) protected resources. However, the preliminary evaluation of alternatives and station location or O&M facility siting "fatal flaw" analyses catalogued such resources for comparative purposes. Direct acquisition can be avoided best through this early identification in Tier 1. Indirect effects due to proximity effects of locating transit facilities adjacent to Section 4(f) resources may need to be assessed in Tier 2 segmental NEPA studies for constructive use issues as part of Section 4(f) Determination of Applicability or Section 4(f) Evaluations. These evaluations may be Programmatic Section 4(f) Evaluations, depending on coordination with entities with jurisdiction over the Section 4(f) resources and the lead federal agency on the individual Tier 2 NEPA study or studies involving the resource(s). A screening evaluation considered Section 4(f) resources such as Parks and Recreation, Greenways and Trails, Conservation Lands and Wildlife Refuges located within 400 feet to either side of each proposed alternative, and is included in the Cultural Resources Evaluation Criteria of **Table 5.3** in Section 5.1.2 Comparative Benefits and Environmental Effects. However, little potential for right-of-way acquisition from any Section 4(f) resources adjacent to SFECCTA alternative alignments is anticipated at this Tier 1 assessment.

- **Pedestrian/Bicycle Facilities:** The inclusion of pedestrian and/or bicycle facilities within the SFECCTA study area is one of the goals of the ultimate transit project. Consideration in Tier 2 of such facilities can include bicycle storage areas at stations and potential bicycle carrying capacity on the vehicles, as well as pedestrian/bicycle trails or paths. While the exact dimensions and locations of such storage/carrying facilities, trails or paths may not be feasible in Tier 1, they will certainly be examined closely and in coordination with local agencies in Tier 2 NEPA studies. If existing pedestrian/bicycle routes are closed or otherwise modified, these will be identified and the potential impacts on community mobility and neighborhood interaction will be addressed in Tier 2 as well.

3.7. Air Quality and Energy

3.7.1. Affected Environment

Overall, mass transit can improve air quality and reduce consumption of natural resources for energy. Fewer automobiles on the roadways will result in reduced emissions into the atmosphere, thereby improving air quality not only within the corridor, but regionally as well. The South Florida Airshed includes all of Miami-Dade, Broward and Palm Beach Counties. In 1990 the area was originally designated as a moderate non-attainment area with respect to meeting the national air quality standards. However, in 1995 the area was re-designated to attainment status, which meant that for a 20 year period

it must continue to demonstrate conformity through a Maintenance Plan and approved long range transportation plans. The Miami-Dade, Broward, and Palm Beach County 2030 plans have been approved and found to be in conformity with the Maintenance period requirements and are in conformance with the State of Florida's SIP. Environmental Consequences

3.7.2. Environmental Consequences

While more detailed air quality analyses during the Tier 2 segmental studies can be undertaken if necessary, all indications are that the project would have beneficial air quality impacts both locally and regionally by increasing transit use and reducing vehicular traffic. Transit is inherently more energy efficient than travel by single occupancy vehicle (SOV). By putting more commuters on transit, less energy is wasted on automobile fuel in SOVs and, in the case of electric powered transit technologies, the energy production is primarily conducted away from the congested commuting areas (Ft. Lauderdale's Port Everglades fossil fuel burning power plant is an exception in this study area). In general terms, grade-separated transit systems like Miami-Dade Transit commuter rail (Metrorail) or AGT (Metromover) systems are best for local air quality while on-street systems such as bus (BRT, Intercity Motor Coach, or RGB) or even electric rail systems (such as LRT or Streetcar systems operating in mixed traffic) are less beneficial due to potential impacts to local street network congestion.

The Florida Department of Environmental Protection (FDEP) requested more air quality information upon review of the AN description of the air quality screening procedure of identifying sensitive receptors along the SFECCTA alternative corridors. The FDEP made this request regarding air quality through the ETDM process, specifically inquiring which air pollutants would be collected and if computer modeling air impacts would be conducted. It has been determined that modeling is not appropriate at Tier 1 but may be incorporated into the independent Tier 2 segmental NEPA studies. The FDOT Summary Response to the ETAT agreed with and confirmed the degree of effect for air quality assigned by the FDEP ETAT reviewer as "minimal" effect, stating that the project is in a U.S. Environmental Protection Agency (USEPA) designated airshed for the air pollutant ozone, and that the project is part of approved LRTPs and consistent with the TIPs for the three counties in the SFECCTA study area.

3.8. Noise and Vibration

3.8.1. Affected Environment

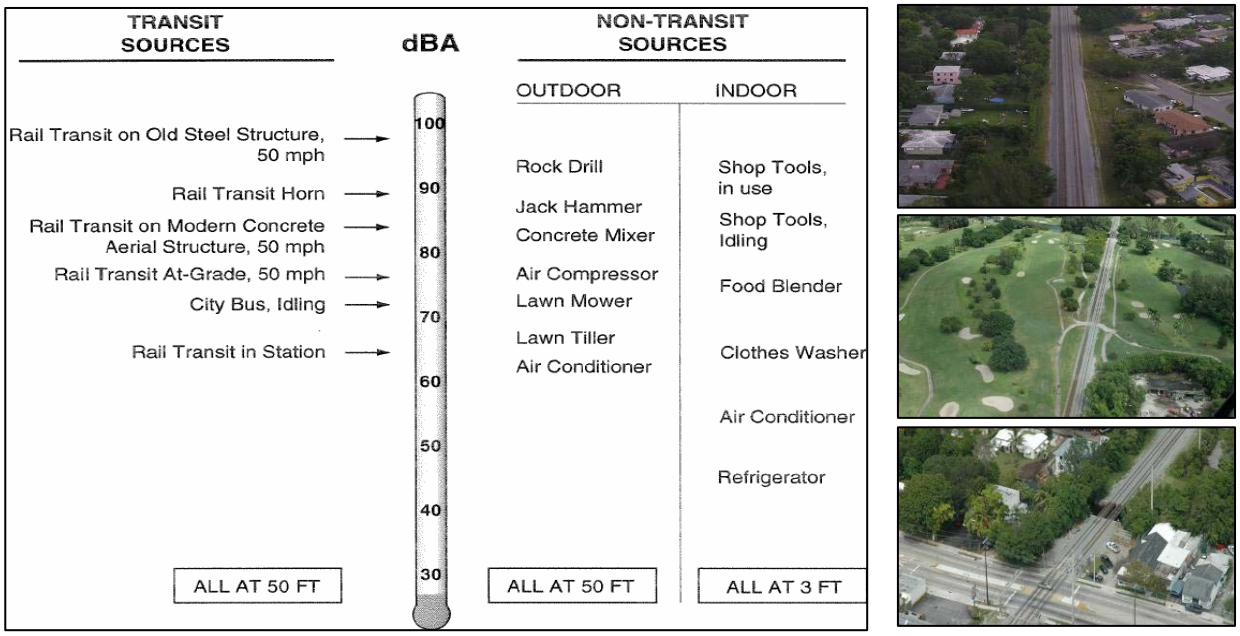
- **Noise:** A preliminary noise assessment along the proposed project corridor revealed existing noise sensitive land use consisting of residential areas, schools, and other noise sensitive receivers. Future land use may also include high density multifamily and single-family residential development typical of that found in eastern Miami-Dade, Broward, and Palm Beach Counties, particularly around the rapidly

redeveloping CBDs. The MidTown Miami development at the former Buena Vista FEC Railway yard is a prime example of mixed use, TOD currently under construction in the SFECCTA study area, and is anticipated to be emulated in others areas within the corridor such as in West Palm Beach. The typical noise levels associated with noise from rail transit and freight trains are illustrated in **Figure 3.3** (as well as example noise sensitive adjacent land uses along the FEC Railway right-of-way). It is important to note that rail transit is typically about 20 decibels (measured as dBA, or A-weighted dB, which most closely approximates noise levels as perceived by the human ear) quieter than freight trains with single diesel engines. Freight trains are not only louder than transit trains but they are generally longer in duration as they pass by noise sensitive sites than the typically shorter, faster transit trains. Furthermore, the FEC Railway currently uses triple locomotives (see Photo 3 in **Figure 1.4**) and runs a current average of 26 daily trains that is anticipated to increase.

Train horns (also known as “whistles”) are another railroad noise source issue that is of tremendous concern in communities along the FEC Railway. This issue has been made evident in past studies and actions, as well as throughout this study’s public involvement and scoping process beginning with the circulation of and response to the AN, throughout the municipality or agency scoping meetings, and in the public meetings and workshops. This is closely related to public safety at roadway crossings of railways (especially those with at-grade, or “highway-rail grade” crossings) that is in itself a very sensitive issue for this densely populated and highly utilized corridor, just as it is for other rail/transit corridors nationally. An SFECCTA assessment of train horn noise should consider the current freight traffic, potential growth in freight train occurrences (with associated train horn blowing), potential addition of new transit rail along the FEC and/or SFRC, and past history in this corridor with restrictions on train horns.

The train horn noise restriction issue is not new, as back in the mid 1980s a “whistle ban” was allowed by the FRA for freight trains in Florida. Effective July 1, 1984, local jurisdictions throughout Florida were allowed to establish nighttime (10:00 p.m. to 6:00 a.m.) train whistle bans according to Florida Statute No. 351.03. Established by local jurisdictions adjoining the FEC Railway (beginning with Miami-Dade County and eventually incorporating the entire length of the FEC Railway within and north of the SFECCTA study area), the whistle bans only applied to certain crossings on the FEC Railway. Pursuant to Florida Statute (F.S.) 351.03, in order for crossings to be eligible for train whistle bans, they must have been equipped with active warning devices. This meant that all affected highway-rail grade crossings were required to be equipped with crossing gates, flashing lights, bells, and special highway advance warning signs. Train whistles were banned at night primarily to eliminate the noise impacts they had on adjacent and nearby residential communities.

Figure 3.3: Comparative Noise Levels and Noise Sensitive Areas



However, since safety concerns generally prevail over noise concerns in FRA policy, an investigation of the effects of the nighttime whistle ban along the FEC Railway was conducted. The FRA study revealed that FEC Railway's nighttime accident rate at affected crossings nearly tripled after whistle bans were imposed. The daytime accidents at affected crossings remained virtually unchanged. In contrast, nighttime accidents increased 23 percent at 89 FEC Railway crossings where there were no bans. Based on the above statistics reported in Florida's Train Whistle Ban, (USDOT, FRA, Office of Safety, Final Edition, September 1995), FRA concluded that nighttime whistle bans at impacted crossings cause significant increases in public highway-rail crossing accidents.

Following its investigation of accidents attributable to the FEC Railway whistle ban, FRA issued Emergency Order No. 15 on July 26, 1991. This decision required the FEC Railway to sound train whistles, a.k.a. locomotive horns when approaching public highway-rail crossings. Specifically, FEC Railway was ordered to follow the operating rules governing horn use that were in effect before the state-permissive train whistle ban. In the study leading up to Emergency Order No. 15, the FRA recognized that nighttime train whistles (i.e., locomotive horns) can be an inconvenience to residents near the railroad right-of-way. However, these same locomotive horns can also save lives.

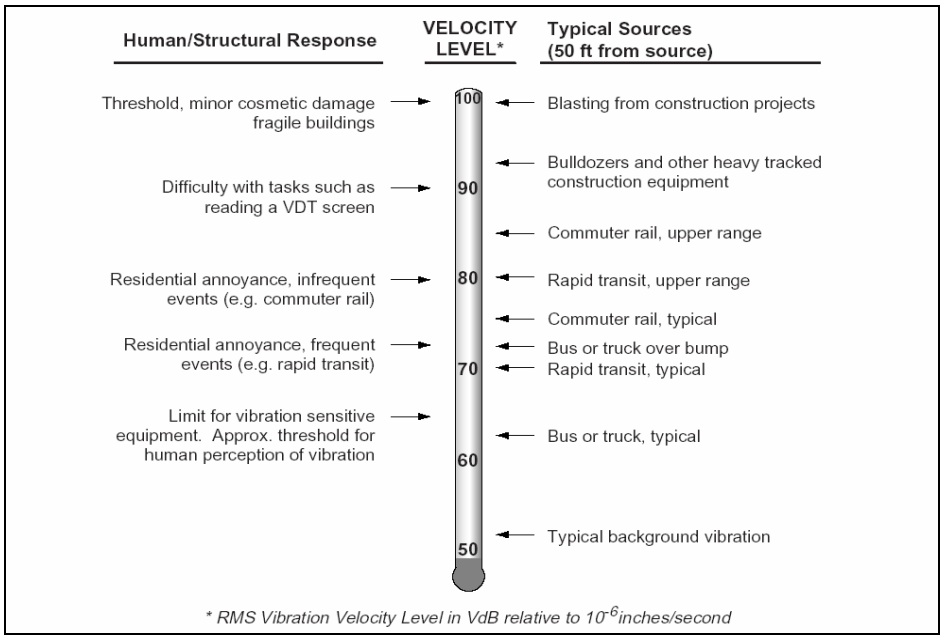
Recent policy is shifting towards allowing limited, more regulated noise control on railway corridors. Effective June 24, 2005 FRA published 49 Code of Federal Regulations (CFR) Parts 222 and 229, Use of Locomotive Horns at Highway-Rail Grade Crossings; Final Rule (Federal Register, April 27, 2005). The final rule followed an extensive public comment period after the publication of an interim final rule on December 18, 2003, in which FRA required that the locomotive horn be sounded while trains

approach and enter public highway-rail grade crossings. The interim final rule contained an exception to the above requirement in circumstances in which there is not a significant risk of loss of life or serious personal injury, use of the locomotive horn is impractical, or safety measures fully compensate for the absence of the warning provided by the locomotive horn. Communities that qualify for this exception may create ‘‘quiet zones’’ within areas which locomotive horns would not be routinely sounded. The final rule amends certain provisions of the interim final rule to facilitate the development of quiet zones, while balancing the needs of railroads, states, and local communities.

- **Ground-borne noise and vibration:** A preliminary assessment GIS screening of potential ground-borne noise and vibration effects was undertaken in Tier 1 to identify project alternatives that have little possibility of creating significant adverse impacts. Existing sensitive land uses consisting of residential areas, schools, medical, research, and other receivers were identified and documented in the project GIS database. Future land use may also include high density multifamily and single-family residential development typical of that found in eastern Miami-Dade, Broward, and Palm Beach Counties, particularly around the rapidly redeveloping CBDs. The proposed Scripps Bio-Medical Research developments in various portions of northern Palm Beach County is a prime example of medical, life science research development currently proposed in the SFECCTA study area, and is anticipated to be emulated in other parts of the study area such as in Miami (the University of Miami Bio-Medical Research Center adjacent to I-95 at the Miller School of Medicine/Jackson Memorial Hospital Center). Typical vibration levels (measured as vibration velocity level in decibels, or VdB) associated with rail transit are illustrated in **Figure 3.4** below.

It is important to distinguish ground-borne noise from ground-borne vibration when analyzing the effects rail transit has on the human environment. Ground-borne noise is usually perceived as the rumbling sound (and/or rattling of windows or wall hangings) caused by the vibration of room surfaces from ground-borne vibration. The annoyance potential of ground-borne noise is usually characterized with the A-weighted sound level. This is a complex phenomenon that requires detailed assessment appropriate in Tier 2 following guidance provided in FTA Transit Noise and Vibration Impact Assessment, Report FTA-VA-90-1003-06 (May 2006, Harris Miller Miller & Hanson, Inc.). This manual is available for download on the project website documents section (http://www.sfeccstudy.com/images/FTA_Noise _and_Vibration_Manual.pdf)

Figure 3.4: Ground-Borne Noise and Vibration Levels Human/Structural Responses



3.8.2. Environmental Consequences

- **Noise:** The Palm Beach MPO commented on the project in ETDM that in order to address added noise that may effect the community, consideration may be given to enhancing the corridor with shrubs, trees or other landscaping that may help absorb noise and enhance the corridor's viewshed. The FDOT Summary Response to the ETAT agreed with and confirmed the degree of effect for aesthetics (the portion of the ETDM reports pertaining to noise impacts) as "substantial". The summary response agreed that consideration may be given to enhancing the corridor with shrubs, trees or other landscaping that may potentially absorb noise.

  A preliminary assessment of potential noise effects on the communities in the SFECCTA study area has been undertaken as part of Tier 1. This assessment was primarily a GIS analysis of land use, given the length of the corridor (85 miles long north to south, 100 miles with the potential connection to the MIC at MIA) and numerous residential communities (study area involves a total of 47 cities, 28 directly on the FEC Railway, see **Table 1.1** in Chapter 1.0 or **Table A.1** or **Figures A.2 – A.5**, Appendix A). The potential for noise increases due to introducing transit within the SFECCTA corridor is anticipated to be greatest for new rail on the FEC Railway. Roadway transit alternatives for this corridor would likely be rubber tired bus technology that would not be as likely to increase noise in as substantial a manner as rail transit may. Therefore it is important to note that the freight rail is the predominant noise source on the FEC Railway, and freight transport is anticipated to grow (FEC Industries, like most rail freight operators, does not do projections beyond several years in the future). For comparison, transit train frequency on the FEC Railway may be similar to what Tri-Rail is currently

running (40 now, 48 daily trains once the current double track project is complete), although service determinations may not be available until the end or Tier 1 or in Tier 2 studies.

The methodology employed was a screening procedure that follows FTA Transit Noise and Vibration Impact Assessment, Report No. FTA-VA-90-1003-06 (May 2006, Harris Miller Miller & Hanson, Inc.; www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf) by taking a conservative distance from an alternative alignment (the FEC Railway, SFRC/Tri-Rail, or roadways such as US-1 or I-95) and cataloguing noise sensitive land uses, as categorized in **Table 3.5** below:

Table 3.5: Noise Sensitive Receptor Categories

	Noise Sensitive Sites ("Receptors") in these categories
Category 1	Parks, Outdoor amphitheaters and concert pavilions, Residential areas. National Historic Landmarks (with significant outdoor use).
Category 2	Homes, hospitals and hotels/motels (buildings where people normally sleep) Historical sites currently used as residences.
Category 3	Schools, Libraries, Religious worship buildings (churches, synagogues, mosques, etc.), Auditoriums (or other institutional land uses with primarily daytime use), Medical offices, Recording studios or concert halls, Cemeteries, monuments, museums (locations for meditation or study) Historical sites, parks and recreational facilities (certain types).

Source: FTA Transit Noise Vibration Impact Assessment Manual, 1995. HMMH, Inc.

Table 3.6: Screening Distances for Noise Assessments

Type of Project		Screening Distance* (ft)	
		Unobstructed	Intervening Buildings
Fixed Guideway Systems:			
Commuter Rail Mainline		750	375
Commuter Rail Station		450	225
Rail transit Guideway		700	350
Rail Transit Station		200	100
Access Roads		100	50
Low- and Intermediate Capacity Transit	Steel Wheel	200	100
	Rubber Tire	125	75
	Monorail	300	150
Yards and Shops		2000	1000
Parking Facilities		150	75
Access Roads		100	50
Ancillary Facilities			
Ventilation Shafts		200	100
Power Substations		250	125
Bus Systems:			
Busway		500	250
Bus Facilities	Access Roads	100	250
	Transit Mall	250	125
	Transit Center	300	150
	Storage & Maintenance	1000	500
	Park & Ride Lots	300	150

* A "critical distance" measured from centerline of guideway/roadway for mobile sources; from center of noise-generating activity for stationary sources within which noise-sensitive receivers are anticipated to be impacted.

Source: FTA Transit Noise Vibration Impact Assessment Manual, 1995. HMMH, Inc.

The screening procedure used a conservative offset distance of 800 feet centered on each alignment and tabulated the numbers of noise sensitive sites or areas (utilizing the heaviest transit technology of Commuter Rail, as shown in **Table 3.6**). The screening distance concept utilizes a "critical distance" that is defined as an offset from the noise source wherein any receivers are within a distance where impact is likely to occur. The total number of noise sensitive receptors that were found (all categories combined) for each alternative was considered as an evaluation criteria for alternatives analysis in Section 5.0 below. The train horn noise issue is another aspect that is also closely linked to the freight trains and to the high number of railroad crossings throughout the SFECCTA corridor. General noise assessments or detailed noise studies (as outlined in FTA Transit Noise and Vibration guidance) will be conducted as appropriate in Tier 2 segmental studies. Furthermore, a program of railroad crossing consolidation and/or overpass studies may also be implemented beginning with Tier 1 and continued if not accelerated in Tier 2 in order to address concerns of safety, quality of life in SFECCTA

communities, and rail service. The FDOT has implemented a Quiet Zone application approach for communities in "Use of Locomotive Horns at Highway-Rail Grade Crossings; Interim Final Rule. 49 CFR Parts 222 & 229", February 25, 2005. This document is available upon request.

- **Ground-borne noise and vibration:** The Palm Beach MPO commented on the project in ETDM that in order to address added noise and vibration that may effect the community, consideration may be given to enhancing the corridor with shrubs, trees or other landscaping that may help absorb noise and enhance the corridor's viewshed. The FDOT Summary Response to the ETAT agreed with and confirmed the degree of effect for aesthetics (the portion of the ETDM reports pertaining to ground-borne noise and vibration impacts) as "substantial". The summary response agreed that consideration may be given to enhancing the corridor with shrubs, trees or other landscaping that maintain an aesthetically pleasing corridor.

  As with the screening for airborne transit noise effects, a preliminary assessment (screening) of potential ground-borne noise and vibration effects on the communities in the SFECCTA study area has been undertaken as part of Tier 1. As a screening procedure, it was conducted to help identify project alternatives that have little possibility of creating significant adverse impact on communities, sites, or structures in the study area. This assessment was primarily a GIS analysis of land use, given the length of the corridor (85 miles long north to south, 100 miles with the potential connection to the MIC at MIA) and numerous residential communities (study area involves a total of 47 cities, 28 directly on the FEC Railway, see **Table 1.1** in Chapter 1.0 or **Table A.1** and **Figures A.2 – A.5**, Appendix A).

  New rail transit has the potential for increasing ground-borne noise and vibration. Roadway transit alternatives with rubber tired bus technology would not increase ground-borne noise and vibration in as substantial a manner as rail transit. Freight rail is the predominant source of ground-borne noise and vibration and freight transport is anticipated to grow. The magnitude of freight transport growth is not forecast as far in the future as roadway traffic volumes since FEC Industries, like most rail freight operators, does not do projections beyond several years in the future. However, for comparison purposes, transit train frequency on the FEC Railway may be similar to what Tri-Rail is currently running (40 now, 48 daily trains once the current double track project is complete), although service determinations may not be available until the end of Tier 1 or in Tier 2 studies.

  The methodology employed was a screening procedure that follows FTA Transit Noise and Vibration Impact Assessment, FTA Report FTA-VA-90-1003-06 (May 2006, Harris Miller Miller & Hanson, Inc.) by taking a conservative distance from an alternative alignment (the FEC Railway, SFRC/Tri-Rail, or roadways such as US-1 or I-95) and cataloguing land uses and individual sites that are particularly sensitive to ground-borne noise and vibration, as categorized in **Table 3.7**.

Table 3.7: Ground-Borne Noise and Vibration Sensitive Receptor Categories

Ground-Borne Noise and Vibration Sensitive Sites (Buildings/Structures)	
Category 1	Vibration sensitive research and manufacturing, including hospital operating theaters, laboratories, concert halls, etc.
Category 2	All residential buildings occupied and in use and all hotels/motels (Buildings where people normally sleep)
Category 3	Institutional buildings with sensitivity to vibration ("Special buildings")

Source: FTA Transit Noise Vibration Impact Assessment Manual, 1995. HMMH, Inc.

The screening procedure used an offset of 800 feet centered on each alignment (using the most conservative screening distance as shown in **Table 3.8** plus a margin of error estimated from examination of accuracy of the GIS rail and roadway layers utilized in the analyses) to tabulate the numbers of noise sensitive sites or areas. The screening distance concept utilizes a "critical distance" that is defined as an offset from the ground-borne noise or vibration source wherein any receivers are within a distance where impact is likely to occur. The total number of noise sensitive receptors that were found (all categories combined) for each alternative was considered as an evaluation criteria for alternatives analysis in Section 5.0 below. The train horn noise issue is another aspect that is also closely linked to the freight trains and to the high number of railroad crossings throughout the SFECCTA corridor. General noise assessments or detailed noise studies (as outlined in FTA Transit Noise and Vibration guidance) will be conducted as appropriate in Tier 2 segmental studies.

Table 3.8: Comparative Ground-Borne Vibration Levels

Type of Project	Critical Distance* for Land Use Categories** Distance from Right-of-Way or Property Line		
	Cat. 1	Cat. 2	Cat. 3
Conventional Commuter Railroad	600	200	120
Rail Rapid Transit	600	200	120
Light Rail Transit	450	150	100
Intermediate Capacity Transit	200	100	50
Bus Projects (if not previously screened out)	100	50	--

* "critical distance" is measured from centerline of guideway/roadway for mobile sources; from center of noise-generating activity for stationary sources within which vibration-sensitive receivers are anticipated to be impacted.
**The land use categories are defined in Table 3.7 above. Some vibration-sensitive land uses are not included in these categories. Examples are: concert halls and TV studios, which for the screening procedure, should be evaluated as Category 1; and theaters and auditoriums which should be evaluated as Category 2.
Source: FTA Transit Noise Vibration Impact Assessment Manual, 1995. HMMH, Inc.

It is not yet known if the more detailed Tier 2 assessments will be able to quantify if transit service implementation along the SFECCTA corridor will relieve noise levels along the surrounding roadways. However, providing options to driving automobiles on the roadways is anticipated to help stem the

growth in projected traffic volumes in this already congested roadway network. Therefore, even though improving LOS on roadways typically increases traffic noise levels, congestion on roadways in the SFECCTA study area is projected to increase in the future which may offset lower traffic volumes due to SFECCTA premium transit services. Assessment of noise level changes on surrounding roadways may only be possible in detailed Tier 2 noise studies that are conducted in concert between the independent but related Tier 2 NEPA studies.

3.9. Biological Resources

3.9.1. Affected Environment

- **Wetlands:** A preliminary GIS analysis of the SFECCTA study area, including one crossing of Biscayne Bay at the POM and numerous man-made canals (see Floodplains below), revealed over 1,000 wetland polygons included in the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) classification system. These NWI polygons are provided in Appendix A, by county in **Table A.13** and by study region in **Figures A.18 – A.21**. According to the NWI, the five major systems of wetlands include:

  - **Marine System,** consisting of the open ocean overlying the continental shelf and its associated high-energy coastline, exposed to waves and currents of open ocean, tidally influenced, and salinities exceeding 30%. Shallow coastal inundations or bays without appreciable freshwater inflow, and coasts with exposed rocky islands that provide the mainland with little or no shelter from wind and waves, are also included.

  - **Estuarine System**, deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but having open, partly obstructed or sporadic access to the open ocean, where ocean water is at least occasionally diluted by freshwater runoff from the land. Includes areas where Red mangroves (Rhizophora mangle) and eastern oysters (Crassostrea virginica) occur. Estuarine systems include both subtidal and intertidal subsystems.

  - **Riverine System,** includes all wetlands and deepwater habitats contained within a channel (with exceptions of certain forested, shrubby, emergent vegetated wetlands or habitats with water containing ocean-derived salts in excess of 0.5%).

  - **Lacustrine System,** including permanently flooded lakes and reservoirs, intermittent lakes, and tidal lakes with ocean-derived salinities below 0.5%. Also include limnetic and littoral subsystems.

  - **Palustrine System,** includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5%. This system groups vegetated wetlands

traditionally called marshes, swamps, bogs, fens, and prairie in the United States, as well as small, shallow, permanent or intermittent water bodies called ponds. No subsystems are identified for palustrine systems.

As part of the SFECCTA, more detailed wetland assessments will be conducted in Tier 2 to "ground truth" and verify the mapped data listed in **Table A.13**.

- **Endangered and Threatened Species:** The following species are listed by either the USFWS, the Florida Fish and Wildlife Conservation Commission (FWC), or the Florida Department of Agriculture & Consumer Services (FDA) as Endangered (E), Threatened (T), Threatened Due to Similar Appearance to another species T(S/A) or [Florida] Species of Special Concern (SSC), and could possibly inhabit or migrate through the subject project vicinity:

	Status USFWS/FWC
Birds	
Brown pelican (*Pelecanus occidentalis*)	[--/SSC]
Roseate spoonbill (*Ajaia ajaja*)	[--/SSC]
Little blue heron (*Egretta caerulea*)	[--/SSC]
Reddish egret (*Egretta rufescens*)	[--/SSC]
Snowy egret (*Egretta thula*)	[--/SSC]
Tricolored heron (*Egretta tricolor*)	[--/SSC]
Florida Scrub jay (*Aphelocoma coerulescens*)	[T/T]
Florida sandhill crane (*Grus canadensis pratensis*)	[--/T]
Peregrine falcon (*Falco peregrinus*)	[--/E]
Southeastern American kestrel (*Falco sparverius paulus*)	[--/T]
Bald eagle (*Haliaeetus leucocephalus*)	[T/T]
White ibis (*Eudocimus albus*)	[--/SSC]
Wood stork (*Mycteria americana*)	[E/E]
Burrowing owl (*Athene cunicularia floridana*)	[--/SSC]
Mammals	
West Indian manatee (*Trichechus manatus latirostris*)	[E/E]
Florida mastiff bat (*Eumops glaucinus floridanus*)	[--/E]
Reptiles	
American alligator (*Alligator mississippiensis*)	[T(S/A)/SSC]
American crocodile (*Crocodylus acutus*)	[E/E]
Atlantic loggerhead turtle (*Caretta caretta*)	[T/T*]
Atlantic green turtle (*Chelonia mydas*)	[E/E*]
Atlantic leatherback turtle (*Dermochelys coriacea*)	[E/E*]
Atlantic hawksbill turtle (*Eretmochelys imbricata*)	[E/E*]
Kemp's Ridley turtle (*Lepidochelys kempii*)	[E/E*]
Eastern indigo snake (*Drymarchon corais couperi*)	[T/T]
Rim Rock Crowned snake (*Tantilla oolitica*)	[--/T]
Florida Pine snake (*Pituophis melanoleucus mugitus*)	[--/SSC]
Gopher tortoise (*Gopherus polyphemus*)	[--/SSC*]

* = status applies to eggs as well as turtles or, in case of Gopher tortoise, Florida prohibits take, possession, sale, or purchase of tortoises or their parts except by permit.

Fish
Smalltooth sawfish (*Pristis pectinata*).....[E/--]

Amphibians
Gopher frog (*Rana capito* [formerly *R. areolata*]) ..... [--/SSC]

	Status USFWS/FDA
Plants	
Johnson's seagrass (*Halophila johnsonii*)	[T/--]
Golden leather fern (*Acrostichum aureum*)	[--/T]
Four-petal or Scrub pawpaw (*Asimina tetramera*)	[E/E]
Pine pinweed (*Lechea divaricata*)	[--/E]
Florida thatch palm (*Thrinax radiata*)	[--/E]
Brittle or Keys thatch palm (*Thrinax morrisii*)	[--/E]
Auricled or eared spleenwort (*Asplenium auritum*)	[--/E]
Toothed or Slender spleenwort (*Asplenium dentatum*)	[--/E]
American bird's nest fern (*Asplenium serratum*)	[--/E]
Delicate/modest spleenwort (*Asplenium verecundum*)	[--/E]

- **Critical Habitat:** The USFWS has designated portions of Miami-Dade, Broward, and Palm Beach Counties as critical habitat for the Everglades Snail Kite and West Indian Manatee. There are waterways and water bodies within the SFECCTA study area listed as Manatee Protection Zones (Idle Speed/No Wake Zones), including the Miami River, Arch Creek, Biscayne Bay, Hillsboro Canal, and numerous other stretches of ICWW or canals, as outlined in **Table 3.9** below. These manatee protection zones are illustrated in **Figures A.22 – A.25** in Appendix A. In addition, near shore waters of Biscayne Bay included in the southern portion of the SFECCTA study area have been observed to harbor Atlantic Bottlenose dolphin (Tursiops truncatus) that, although not listed by resource agencies above, are protected by the Marine Mammal Protection Act in U.S. Waters. An Endangered Species Biological Assessment (ESBA) will be conducted in Tier 2 for each segmental NEPA study that requires one in order to determine the possible presence of, and potential impacts to, the above listed species, other wildlife, and their habitat within the project vicinity.

Table 3.9: Manatee Protection Zones

Location	No. of Zones	Zone Types
Miami-Dade	16	Idle speed
Broward	22	50 foot slow speed buffer (Hillsborough Canal)
Palm Beach	152	25mph in channel, slow speed outside channel
Martin	3	Slow speed outside channel, 25mph max in channel
Total	**193**	**-**

Source: Florida Marine Research Institute (FMRI, 1998), now Fish and Wildlife Research Institute (FWRI)

In addition, 40 natural habitats classified as conservation areas by the Florida Natural Areas Inventory (FNAI) exist within the SFECCTA study area. These areas are listed in **Table A.14** (see Appendix A).

- **Essential Fish Habitat:** Essential Fish Habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The SFECCTA will have EFH for any involvement such as crossings of Biscayne Bay (such as at the POM), canals, rivers (i.e., Miami River, Little River, New River, etc.), creeks (Little Snake Creek, Arch Creek, etc.). For water crossings or hydraulic connections to water bodies in the SFECCTA study area, EFHs identified by the Gulf of Mexico Fishery Management Council may be present with the potential for involvement with managed species inhabiting or migrating through the project vicinity, as required by the MSFCMA. **Table 3.10** describes the types of EFH in the SFECCTA.

  No Habitat Areas of Particular Concern (HAPC) have been identified for involvement with the SFECCTA. The HAPCs are described as subsets of EFH which are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. The nearest Geographically Defined HAPCs identified in the Fishery Management Plan Amendment of the Gulf of Mexico Fishery Management Council is the Florida Keys National Marine Sanctuary.

Table 3.10: Essential Fish Habitat (EFH)

Estuarine Areas	Marine Areas
Estuarine emergent wetlands	Live bottoms
Mangrove wetlands	Coral reefs*
Submerged aquatic vegetation	Artificial/manmade reefs**
Algal flats*	Sargassum*
Mud, sand, shell, and rock substrates	Water column
Estuarine water column	Non-vegetated bottoms
	Vegetated bottoms

Source: Essential Fish Habitat: A Marine Fish Habitat Conservation Mandate for Federal Agencies, Gulf of Mexico Region, February 2002 (Appendix 4)
www.nmfs.noaa.gov/habitat/habitatprotection/profile/gomEFHguide.pdf
* Low likelihood habitats to occur in study area but will be determined in Tier 2 segmental studies
** Potential for Biscayne Bay or Lake Worth Lagoon artificial sites within extreme eastern edge of study area, but no SFECCTA alignments cross the bay.

3.9.2. Environmental Consequences

- **Wetlands:** The GIS alternatives analysis was reduced to a buffer width for review of 800 feet (400 feet from centerline of railway or roadway alignment) for wetland polygons nearby, adjacent to, or encroached upon by all alternatives. No Tier 1 alternatives included crossing waterways into the POM, PEV or PPB. The resulting numbers of polygons from the NWI dataset are presented in Appendix A, **Table A.13**, and were a criterion for the alternatives evaluation in Section 5.1.2, Comparative Benefits and Environmental Effects. The wetlands of primary concern are those associated with waterway crossings since that is where the likelihood of impacts may be greatest due to bridges on new location (adjacent to existing or entirely new), bridge replacements, or bridge widening. **Figures A.18 – A.21**, in Appendix A, show these and other waterway/wetland related features for all the project alternative segments. For those projects that are promoted as a result of Tier 1 to be studied in the Tier 2 independent NEPA studies, detailed analysis of wetland impacts, including avoidance, minimization and mitigation considerations, will be conducted. Typically for NEPA documentation of the EIS, EA or CE-II level, a Wetland Evaluation Report (WER) would be generated and circulated to the regulatory agencies for review and comment. It is anticipated that Tier 2 of this project would circulate WER or other appropriate assessment (e.g. a Wetlands Technical Memorandum for a CE-II project with no wetland involvement) with each individual project segment study.

  The FDEP, U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS, or NOAA Fisheries) responded to the AN description of potential wetland impacts along the SFECCTA alternative corridors through the ETDM process, identifying potential involvement with wetlands, need

to avoid, minimize, or mitigate wetland impacts, and that Essential Fish Habitat may also be involved. The FDOT Summary Response to the ETAT reviewers from these agencies agreed with and confirmed the degree of effect for wetlands as "moderate" effect. The FDOT response includes employing avoidance and minimization measures during future phases of the project study with final design of the project avoiding or minimizing wetland impacts to the greatest extent practicable and appropriate mitigation will be provided for unavoidable wetland impacts. Close coordination with ETAT agencies will continue throughout Tier 1 and Tier 2 of the project to further avoid impacts to these resources.

- **Endangered and Threatened Species:** Due to the likelihood that the proposed transit improvements expected to be studied in Tier 2 will be located within existing right-of-way (railway or roadway), it is anticipated that potential impacts to the above listed species may be greatest due to bridges on new location (adjacent to existing bridge crossings or entirely new), bridge replacements, or bridge widening. For those projects that are promoted as a result of Tier 1 to be studied in the Tier 2 independent NEPA studies, detailed analysis of potential impacts to listed species or their habitat, including avoidance, minimization and mitigation considerations, will be conducted. Typically for NEPA documentation of the EIS, EA or CE-II level, an ESBA would be generated and circulated to the regulatory agencies for review and comment. It is anticipated that Tier 2 of this project would circulate ESBA or other appropriate assessment (e.g. an Endangered Species Technical Memorandum for a CE-II project with no substantial or significant potential for involvement with listed species) with each individual project segment study.

  The USFWS, NMFS, and FWC responded to the AN description of potential wildlife and habitat effects along the SFECCTA alternative corridors through the ETDM process, identifying potential to affect valuable marine habitats such as seagrass beds and the project occurs within the occupied habitat of the endangered West Indian Manatee. In addition, the project is located within the Core Foraging Area of the protected Wood Stork. The project will provide compensatory mitigation for any wetland impacts in Core Foraging Areas. An ESBA will be prepared to address the potential impacts to endangered species including the West Indian Manatee and Wood Stork.

  The FDOT Summary Response to the ETAT reviewers from these agencies assigned an overall degree of effect for wildlife and habitat as "substantial" effect. The ETAT comments had "substantial" effect only for Palm Beach County alternative alignments due to significantly more undeveloped land and natural areas as compared to those in Miami-Dade or Broward Counties. The FDOT response includes employing avoidance and minimization measures during future phases of the project study with the final design of the project avoiding or minimizing impacts to habitats such as wetlands to the greatest extent practicable and appropriate mitigation will be provided for unavoidable impacts. Close

coordination with ETAT agencies will continue throughout Tier 1 and Tier 2 of the project to further avoid impacts to these resources.

- **Critical Habitat:** Since the proposed transit improvements that would be studied in Tier 2 would likely be located within existing right-of-way (railway or roadway), it is anticipated that there may be potential impacts to those FWS designated critical habitat portions of Miami-Dade, Broward, and Palm Beach Counties for the Everglades Snail Kite and West Indian Manatee. The most likely impact areas may be for bridges on new location (adjacent to existing bridge crossings or entirely new), bridge replacements, or bridge widening. These may include those waterways and water bodies within the SFECCTA study area that are also listed as Manatee Protection Zones (Idle Speed/No Wake Zones), including the Miami River, Arch Creek, Biscayne Bay, Hillsboro Canal, and numerous other stretches of ICWW or canals. For those projects that are promoted as a result of Tier 1 to be studied in the Tier 2 independent NEPA studies, detailed analysis of potential impacts to critical habitat will be included in the ESBAs, Endangered Species Technical Memoranda or possibly just summarized in the NEPA document as having no impacts (possible for small segmental studies entirely within urban areas with no waterway crossings).

- **Essential Fish Habitat:** There is potential for EFH involvement by SFECCTA alternatives that involve any waterway crossings of Biscayne Bay (such as at the POM), canals, rivers (i.e., Miami River, Little River, New River, etc.), creeks (Little Snake Creek, Arch Creek, etc.) or for wetland impacts anywhere in the study area (due to close proximity to the Atlantic Ocean). As with listed species and critical habitat above, it is anticipated that potential impacts to EFH may be greatest due to bridges on new location (adjacent to existing bridge crossings or entirely new), bridge replacements, or bridge widening. However, the proposed transit improvements that would be studied in Tier 2 may be located within existing right-of-way (railway or roadway) which would not eliminate concerns but may reduce the potential impacts. Furthermore, the existing railway bridges may be utilized or new spans of the waterways with solid decks to catch freight spillage and contain stormwater runoff in nearby drainage treatment structures or facilities (e.g., dry retention ponds) may be designed as a result of independent Tier 2 segmental transit studies. Coordination with the NMFS will continue on EFH throughout both Tiers of this study.

In response to the AN through the ETDM process, the NMFS indicated that the potential existed for the SFECCTA alternatives to have a “moderate” effect on valuable marine habitats such as seagrass beds and habitat of the endangered West Indian Manatee.

The NMFS ETAT review noted that proposed alternatives cross several river and canal systems that drain into EFH and into habitat used by species listed under the Endangered Species Act (ESA).

Construction activities, stormwater runoff, and cumulative impacts associated with the proposed project may directly and indirectly impact these habitats by degrading water quality. Critical habitat for Johnson's seagrass and mangroves are of particular concern because these habitats support both federally-listed endangered smalltooth sawfish and federally managed species. The NMFS reviewer also requested that complete detailed project description of the construction activities and seagrass surveys should be provided so adequate measures and analysis can be advised to prevent adverse impacts to Johnson's seagrass.

The FDOT Summary Response to the ETAT reviewer from this agency agreed with and confirmed the degree of effect for coastal and marine (of which EFH is an integral component) as "moderate" effect since parts of the proposed rail system would cross streams, canals, and riverine habitat that drain to estuarine areas. The estuarine areas in Broward County for example have the potential to be impacted include mangrove, emergent marsh, and seagrass. In addition to the EFH and the federally managed and ESA-listed species identified, emergent wetlands and palustrine wetlands are trust resources that have the potential to be impacted. The final design for the project will avoid or minimize wetland impacts to the greatest extent practicable and appropriate mitigation will be provided for unavoidable wetland impacts. If impacts to wetlands are anticipated in final design of any proposed premium transit segmental projects after Tier 2 NEPA studies, a mitigation plan will be prepared for NMFS and other resource agency review, prior to project approval. In addition, in the event that federally listed species are present in the project area, and the project and related construction may impact these species and EFH; a biological assessment/evaluation (BA/BE) for the federally-listed species, and an EFH assessment will be conducted.

3.10. Natural Resources

3.10.1. Affected Environment

- **Aquatic Preserves and Outstanding Florida Waters:** The Biscayne Bay Aquatic Preserve is located in the southern portion of the project study area adjacent to the eastern shore of Miami-Dade County's mainland. There are two potential crossings of this aquatic preserve (AP) that will be considered in the SFECCTA, one at the POM and another crossing of the Oleta River. The Loxahatchee River - Lake Worth Creek Aquatic Preserve is located within the northern limits of the study area in Palm Beach County and is crossed in that portion of the study area extending north from Jupiter towards a potential rail yard siting in northern Palm Beach County or extreme southern Martin County (see **Figures A.22 – A.25** in Appendix A).

  All waters of Biscayne Bay are classified as Outstanding Florida Waters (OFW). In addition, other OFW are involved at the Loxahatchee River. However, this project poses limited potential for OFW

involvement because the corridor crosses Biscayne Bay OFW only at the POM and the Oleta River, and the corridor will only cross the Loxahatchee River if a rail yard is sited in Palm Beach County north of SR 706/Indiantown Road or in southern Martin County. The majority of the 85 miles of SFECCTA corridor are entirely outside of OFW (see **Figures A.22 – A.25** in Appendix A).

- **Water Quality:** Miami-Dade and Broward Counties, and the southern portion of Palm Beach, are all underlain by the Biscayne Aquifer, the sole source of potable water for most of Southeast Florida. Potable water for Miami-Dade County is supplied principally from the Northwest and West Wellfields, with other smaller well fields closer to the SFECCTA study area in northeast Miami-Dade as well as Broward and southeast Palm Beach Counties.

- **Wild and Scenic Rivers:** The Loxahatchee River - Lake Worth Creek AP is located within the northern limits of the study area and is crossed in that portion of the study area extending north from Jupiter towards a potential rail yard in northern Palm Beach County or extreme southern Martin County (see **Figure A.25** in Appendix A). However, the Wild and Scenic designated portion of the Loxahatchee River is not within the project limits but lies further west of the SFECCTA study area.

- **Floodplains and Regulatory Floodways:** According to the Federal Emergency Management Agency (FEMA) GIS Floodplains layer (FEMA96), a digital representation of certain features of Flood Insurance Rate Maps (FIRMs) published by FEMA, the study area falls both within and outside of special flood hazard areas (base, 100 year, floodplain). The SFECCTA areas lying within the special flood hazard areas correspond to drainage basins of rivers, creeks, and canals (see **Figures A.26 – A.29** in Appendix A). There are significantly greater areas of the SFECCTA that traverse base floodplains in Broward and Palm Beach Counties than in the Miami-Dade portions of the study area. There is no involvement with regulatory floodways in Miami-Dade, Broward or Palm Beach Counties. However, numerous waterway crossings do occur, including rivers, creeks, and 16 SFWMD canals, as shown in **Table A.15** in Appendix A.

- **Coastal Zone Consistency:** A Coastal Consistency Review is required (per 15 CFR 930) since the project is anticipated to use federal funds. The majority of the 85 miles of SFECCTA corridor are entirely outside of coastal waters and adjacent shore lands. The FDEP, Office of Intergovernmental Programs, determined that the project is consistent with the Federal Coastal Management Program (FCMP) based upon their review of the project AN.

- **Coastal Barrier Island Resources:** Several Coastal Barrier Resources are located within the SFECCTA study area, including three identified in **Table 3.11** below. The entire SFECCTA study area

and potential planned alternative improvement routes are located entirely on the mainland and not likely to involve these resources (see **Figures A.22 – A.25** in Appendix A).

Table 3.11: Coastal Barrier Resource Units

County	Unit (s)	Unit Name
Palm Beach County	15P	Blowing Rocks (also in Martin County)
Broward County	20P	John U. Lloyd Beach
Miami-Dade County	34P	Biscayne Bay

Source: NOAA (1998)

- **Farmlands:** A minute portion (<1%) of the entire corridor can be categorized as agricultural land (see **Table 3.2** in Section 3.2 above). A large expanse of the corridor is primarily mixed use (urban/commercial/ residential) and most if not all of the agricultural land within the corridor consists of commercial plant. Through coordination with the Natural Resources Conservation Service, it has been determined that the project study area which is located primarily in the urbanized area of Miami-Dade, Broward, and Palm Beach Counties does not meet the definition of farmland as defined in 7 CFR 658. Therefore, the provisions of the Farmland Protection Policy Act of 1984 do not apply to this project.

3.10.2. Environmental Consequences

- **Aquatic Preserves and Outstanding Florida Waters:** Although the Biscayne Bay AP is adjacent to the southern project study area, the most likely effect would be from potential crossings of canals and waterways that discharge to this and other AP's along the corridor. There are two crossings of the Biscayne Bay AP that will be considered in the SFECCTA, one at the POM and another crossing of the Oleta River. The Loxahatchee River - Lake Worth Creek AP is outside the limits of the proposed northernmost alignments. However, it is hydrologically connected to the study area. Potential impacts to the Loxahatchee as a result of transit improvements will be assessed in Tier 2.

  In response (through the ETDM process) to the AN description of potential impacts to AP along the SFECCTA alternate corridors, a FHWA ETAT reviewer for "Special Designations" (of which AP is an integral component) considered the potential impacts as "substantial". The FDOT Summary Response agreed with the ETAT reviewer from FHWA. Furthermore, the summary response states that FDOT will follow the procedures as outlined in Part 2, Chapter 19 of the PD&E Manual regarding projects located in aquatic preserve: 1) Special notation on the Class of Action Request; a determination of involvement with a designated Aquatic Preserve; coordination with FDEP; proper documentation; Section 4(f) applicability; an assessment of impacts and the proper statement stating the project will not have an impact on the Biscayne Bay AP or the Loxahatchee River - Lake Worth Creek AP. In

addition, FDOT will implement best management practices for erosion, turbidity, and other pollution control to prevent violation of state water quality standards.

The majority of the study area is entirely outside of OFW. The impact of the alternatives being considered will therefore be minimal. However, if an alternative is selected that requires crossing the Loxahatchee River, an analysis of the alternative's impact on this OFW will be detailed in Tier 2.

The FHWA ETAT reviewer for "Special Designations" (including OFW) responded to the AN description of potential OFW effects along the SFECCTA alternative corridors through the ETDM process, identifying potential to affect OFW. The FDOT Summary Response to the ETAT reviewer from this agency agreed with and confirmed the degree of effect for Special Designations (of which OFW is an integral component) as "substantial" effect. Furthermore, the summary response states that FDOT will implement best management practices for erosion, turbidity, and other pollution control to prevent violation of state water quality standards.

- **Water Quality:** The proposed stormwater facility designs will include, at a minimum, the water quantity requirements for the water quality impacts as required by local codes such as Chapter 24, Section 24-58 of the Miami-Dade County code and State codes such as 40E-4, FAC. The Miami-Dade County requirements meet or exceed the State of Florida water quality and water quantity requirements (applicable for portions of the SFECCTA in Miami-Dade County). For areas of the SFECCTA outside of Miami-Dade County, the SFWMD will be coordinated with in accordance with the FAC and the ERP Basis of Review Manual as well as the Broward County Department of Environmental Protection (BDEP), Palm Beach Department of Environmental Resources Management (PBERM), and Martin County Office of Water Quality (OWC). Other local entities such as water control districts may also require coordination. Therefore, it is anticipated that water quality within the project area will improve due to the proposed stormwater treatment measures.

  As a result of the ETDM GIS analysis, FHWA and FDEP comments by these agency ETAT reviewers indicate Jonathan Dickinson State Park and the Loxahatchee River within one mile of the proposed rail project. The Loxahatchee River is designated as the Loxahatchee National Wild and Scenic River. Aquatic preserves, state parks, and Wild and Scenic Rivers are listed as OFWs under section 62-302.700(9), Florida Administrative Code (F.A.C.) and therefore, the FDOT confirmed "substantial" summary degree of effect assigned to water quality and quantity. FDOT will demonstrate that the proposed stormwater system meets the design and performance criteria established for the treatment and attenuation of discharges to OFWs under Rule 40E-4, F.A.C., and the SFWMD Basis of Review for Environmental Resource Permit (ERP) applications. In addition, FDOT will implement best management practices for erosion, turbidity, and other pollution control to prevent violation of state

water quality standards. Through design standards and construction standards, FDOT manages both construction impacts and operational (stormwater drainage management) effects on water quality.

- **Wild and Scenic Rivers:** None of the alternatives will impact wild and scenic rivers (WSR) since the designated portion of the Loxahatchee River is west of the study area. The FHWA ETAT reviewer for "Special Designations" (including WSR) responded to the AN description of potential WSR effects along the SFECCTA alternative corridors through the ETDM process, identifying potential to affect WSR. The FDOT Summary Response to the ETAT reviewer from this agency agreed with and confirmed the degree of effect for Special Designations (of which WSR is an integral component) as "substantial" effect. Furthermore, the summary response states that FDOT will implement best management practices for erosion, turbidity, and other pollution control to prevent violation of state water quality standards.

- **Floodplains and Regulatory Floodways:** All the alternatives will need to be analyzed for their individual impact to existing floodplains and regulatory floodways during the Tier 2 analysis. Due to the presence of existing canals, rivers, creeks and drainage basins throughout the study area, it is probable that all alternatives will cross or impact these resources. However, most of the alternatives are along existing alignments such as I-95 and US-1 where urban development currently exists. Therefore, these alternatives have the potential to impact existing floodplains and floodways less than those alternatives along the FEC Railway corridor.

- **Coastal Zone Consistency:** Since the study area is outside of the coastal waters and adjacent shore lands, none of the proposed alternatives will impact coastal areas.

- **Coastal Barrier Island Resources:** None of the improvement alternatives will negatively impact coastal barrier island resources.

- **Farmlands:** The study area has little or no farmlands as officially designated under the Farmland Protection Policy Act, only minimal land use designations for agriculture, consisting primarily of commercial plant nurseries. Therefore, the alternatives will not negatively impact designated farmland resources.

3.11. Contamination and Hazardous Materials

3.11.1. Affected Environment

A preliminary GIS-based survey for listed hazardous material generators and/or potentially contaminated properties was conducted for the project. Based on a review of National Priority List (NPL)/Superfund

Site, Solid Waste/Dump Site, Brownfield, EPA Toxic Release Inventory Site, and Petroleum UST GIS data layers publicly available from the FGDL, approximately 3,348 potential contamination sites (including 9 Superfund, 3,035 underground storage tanks (UST), 10 Brownfield sites/areas, 80 solid waste sites, 160 hazardous materials sites, 54 toxic release inventory sites) are potentially present throughout the entire SFECCTA study area.

These results indicate the potential for contamination concerns within the study area and are presented, in a general fashion in Appendix A in **Figures A.30 – A.33** and tabulated in **Tables A.16 – A.17**. However, Superfund Sites are presented in **Table 3.12**, below. Note that for the preliminary analysis for Contamination and Hazardous Materials, the study area was based on a buffer distance of 1.25 miles on either side of the FEC Railway centerline for NPL/Superfund and Solid Waste/Dump (other GIS analyses in the SFECCTA corridor for Affected Environment conducted with a buffer distance of 1.0 mile from the FEC Railway unless otherwise noted).

Table 3.12: Superfund Sites (1.25 mi Buffer)

Name	Address	County	NPL Status
Varsol Spill	Miami INTL Airport	Miami-Dade	Deleted
Airco Plating Co.	3636 NW 46th Street	Miami-Dade	Final
Anaconda Aluminum CO./Milgo Electronics Corp.	3630 NW 76th Street	Miami-Dade	Deleted
Munisport Landfill	NE 152nd St. & Biscayne Blvd.	Miami-Dade	Deleted
Chemform. Inc.	1410 SW 8th St.	Broward	Deleted
Hollingsworth Solderless Terminal	700 NW 57th Pl.	Broward	Final
Wilson Concepts of Florida, Inc.	1408 SW 8th St.	Broward	Deleted
BMI-Textron	1121 Silver Beach Rd.	Palm Beach	Final
Trans Circuits, Inc.	210 Newman Rd.	Palm Beach	Final

Source: Florida Geographic Data Library 2002

3.11.2. Environmental Consequences

For the GIS alternatives analysis the buffer width of the study area was reduced to 800 feet (400 feet from on either side of the centerline of railway or roadway alignment) for potential hazardous materials/contamination sites. The buffer distance for Superfund sites was greater however, extending out to 1 mi from either side of each alternative alignment being evaluated. The resulting numbers of points and polygons from representative contamination datasets are presented in Appendix A, **Tables A.16 – A.17** and in **Table 3.12** - Superfund Sites, above. These data results were utilized as a criterion for the alternatives evaluation in Section 5.1.2, Comparative Benefits and Environmental Effects (see **Table 5.3** in Chapter 5.0). Furthermore, an independent report from Environmental Data Resources, Inc.

(EDR) was obtained for the original buffer width for review of 2.0 miles (2.5 miles for Superfund and Solid Waste/Landfill Sites), defined by 1.0 and 1.25 miles on either side of the FEC Railway, respectively. The EDR report is on file at the FDOT Office of Planning and Environmental Management (PL&EM) and is also available upon request. It is anticipated that the more current data and standardized formatting of the EDR report will be helpful for potential advance right-of-way acquisition of railway right-of-way and/or nearby or adjacent parcels of land in a potential program of transit corridor/station site preservation by FDOT.

As a result of the ETDM GIS analysis, and comments from the FHWA and the FDEP ETAT reviewers potential contamination and hazardous materials sites have been identified throughout the entire SFECCTA project study area. The FDOT Summary Response to the ETAT reviewers was that the potential effect of contaminated sites was determined to be “moderate“. Based on this information, potentially contaminated sites may exist within the FEC Railway corridor itself. Furthermore, the FDOT responded that per FDOT procedures, a Level One contamination screening as part of Tier 2 NEPA studies. The Tier 2 studies are anticipated to include Contamination Screening Evaluation Reports or Technical Memorandum to identify any potential contamination that may exist and rank the sites based on a rating of No, Low, Medium or High. Sites identified as High or Medium will be avoided to the greatest extent possible. In the event contamination is detected during construction, the FDEP, Miami-Dade County DERM, Palm Beach County Department of Environmental Resources Management, Palm Beach County Health Department and Broward County Planning and Environmental Protection Department will be notified.

3.12. Other Impact Areas Identified in Scoping (Navigation, RR Crossing Safety, etc.)

3.12.1. Affected Environment

A scoping process was initiated in Tier 1 of the SFECCTA, and will continue in Tier 2 (see Section 2.1 Screening and Scoping of Alternatives and Section 7.1 Scoping Comments and Results). Of numerous topics discussed and questions posed by members of the general public, elected officials or representatives, and agency staff, some are discussed in other sections of this document (e.g., noise and vibration). Other key issues that are not covered in other sections are outlined below:

- **Navigation:** A total of seven navigable waterways crossed by the FEC Railway have been identified within the SFECCTA study area and alternatives include the potential to cross the ICWW at the POM, as well as potential for crossing navigable portions of the Miami River/Canal, Little River, Oleta River, the New River, the Lake Worth Lagoon and, potentially, the Loxahatchee River. However, many of these waterways’ navigable extents are downstream of the likely crossing locations for SFECCTA

alternatives. The Loxahatchee River crossing was brought up as a particular concern during Palm Beach County Scoping due to the heavy navigation use by the community. Other waterway crossings include numerous non-navigable canals as shown in **Table A.15** in Appendix A.

- **Railroad Crossing Safety:** The FEC Railway has at least 202 at-grade railroad (RR) crossings within the project study area (more crossings if connections to other rail lines, airports and seaports are selected), and associated issues of noise from train horns, safety, consolidation (i.e., closing) roadway crossings, and possible elevation of train crossings over roadways were discussed by the public at the scoping meetings. In addition, internal workshops of roadway, railway (freight and transit), and environmental staff identified that there needs to be a program of RR crossings consolidation so that local communities can be involved in the process while the study proceeds into Tier 2 where these decisions can be effectively pursued.

3.12.2. Environmental Consequences

- **Navigation:** There is little likelihood of directly utilizing navigable waterways for transit purposes (i.e., via water bus, high speed or conventional ferry boats, other alternative water-borne transit modes). The exact number and type of waterway crossings to be utilized by the locally preferred alternatives selected in Tier 2 will be determined and evaluated individually in Tier 2 segmental NEPA studies. There is potential for new bridge crossings and widening and/or reconstruction of existing bridges over navigable (and non-navigable) waterways that will be further analyzed in Tier 2. Existing bridge (rail and roadway) facilities may be feasible to utilize, but the exact locations, suitability, and adequacy of structural integrity must be assessed as part of individual segmental engineering studies during Tier 2. There was no ETAT comment for navigation in the EST in response to the AN. However, the FDOT Summary Response to the ETAT for navigation assigned a “minimal” degree of effect, noting that although there are navigable water crossings in the project area, the project will avoid or minimize impacts to navigation to the maximum extent practicable.

  For example, one preliminary assessment is that should the FEC Railway crossing of the New River in Downtown Ft. Lauderdale be utilized, a high level fixed bridge to replace the existing low-level bascule bridge over the river will be studied to reduce the number of new openings and improve navigation on that waterway. Similar evaluations may be necessary such as for crossing the Loxahatchee River with a high level fixed bridge and/or new low level bridges for other locations as a program of navigable crossing studies are implemented in Tier 2 during individual NEPA segmental studies. It should be noted that crossing the Loxahatchee River was primarily studied to determine the potential for locating a rail yard north of it. Initial findings indicate that crossing this river may not be necessary for the alternatives being considered. No alternative crossing the existing FEC Railway bridge over the ICWW to the POM have been included in Tier 1. These Tier 2 studies will necessarily include determinations

under 23 CFR 650, Subpart H, Section 650.805, regarding whether or not U.S. Coast Guard (USCG) permits are required.

Figures A.22 – A.25 in Appendix A shows Natural Resources including navigable waterways (defined as navigable for interstate commerce) for the initial alternatives evaluated for the SFECCTA. There are likely to be fewer FEC Railway crossings of navigable waterways than for transit alternatives considered along the parallel US-1 crossings of the same waterways. This is due to the fact that the low level bridges carrying US-1 (such as for Biscayne Boulevard in Miami-Dade County and Dixie/Federal Highway in Broward County) are the points at which navigable access up river or upstream is blocked on those waterways. Low level bridges carrying roadway traffic are not likely to require replacement with high level bridges solely to accommodate transit services along these roadway arterials. However, new transit service along the FEC Railway over navigable waterways would likely require new high-level fixed bridges (typically with bridge "underdeck" elevations of at least 65 feet above Mean High Water level of the navigable waterway) for new transit service tracks crossing those navigable waters.

In some instances such as the New River or Loxahatchee River, no impacts to navigation would occur from premium transit services utilizing high level fixed span bridges at these FEC Railway crossing locations. These existing FEC Railway crossings currently experience relatively infrequent (compared to transit service schedules) impacts on navigation by freight train crossings of low-level bascule bridges that must be lowered for each train. These existing rail bascule bridges are generally kept in upright positions until freight trains approach, presenting no obstruction to navigation except during freight runs or maintenance operations. While new high-level fixed span bridges are not anticipated to be built for FEC Railway freight tracks necessarily, these existing and proposed bridge studies will be integral parts of Tier 2 analyses and must be considered for each independent NEPA assessment of the segmental transit studies in the SFECCTA corridor that will include navigable waterway crossing(s).

- **Railroad Crossing Safety:** The FEC Railway would benefit from fewer numbers of crossings that may result from a RR crossing consolidation program in Tier 2 from a freight movement perspective. However, public safety would also improve. The effect would likely be beneficial from a noise perspective as well. Adverse effects would primarily and foremost be to the local communities by interfering with local traffic patterns, creating perceived or actual delays in access to emergency facilities/first responders, schools, religious facilities and other community facilities. Environmental Justice considerations of direct, secondary (that is, indirect), and cumulative impacts that may result from further splitting of neighborhoods and communities in the vicinity of the proposed transit corridor(s) will be important in potential consolidation of RR crossings as a result of providing new

premium transit services and will also be part of a program of socio-cultural effects evaluations in Tier 2.

3.13. Affected Environment and Environmental Consequences Conclusion

This chapter provided the data and framework for consideration of environmental resources and impacts to natural resources and the human environment that must also be included in alternatives analysis (along with technologies, market segments served, ridership, costs and other elements in this study) in order to comply with the requirements of NEPA, FTA, and FHWA. Utilizing GIS data and GIS analysis, the tremendous quantity of catalogued social-economic, natural, biological, and physical resources within the SFECCTA study area have been documented and queried for each proposed alternative.

The next section, Chapter 4.0 – Transportation Systems, describes the potential impacts to existing highway, transit, and freight operations in the SFECCTA study area from the different proposed alternatives. These impacts, together with the environmental analyses, cost and ridership information, will be used to further evaluate alternatives.

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4.1. Highway

4.1.1. Traffic Conditions and Impacts (Regional and Neighborhood)

As indicated in the Purpose and Need, the regional transportation system in the area includes two continuous major north-south roadways, US-1 and I-95. Dixie Highway is another major north-south roadway but is not continuous throughout the tri-county area. There are also major east-west State Routes and Interstates that intersect with the SFECCTA corridor such as I-395/SR 836, I-195/SR 112, SR 826/NE 163rd Street, and I-595. An overall assessment of the traffic conditions in the study area found that seventy percent (70%) of the roadways are operating at deficient levels of service in 2004 (LOS D, E or F) and thirty one percent (31%) are at a level of service F. The regional roadway corridors (US-1 and I-95) that are parallel to the FEC are and will continue to be heavily congested in 2030 for all three counties. Roadway congestion contributes to unreliable travel times and delays due to incidents and crashes and other factors that disproportionately impact personal and business travel. In Broward County alone, the number of vehicle-hours traveled (VHT) will more than double from 822,000 in 2000 to 1,930,000 in 2030. Furthermore, the number of vehicle hours of delay increases from 10,000 hours to 858,000 during the same time span. I-95 is the most highly utilized north-south corridor, carrying over 300,000 vehicles daily. Uncongested travel time in 2030 along I-95 from Palm Beach County to Miami-Dade County is 3 hours and 6 minutes, whereas congested travel times in 2030 for the same segment increases to 4 hours and 12 minutes. Previous studies of I-95 confirm that the significant delays along the corridor, especially in Miami-Dade and Broward, were during the a.m. and p.m. peaks.

Different alignments and technologies being considered for the study area will have different impacts to traffic. For example:

- A regional bus along the I-95 alignment would have minimal impact to traffic since it is a limited access facility. However, a regional rail alternative along I-95 would require a new rail facility that would impact the bridges on I-95. Reconstruction of I-95 bridges would be a significant local traffic impact.
- Any proposed transit along the US-1 corridor would negatively impact traffic if the transit vehicle would operate in mixed traffic. If a dedicated lane is provided, then additional right-of-way impacts must be accommodated.
- Although the FEC corridor is a separate facility from existing roadways, the impact of any transit along that corridor would be to the cross streets. The following grade crossings have been identified for each service segment.
    - In Service Segment 1 there are between 15 and 17 grade crossings

- In Service Segment 2 there are 87 grade crossings
- In Service Segment 3 there are 101 grade crossings
- In Service Segment 4 there are 57 crossings
- In Service Segment 5 there are102 crossings
- In Service Segment 6 there are 46 crossings

Increasing train traffic through these grade crossings would have an impact on vehicular and pedestrian traffic on cross streets. Some of these impacts may need to be addressed with grade separation or other mitigating measures.

The SERPM model was used to analyze the alternatives and initial results indicate that all the alternatives would reduce overall vehicle miles traveled in the study area from the No-Build alternative. However, VMT is significantly reduced along the FEC alignments with a 2% reduction, versus the street transit alternative alignments and the regional bus alternative along I-95, where VMT was reduced by 1% respectively. All the alternatives had a positive impact on delay.

4.1.2. Parking Demand and Supply

Parking measures should be complimentary to transit services to encourage transit ridership. Parking rates at the destination (located within the study area) will greatly impact the decision to make a trip by regional transit for trips originating outside of the study area. Station areas have been identified to serve transit along the study area and these areas will need to be sized based on the drive and walk access to each. A low parking supply with high fees will make transit a more desirable option compared to automobile travel. Preferential parking for ridesharing can make carpooling a more attractive commuter travel option as well. A preliminary review of municipal parking policies indicates that they still plan to accommodate large amounts of parking. Therefore, policy changes limiting the amount of parking with new residential development in the study area, through zoning or code changes can increase local transit usage.

An analysis of the existing type of parking along the SFECCTA corridor indicated that off-street parking is the most frequent parking type along the SFECCTA corridor mainline. Parking rate information was only available from the Miami Off-Street Parking Authority and ranged from $20 a month to $135 a month. Key to making transit a viable option along the FEC corridor is to provide park and ride locations at end of the line stations or key transfer stations with Tri-Rail. Within CBD locations along the corridor, parking supply should be minimized to encourage walking to stations and parking rates should be consistent with Federal Transit Administration guidelines. Eliminating or reducing the supply of convenient

(free/unregulated or under regulated) on-street parking in the vicinity of the station areas will also discourage short distance auto trips.

Although the SERPM model is not sensitive to parking supply in a quantitative way, it does represent parking supply on the highway side as an added cost to auto travel in the form of parking costs. On the transit side, parking supply is used in relation to station areas where the mode choice model recognizes that auto access to that particular transit stop is possible and if there is a cost associated with it, it adds impedance to whatever transit path utilizes the auto access to that station. Travel demand models recognize two kinds of parking: one is the parking lots at transit stations, which are seen by the model as opportunities for access to transit and the other is parking lots not associated with transit, which are seen by the model as costs associated with auto travel. Therefore, existing and future parking supply and rates within the study area can impact transit ridership of a proposed transit service along the FEC corridor area.

Refinement of the required parking supply needed at each potential station area will be a Tier 2 process. Requirements for additional land necessary to accommodate parking at appropriate stations will also be further studied in Tier 2. Right-of-way issues with respect to potential alternatives is discussed further in Chapter 6.

4.2. Transit

4.2.1. Service and Operations

As indicated in the Purpose and Need, existing transit in the study area is comprised of the following services and agencies.

- Miami-Dade Transit
- Broward County Transit
- Palm Tran
- South Florida Regional Transportation Authority (Tri-Rail)
- National Railroad Passenger Corporation (Amtrak)
- Intercity Bus Services (i.e. Greyhound)
- Jitneys (privately operated public transit, vehicles intermediate between taxis and buses)
- Shuttle Bus Services

- Para-transit Services

- Waterborne Transit

In Miami-Dade County, the Metrorail and Metromover systems, and 37 bus routes, are in the SFECCTA study area. Broward and Palm Beach Counties also provide bus transit service within the study area. The bus routes within the study area for each respective county are considered the highest ridership routes. For example, in Palm Beach County, study area bus routes constitute over 70% of the Palm Tran system ridership. More detailed information regarding the existing transit system is included in the Purpose and Need and in the Existing Conditions Technical Memorandum. One significant transit component in the SFECCTA study area is Tri-Rail which operates along the CSXT line. Any proposed transit project within the study area must be compatible with and build upon the existing Tri-Rail system. As discussed in Chapter 2, all the alternatives being considered assume connections with Tri-Rail. Therefore, it is important to understand Tri-Rail travel characteristics and patterns so that alternatives developed for the SFECCTA can complement Tri-Rail characteristics.

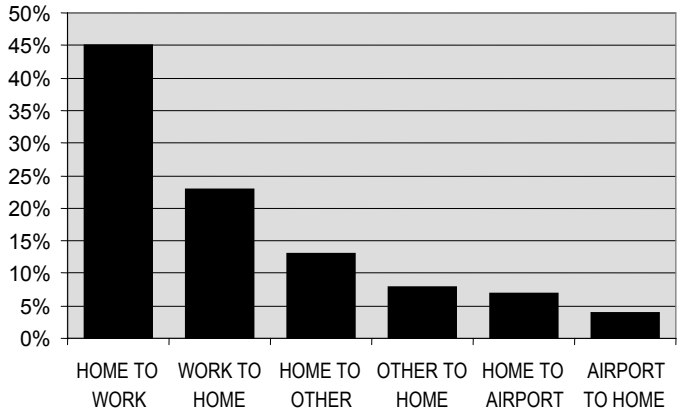
On a typical weekday Tri-Rail operates forty commuter passenger trains. All of these trains run between Mangonia Park at the northern end of the Tri-Rail district and MIA at the southern end of the Tri-Rail district. The most recent survey of Tri-Rail passengers was completed in mid-December 2004. A total of 920 usable responses were received from a one-day sample of all passengers boarding and disembarking trains between 6am and 3:00pm. The results of this survey indicate that Tri-Rail passengers make trips for a variety of purposes.

Table 4.1: Tri-Rail Morning Passengers by Trip Type

Passenger Trip Type	Percentage of Total
Home to work	45
Work to home	23
Home to other	13
Other to home	8
Home to airport	7
Airport to home	4
Total	100

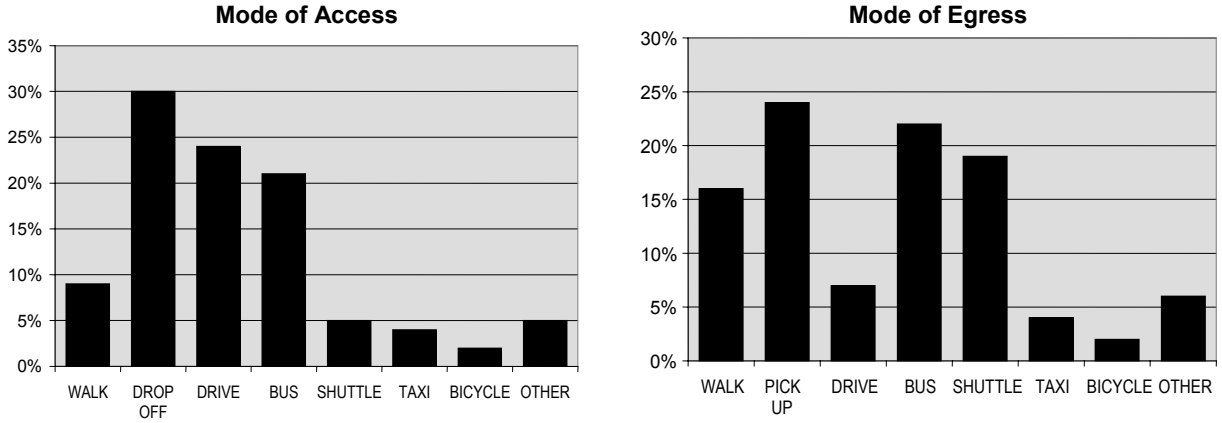
Source: EK Analysis based on South Florida Regional Transportation Authority Transit Development Plan FY 2006-2010, August 2005.

Figure 4.1: Tri-Rail Trips by Trip Purpose



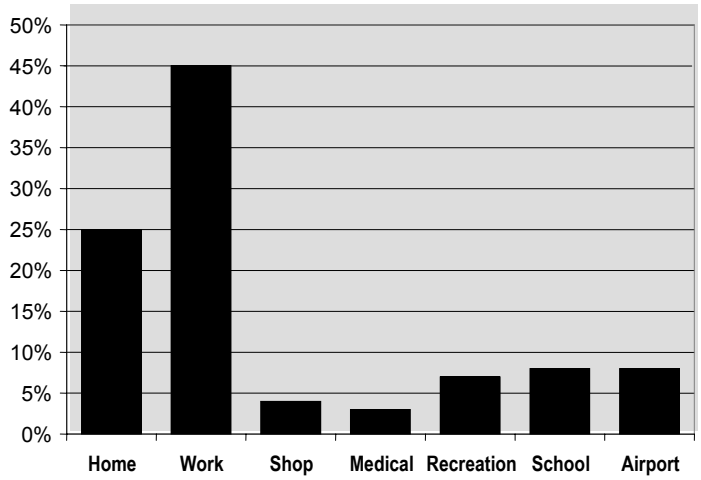
- **Arrival and Departure Modes:** For a "commuter railroad", the Tri-Rail arrival mode shows relatively low levels of park-and-ride ridership for customers traveling between 6:00 AM and 3:00 PM. The most common way of reaching a Tri-Rail station is to be dropped off from a private auto. The most common way of leaving a Tri-Rail station is to be picked up in a private auto. The departure mode shows a high level of pick-up arrangements, as shown in **Figure 4.2**.

Figure 4.2: Tri-Rail Station Access and Egress Mode



- **Riding Destinations:** The destinations of Tri-Rail passengers in the morning rush hour are shown in **Figure 4.3**. The majority of trips are work bound. Up to 25% of the trips are home-bound, which might represent night-shift workers at the airports and elsewhere going home after work or day-trippers returning home before 3:00 PM. About 7% of trips represent students commuting to school in Palm Beach County. Other destinations account for the remaining 23%

Figure 4.3: Tri-Rail Morning and Midday Passengers Trip Destinations



- **Time of Operation:** Tri-Rail operates commuter passenger trains in the study area throughout the day but the greatest density of service is from 6:00 AM to 9:00 AM and from 4:30 PM to 7:30 PM, when the service headway as short as 20 minutes. The reduced density of passenger train operations in the mid-day and evening periods appears to provide employees of CSXT with an opportunity to perform routine maintenance and service local freight customers with reduced interference by commuter passenger trains.

Table 4.2: Tri-Rail Connecting Transit Services

Station	Connecting Bus Service	Cost	Station	Connecting Bus Service	Cost
Mangonia Park	Palm Tran	$1.25	Fort Lauderdale Airport	BCT	$1.00
West Palm Beach	Palm Tran	$1.25		SFRTA	Free
Lake Worth	Palm Tran	$1.25	Sheridan St.	BCT	$1.00
Boynton Beach	Palm Tran	$1.25		SFRTA	Free
Delray Beach	Palm Tran	$1.25	Hollywood St.	BCT	$1.00
Boca Ration	Palm Tran	$1.25	Golden Glades	BCT	$1.00
	SFRTA	Free		MDT	$1.25
Deerfield Beach	BCT	$1.00	Opa-Locka	MDT	$1.25
	SFRTA	Free	Metrorail Transfer	Rapid Transit	$1.25
Pompano Beach	BCT	$1.00	Hialeah Market	MDT	$1.25
Cypress Creek	BCT	$1.00		SFRTA	Free
Fort Lauderdale	BCT	$1.00	Miami International Airport	MDT	$1.25
	SFRTA	Free		SFRTA	Free

Source: SFRTA Transit Development Plan (2006-2010).
Notes: BCT - Broward County Transit; MDT - Miami-Dade Transit; SFRTA - South Florida Regional Transportation Authority.

Free shuttle buses connect most Tri-Rail stations with nearby downtown areas and other important locations, including the Miami, Fort Lauderdale and Palm Beach International Airports (MIA, FLL, and PBIA). Passengers can also transfer between Tri-Rail and Metrorail at the Tri-Rail/Metrorail Transfer station.

- **Tri-Rail Operating Schedule:** The first Tri-Rail schedule to take advantage of the recently completed double-track between the Gator Interlocking and Hialeah Yard went into service effective March 27, 2006. Compared with previous service, this schedule offered more frequent trains and shorter trip times. Up until late March 2006, Tri-Rail offered a more limited schedule of 30 weekday trains with longer 119 minutes (1:59) running time and relatively poor on-time performance. Today, Tri-Rail operates 40 weekday trains with a 110-minute (1-hour 50-minute) running time. Tri-Rail runs on hourly headways throughout the day, except for the peak period when trains run every 20 minutes.

  Service operates on a 120-minute headway throughout the day on Saturdays, Sundays, and Holidays. One pair of late-night train operates Saturdays only which departs from Mangonia Park and MIA at 8:47pm and 9:28pm respectively.

  Since its inception in 1989, Tri-Rail ridership has ranged between 6,000 and 10,000 boardings each weekday. During its first year, the system carried about 3,000 passengers each weekday. By 1991, ridership had grown to approximately 7,600 passengers each weekday. The average weekday system ridership reached 10,000 passengers in 1994. In the final season of I-95 reconstruction, when Tri-Rail operated between MIA and West Palm Beach, the weekday ridership averaged 9,700 boardings.

  However, by the summer of 1995, that number has fallen to 6,700 daily riders. This decrease was attributed to a fare increase and train delays caused by work to construct the first segment of double-track. Since that low point, the system has shown steady progress toward returning to 10,000 daily boardings. It is expected in 2006 that ridership will increase substantially with the completion of the double tracking program. Double-tracking should resolve delays and improve on-time performance. With the double-track, SFRTA was also able to increase the frequency of train service by 33% to 40 daily trains. Currently there are plans to add eight additional trains per day in the near future.

- **Tri-Rail Trip Length Distribution:** Based on the winter trip table, the median (most common) trip-length on Tri-Rail is in the 10-15 mile range, comprising of almost 15% of all trips. However, the mean trip-length (total passenger miles divided by total passengers) is 30.4 miles, suggesting that there is substantial longer-distance traffic on Tri-Rail. This trip length distribution is rather typical of a transit system serving dispersed demand generators and attractors. The trip table analyses confirm that present Tri-Rail's traffic patterns are not dominated by the commuter market to and from Miami. As Tri-Rail currently operates, Metrorail is a strong attractor of traffic but weaker than would be typically

expected. A possible reason for this is the unattractive commuting path to downtown and from downtown Miami requiring a 21-minute Metrorail trip (plus an average of 3 minutes' wait time).

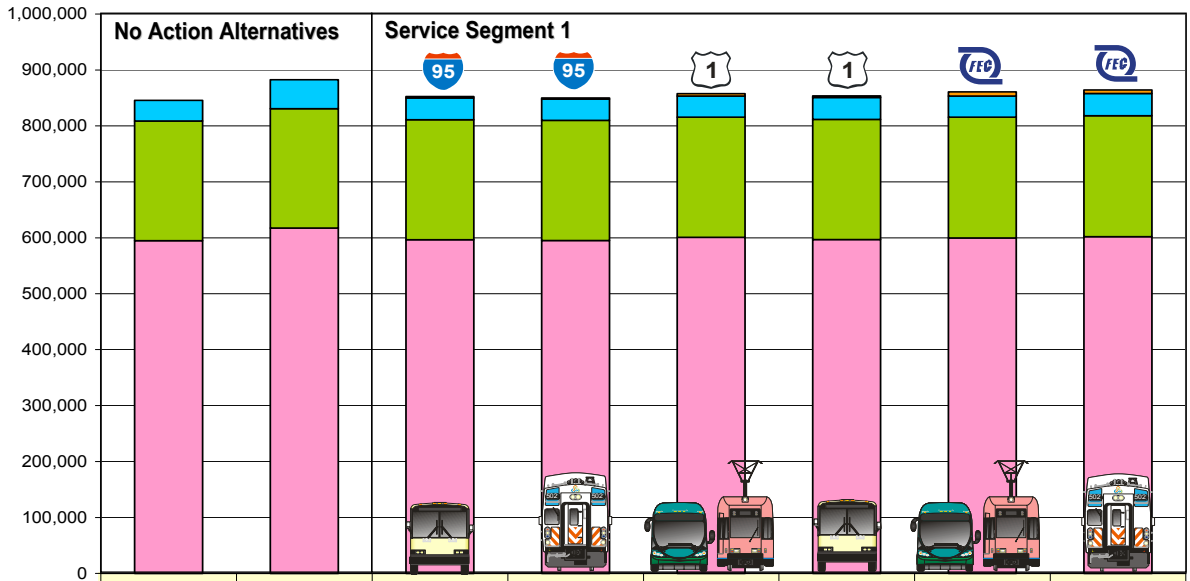
4.2.2. Ridership

A total of 15 runs of the 2030 travel demand forecast model were produced by the SFECCTA project team to provide an initial test of the preliminary alternatives. Two runs were made to model the "No Action" alternatives (No Build and TSM). Six runs modeled the alternatives associated with Service Segment 1 (Palm Beach North) that function to extend existing Tri-Rail service. Three additional runs consolidated corridor-length modeling of Service Segments 2 through 6 using different modal technologies (BRT, LRT and RGR) and alignments (US-1 and FEC). Another run consolidated the modeling of the two RRT alternatives on the FEC associated with Service Segments 5 and 6. The final three runs modeled the Special Analysis Segments (7 though 9). The results of the Service Segment 1 runs are summarized in **Figure 4.4** and the results of the Service Segment 4 through 6 runs are summarized in **Figure 4.5**. Note there is not a one-to-one correspondence between individual model runs and alternatives for these initial Tier I forecasts except for the Service Segment 1 alternatives.

As clearly illustrated in **Figure 4.4** and **Figure 4.5**, local bus services and Metrorail are forecasted as the predominant forms of public transportation in the region, collectively representing over 800,000 weekday passenger trips in the Year 2030.

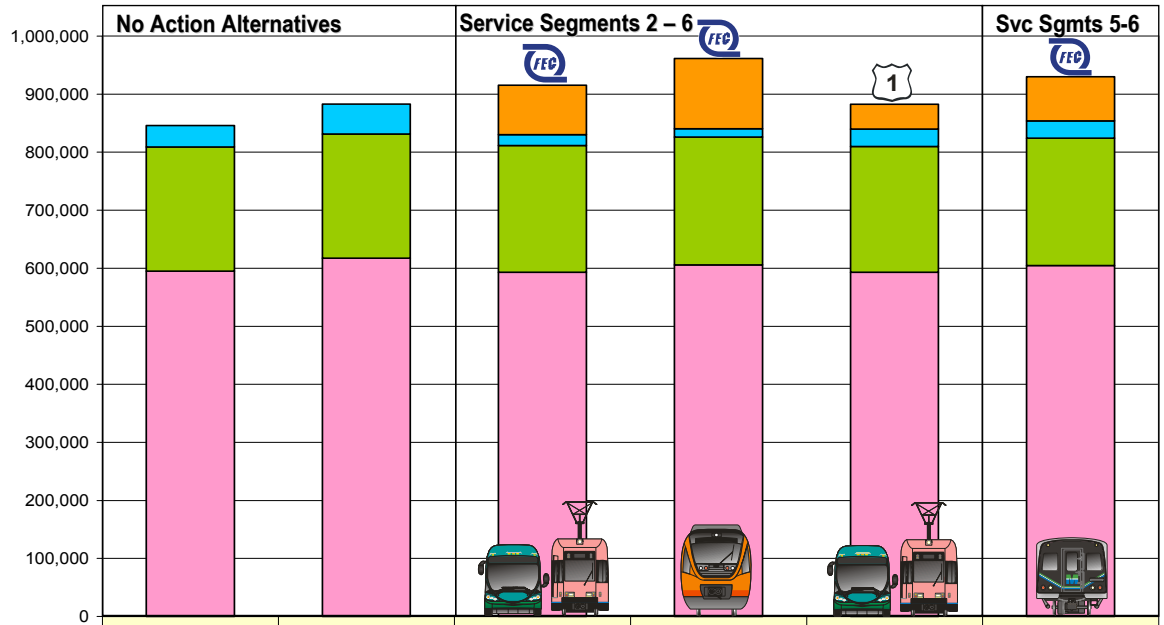
- The leading alternative in terms of system ridership are the alternatives operating RGR on the FEC alignment with about 961,000 weekday passenger trips, or 115,000 trips over the No Build alternative.
- RRT on the FEC was second, yielding 930,000 weekday passenger trips over a significantly shorter alignment (35 miles vs. 85 miles).
- BRT and LRT on the FEC alignment yield greater system ridership than comparable alternatives along US-1 alignments.
- Relatively short Service Segment 1 alternatives, designed as rubber-tired or steel-wheeled extensions of the existing Tri-Rail service, result in modest increases in systemwide ridership.
- Service Segment 1 alternatives yield modest ridership increases over the No-Build alternative, with a direct extension of Tri-Rail service to Northern Palm County over the FEC alignment leading the pack (46,000 weekday trips on existing Tri-Rail and extension combined), followed closely by a SRT extension from Mangonia Park over the FEC (with a combined weekday ridership of 45,000 trips).

Figure 4.4: 2030 Weekday Ridership Forecasts (Service Segment 1)



	No Build	TSM	RGB on I-95	RGR on I-95	LRT & BRT on US1	RGB on US1	LRT & BRT on FEC	RGR on FEC
Alternative	-	-	2,623	2,107	4,355	2,696	7,554	6,442
TriRail	36,700	51,759	38,847	38,210	37,561	38,995	37,655	39,734
Metrorail	214,144	213,756	214,690	214,668	214,963	214,984	215,987	216,341
Bus	595,065	617,365	596,666	595,416	600,937	597,146	599,944	602,163

Figure 4.5: 2030 Ridership Forecast



	No Build	TSM	LRT & BRT on FEC	RGR on FEC	LRT & BRT on US1	RRT on FEC
Alternative	-	-	85,200	120,649	42,613	76,122
TriRail	36,700	51,759	18,597	14,539	30,054	29,579
Metrorail	214,144	213,756	218,545	220,240	216,882	219,668
Bus	595,065	617,365	593,064	605,764	592,925	604,665

4.2.3. Relationship between Tri-Rail and Build Alternatives

A synergistic interrelationship was observed between Tri-Rail and the Build alternatives. In the No-Build alternative, Tri-Rail was modeled at 20 minute peak headways and 60-minute headways off-peak, consistent with the counties' Long Range Transportation Plans (LRTP), yielding about 37,000 Tri-Rail trips and about 846,000 transit trips systemwide. A TSM alternative was also modeled with Tri-Rail service augmented headways of 15 minute in the peak and 30 minutes off-peak (the so-called *"Tri-Rail-on-Steroids"* scenario), yielding about 52,000 Tri-Rail trips and 883,000 transit trips systemwide.

Each of the consolidated runs for Service Segments 2 through 6 generated significantly greater ridership than that forecasted for the No Action Alternative, reflecting the same relationship discussed above for systemwide ridership. Tri-Rail's share of ridership—while greater than today's ridership levels—is diminished in the build scenarios relative to a No Build and TSM alternative. A series of special model runs were conducted to better assess the affect of new SFECCTA passenger service on Tri-Rail ridership.

The initial model run for Service Segments 2 through 6 operating RGR on the FEC (Model Run 11) yielded 121,000 new trips for the new alternative, 961,000 transit trips systemwide, and increased ridership on Metrorail and local bus. Tri-Rail ridership, however, decreased to about 15,000 trips. In this run, Tri-Rail was modeled at LRTP headways (20/60) while the FEC service was modeled at 15-minute peak headways, 30-minutes off-peak north of Fort Lauderdale and half those headways south of Fort Lauderdale.

Two additional model runs were produced to test the affect of varying service headways:

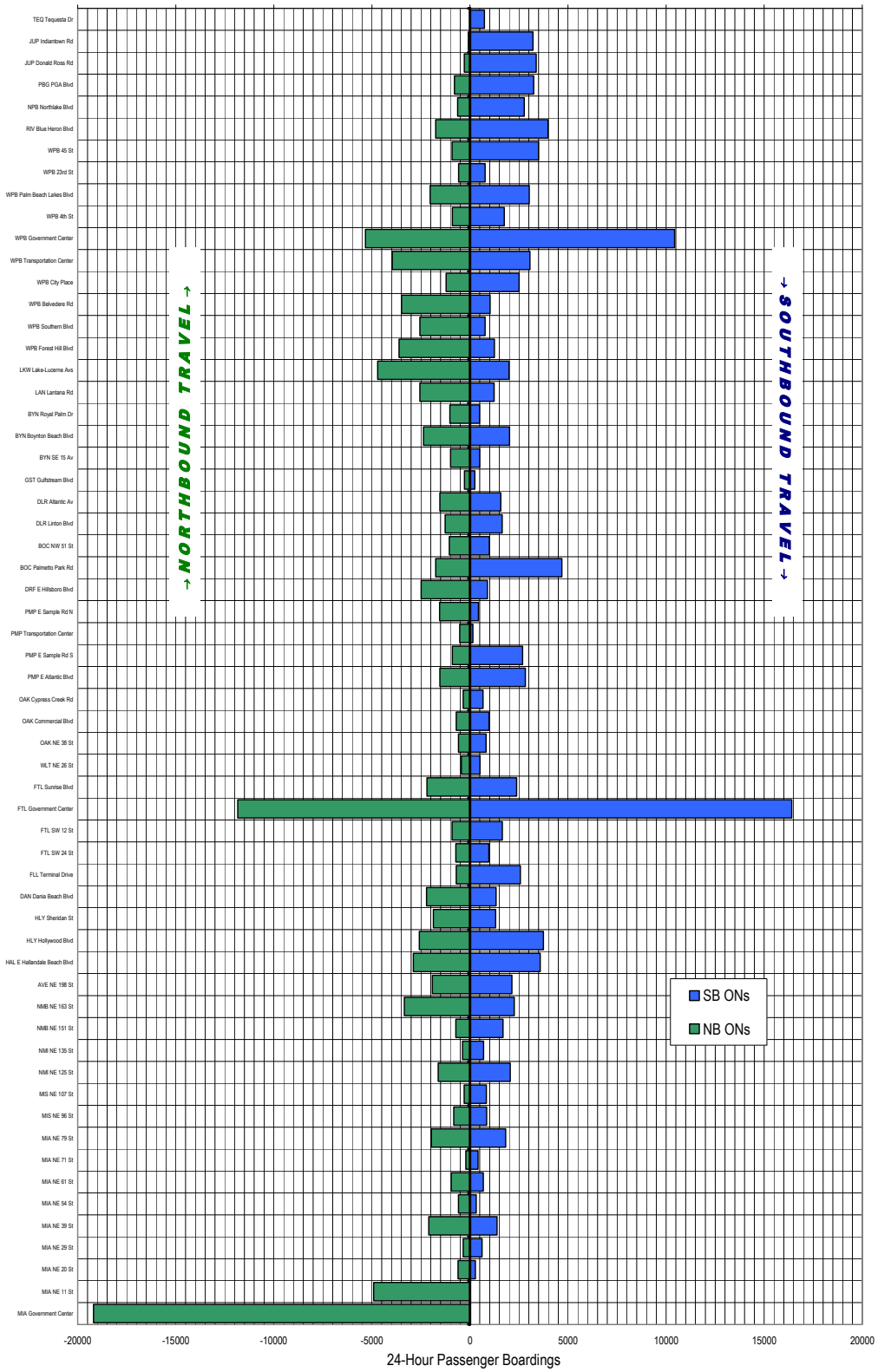
- Model Run 11A modeled 15/30 headways on both Tri-Rail and FEC, yielding 111,000 trips on the FEC alternative, 18,000 trips on Tri-Rail, and 954,000 trips systemwide.
- Model Run 11B modeled 15/30 headways on Tri-Rail but reduced FEC headways 20/60, yielding 72,000 trips on the FEC alternative, 35,000 trips on Tri-Rail, and 922,000 trips systemwide.

The conclusion drawn of these comparisons is that passenger rail service on the FEC would increase regional transit usage overall, but limit future Tri-Rail ridership relative to a No-Build alternative. This would be the case even if Tri-Rail service headways are increased to maximum levels and the FEC alternative headways are arbitrarily reduced below recommended levels. This disparity may be attributable to the higher residential and commercial development density in proximity to the FEC alignment.

- **Southern Termini Considerations:** Special model runs (Special Analysis Segments 7, 8 & 9 or SAS) were made to provide an assessment of the relative strength of a Downtown Miami and MIA southern termini for either service. The No Build alternative modeled the existing Tri-Rail service to MIA, yielding 36,700 weekday passenger trips, while SAS 9 (Miami Tri-Rail) modeled diversion of Tri-Rail service to Government Center and yielded a slightly higher 38,000 weekday passenger trips. In contrast, SAS 7 (Miami East Coast) modeled an FEC-length service to Government Center and SAS 8 (Airport East Coast) modeled an FEC-length service to MIA, yielding 86,900 and 82,400 trips on the FEC, respectively. While this analysis demonstrated a slight bias towards Downtown Miami relative to MIA as a southern terminus, it more importantly demonstrated the need to support regional access to both destinations and interconnectivity between Tri-Rail and any new SFECCTA alternative.

- **24-Hour Ridership Forecast:** Preliminary 24-hour station-level ridership information was also generated for each model run, which was also analyzed and described in detail in the technical memorandum, "SFECCTA Tier 1 Ridership Forecast Analysis", which is available upon request. As an example, **Figure 4.6** provides a graph of 24-hour weekday boardings at each station for a consolidated run of RGR on FEC for Service Segments 2 through 6, illustrating the profile of passenger activity by station across the length of the FEC corridor. **Figure 4.6** confirms the attractiveness of Miami, Hallandale, Hollywood, Fort Lauderdale, Boca Raton, Boynton Beach, West Palm Beach and Palm Beach Garden as trip destinations, as initially suggested by **Figure 2.4** in Chapter 2. It also highlights the relatively low ridership volume forecasted for Tequesta, the northern-most station in the SFECCTA study area at the top of the diagram. The low level of ridership demand identified for Tequesta, coupled with the relatively high capital cost of a new high-level crossing of the Loxahatchee River to reliably access the station area, suggests that Indiantown Road in Jupiter may be a more cost-effective northern terminus for SFECCTA alternatives in subsequent analyses.

Figure 4.6: 2030 24-Hour Passenger Boardings by Station (RGR on FEC)



- **Peak-Period Ridership Forecast:** Time-of-day factors were applied to the 24-hour travel demand forecast to produce a trip table of origins and destinations by station for the three-hour AM peak period, illustrated in **Figure 4.7. Figure 4.8** attempts to illustrate the origin and destination of AM peak period travel between groupings of stations. The diameter of boarding and alighting circles are proportional to the forecasted volume of passenger trips with origins or destinations within each group, respectively. The thickness of the lines connecting each pair of groups is likewise proportional to the relative volume of AM peak period travel. Finally, **Figure 4.9** illustrates the volumes of intra-county and inter-county travel forecasted for an RGR service on the FEC during the AM peak period. From these figures, passenger travel patterns can be discerned in greater detail than in the 24-hour ridership graph alone as follows:

  - Ridership as forecasted in general shows little regard for county boundaries.
  - Downtown Miami and West Palm Beach are evident as significant destinations for southbound travel in the AM peak period for travelers originating throughout the length of the corridor.
  - In contrast, a large amount of northbound travel originates at Government Center in Miami bound for downtown Fort Lauderdale.
  - There is virtually a turn-over of northbound seats at Fort Lauderdale.
  - Ridership at Miami-Dade County stations north of downtown are almost evenly split between destinations in Miami-Dade and Broward Counties.
  - There is a significant volume of ridership between stations north of West Palm Beach, between those stations and downtown West Palm Beach, and between Central Palm Beach County stations and downtown West Palm Beach.

Figure 4.7: 2030 AM Peak Period Passenger Boardings & Alightings by Station (RGR on FEC)

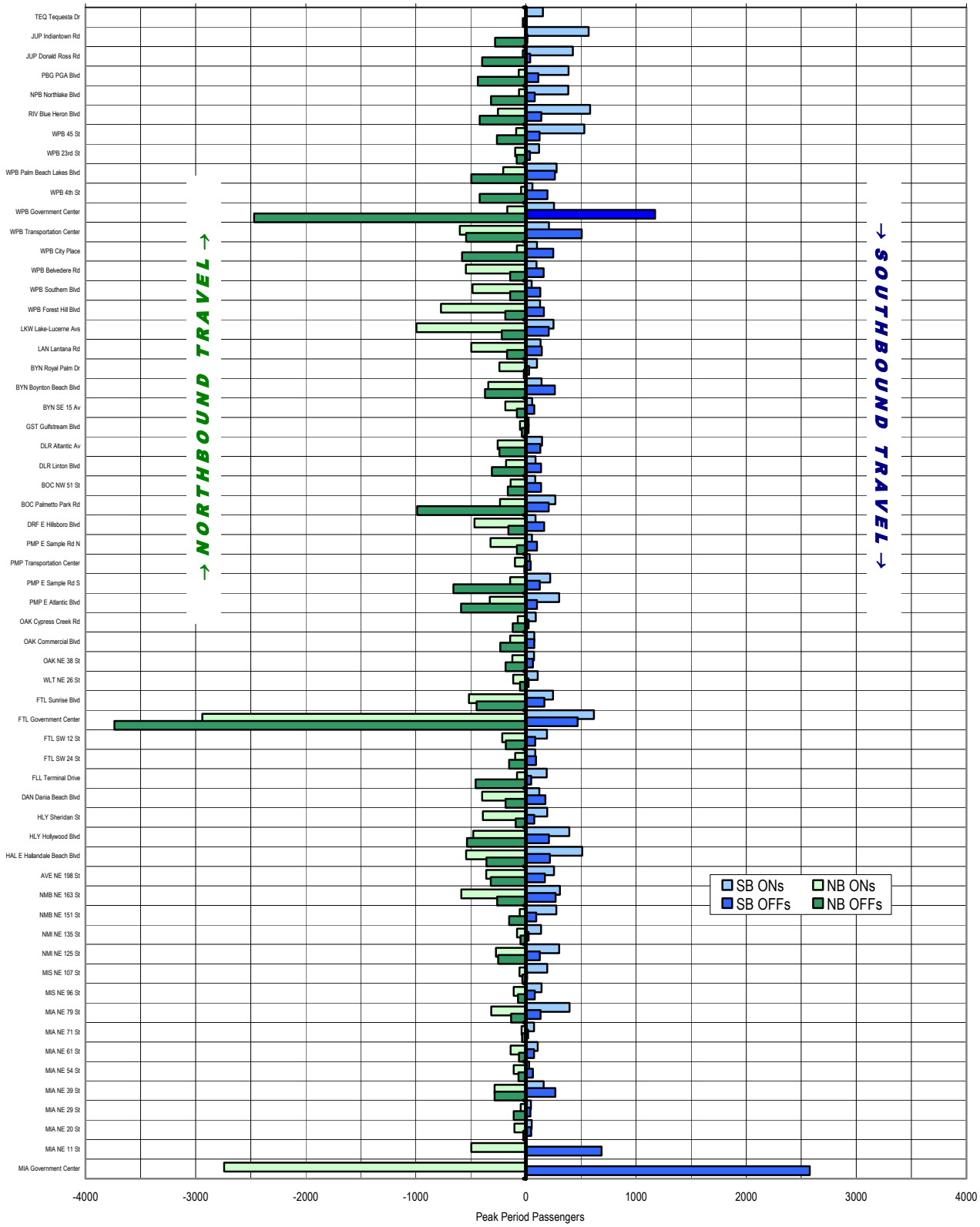


Figure 4.8: 2030 AM Peak Period Passenger Origins & Destinations by Station (RGR on FEC)

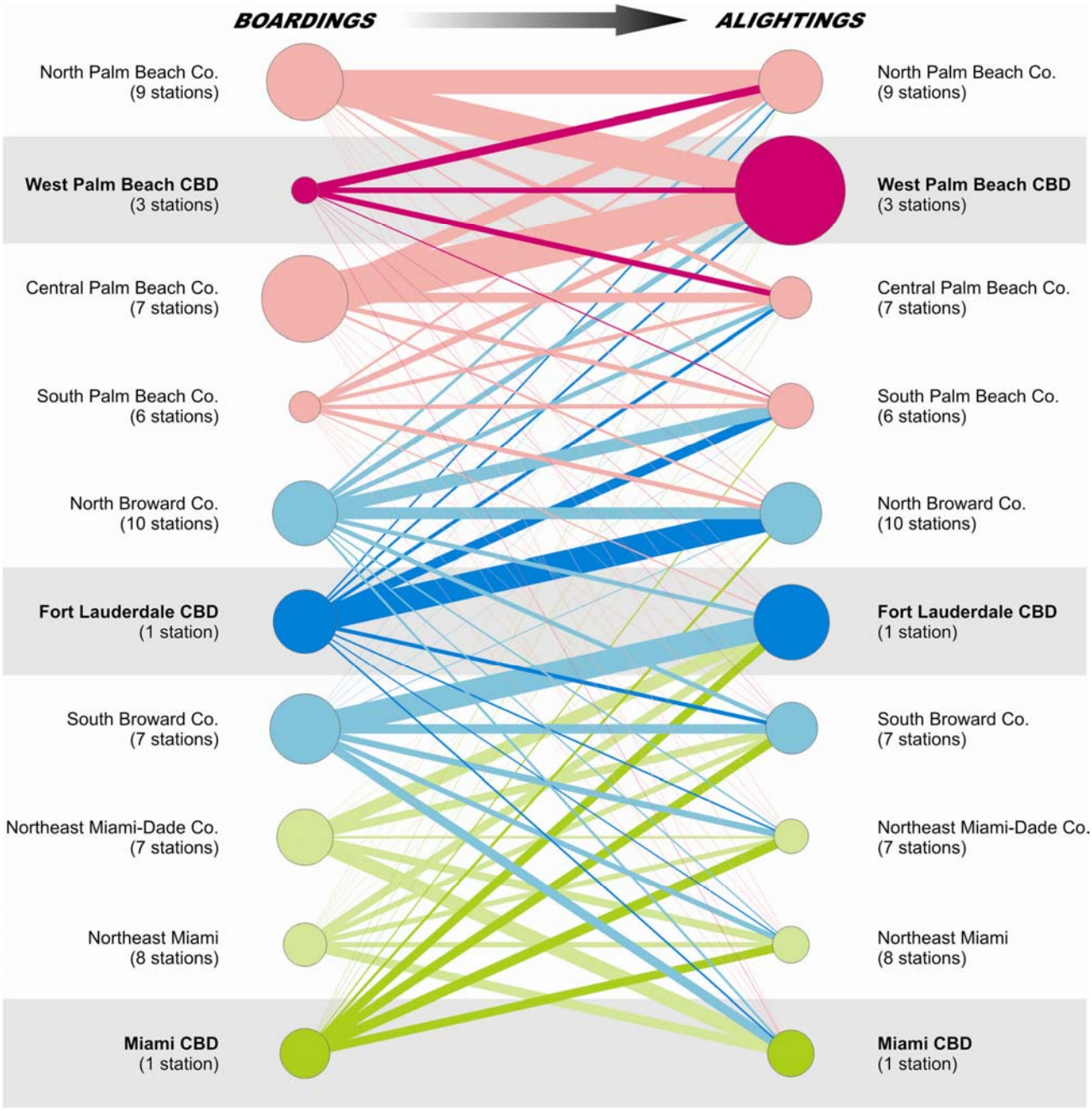
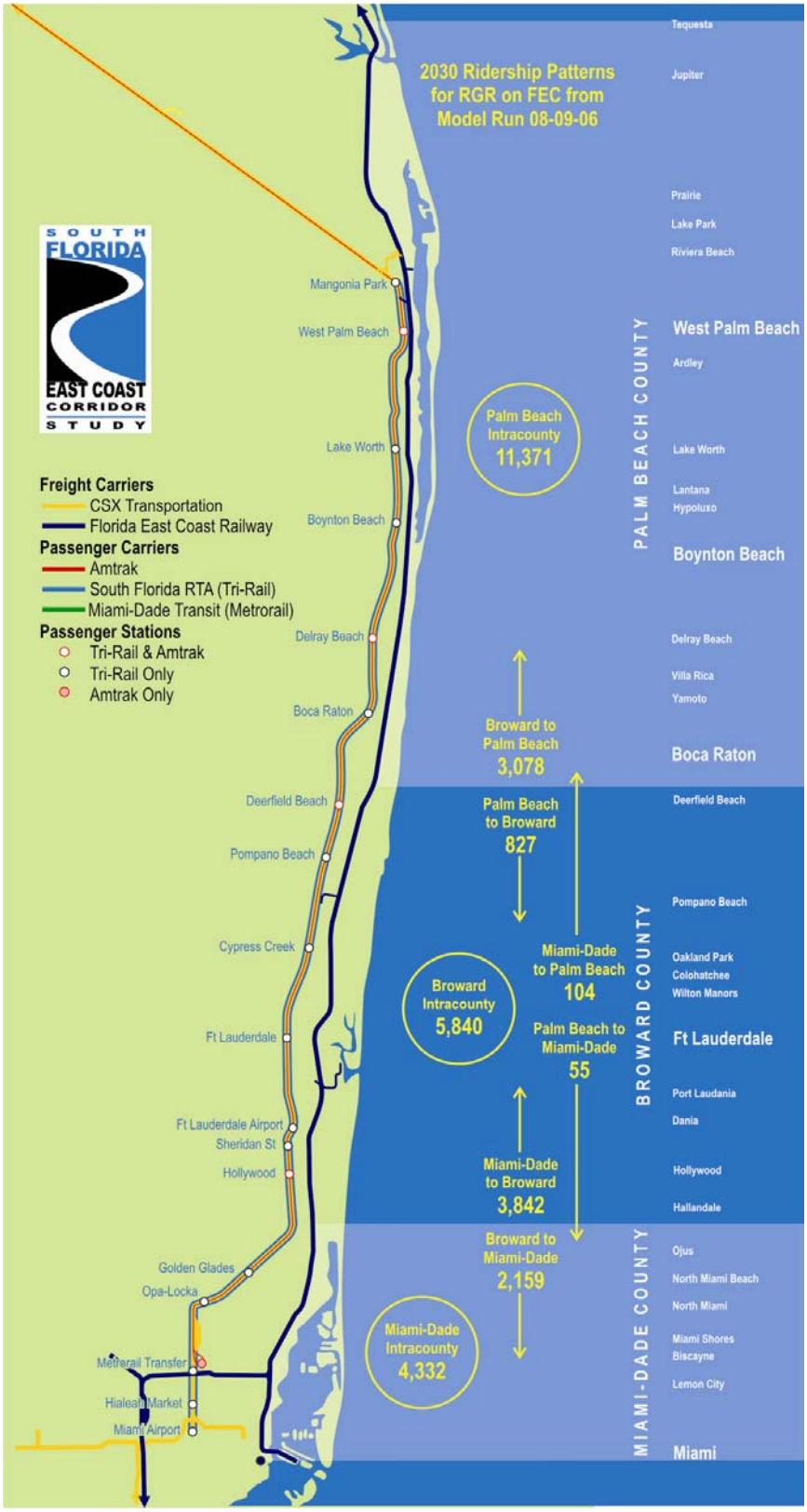


Figure 4.9: 2030 AM Peak Period Passenger Travel Patterns by County (RGR on FEC)



- **Safety and Security:** Safety and security are priorities with any system of public transportation. Both the FTA and FRA have requirements for systems being developed under their respective jurisdictions to produce system safety and security plans. The requirements for projects ramp up significantly as a project evolves from Preliminary Engineering through Final Design. There is little with respect to safety and security, however, to differentiate between alternative alignments or technologies as the ultimate goal of the systems safety and security development process is to result in equivalent levels of safety regardless of which alternative is selected. Safety statistics for public transportation in general tend to indicate that it is safer than comparable forms for surface passenger transportation **(Table 4.3)**. Therefore, traveler safety in the SFECC study area will increase in direct proportion to the number of travelers diverted from automobiles to transit.

Table 4.3: Public Transportation Safety

Surface Transport Mode	Number of Deaths per 100 Million Passenger Miles
Automobiles (General)	0.79
Vans, SUVs, Pick Up Trucks	0.76
Intercity Bus	0.02
Intercity and Commuter Railroads	0.03
Other Rail Transit	Not Reported
Bus Transit	0.01

Convenient and reliable transit options in the study area can also reduce vehicular congestion, thereby allowing greater access for emergency vehicles in and around a study area that includes several major hospitals.

4.3. Freight Train Operations

4.3.1. Florida East Coast Railway

Operations for the FEC Railway are based in Saint Augustine, Florida. The FEC is an independent Class II railroad, operating a 371-mile single-track mainline between Bowden Yard in Jacksonville and Hialeah Yard in Miami.

- **FEC Road Freights:** On weekdays FEC operates 11~12 northbound and 10~13 southbound road trains on the SFECC (road freight is a railroad term for through freight that is passing through, not serving local customers). The northbound operations consist of:

- Six daily trains carrying a mixture of intermodal boxes and carload shipments. Two are based in Fort Lauderdale and four go to Hialeah.
- Up to five daily rock trains moving aggregate from Miami-Dade County to points north.
- Every other day, an automobile carrier train is operated.

It's FEC's practice to fill-out its trains with carload traffic as tonnage and train length limits allow. Consequently, most trains carry some carload freight. All FEC intermodal trains originate or terminate in Jacksonville. Information on FEC freight operations is based on dispatching data provided by the FEC for ten representative days in 2005 and other sources.

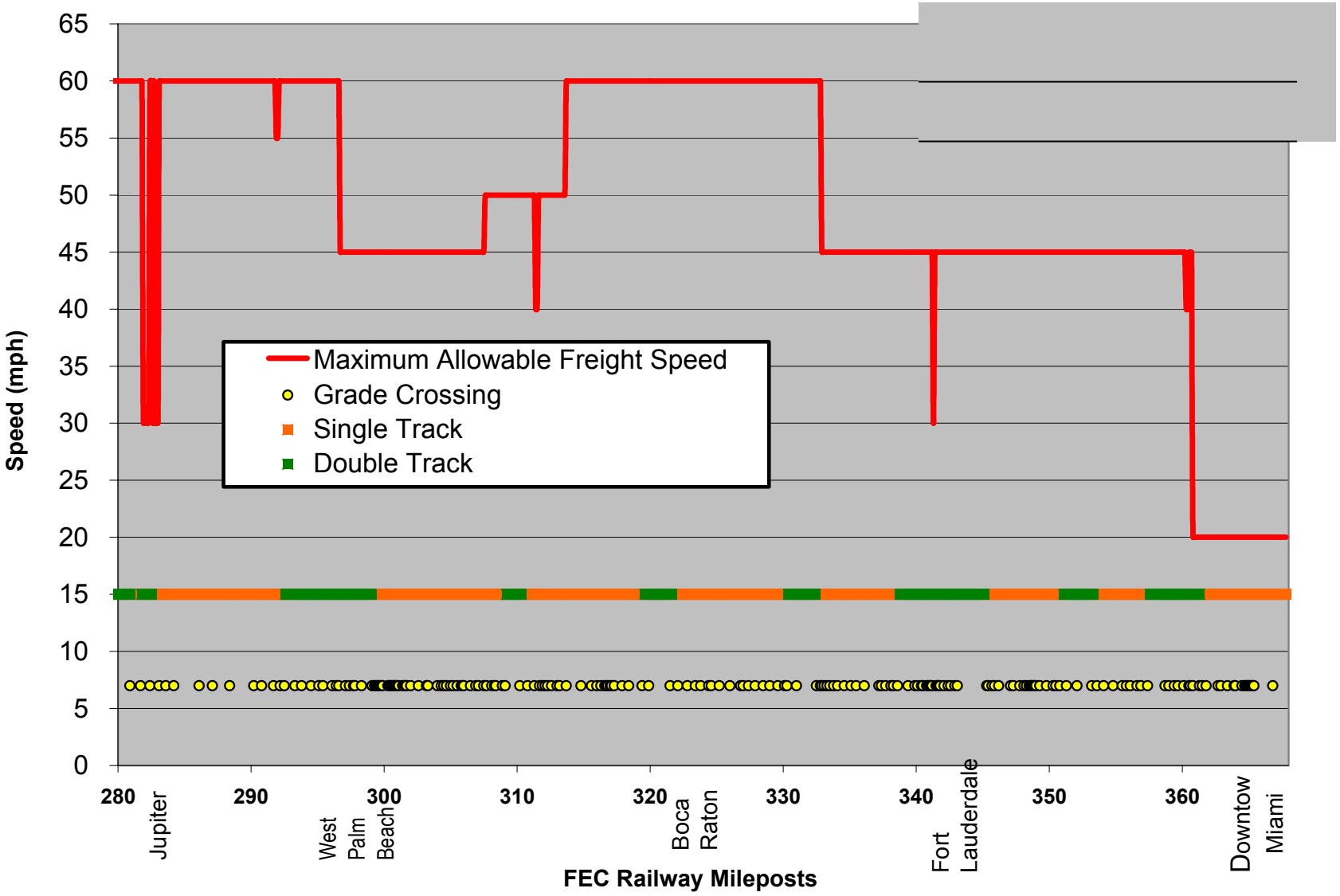
Table 4.4: FEC Study Area Road Trains by Type (Typical Weekday)

Train Type	Number Operated		Range of Typical Lengths (feet)
	Southbound	**Northbound**	
Mixed Traffic	7.0	6.0	7,000 – 8,000
Automobile	0.5	0.5	8,500
Rock	4.0	5.0	4,500 – 5,000
Total	**11.5**	**11.5**	

With delays for meets and passes, the typical FEC freight train requires approximately 9½ to 10 hours to travel between Jacksonville and Miami for a commercial velocity of approximately 39 mph. The time required to traverse the southern most 128 miles of the route between Miami and Fort Pierce is 3 to 4 hours for a velocity of approximately 36 mph.

The line is maintained as a single track railway with numerous passing sidings to accommodate the bidirectional movement of trains and work for local customers. The track is generally maintained to a standard that allows freight trains to operate at a maximum allowable speed of 60 mph. A speed profile for the FEC line in the study area is shown in **Figure 4.10**.

Figure 4.10: Freight Speed Profile – Jupiter to Downtown Miami



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FEC operates trains on the railway at all times but the density of operations is greatest after 4:00pm until 9:00am the following morning. The slow midday period allows FEC to serve local customers and perform maintenance work with reduced interference. **Table 4.5** reports mainline freight traffic densities by time of day along the most heavily used portion of SFECC near Fort Lauderdale.

Table 4.5: Typical Freight Train Volumes by Time of Day at FLL Airport Interlocking

Time period	Average		Typical Trains Counts	
	Road Trains per Hour	Local Trains On Main	Northbound	Southbound
Midnight to 6am	1.8		6	5
6am to 9am	1.3	0.7	2	2
9am to 4pm	0.5	1.0	1	3
4pm to 7pm	1.0	0.3	2	1
7pm to Midnight	1.0		3	2

FEC traffic has been increasing in recent years. Overall in 2005 the FEC carried 550,000 carloads of traffic. Continued increases in freight rail volumes should be anticipated with a corresponding increase in the number of trains. Approximately one third of the intermodal traffic moving on the FEC are containers moving through the region's three major seaports.

- **Local Trains:** The FEC maintains three principal yards within the SFECCTA study area, Hialeah, Fort Lauderdale and West Palm Beach. Each yard has local trains which serve online customers. On a weekday one or two local trains serve customers on the mainline near Fort Lauderdale. One local works from West Palm Beach, and one train works from Hialeah. Those local trains serve 26 online customers, 14 of which are active. The online customers primarily ship building materials (10), food products (3) and paper (1). Local trains tend to operate on the mainline between 9:00am and 4:00pm.

4.3.2. South Florida Rail Corridor

All freight operations on the SFRC (Tri-Rail) alignment are conducted by CSXT of Jacksonville, Florida. CSXT, one of the nation's seven Class I, operates in 23 eastern states over a 22,000-mile route. Florida DOT purchased the SFRC from CSXT in 1988 but CSXT retained a perpetual and exclusive easement to operate freight service on this line under the terms of the sale. However, dispatch control over the SFRC is scheduled to be transferred to FDOT in the near future.

CSXT operations on the line consist of two to four daily manifest trains of carload commodities predominantly destined for warehouses along the line in Broward and Miami-Dade Counties and up to

two daily rock trains moving aggregate from Miami-Dade County to points north. Information on SFRC freight operations is based on dispatching data provided by CSXT for eight consecutive representative days in 2000, and more recent local train observations. Unlike the FEC, CSXT's volume of intermodal container and trailer on flat car freight is negligible.

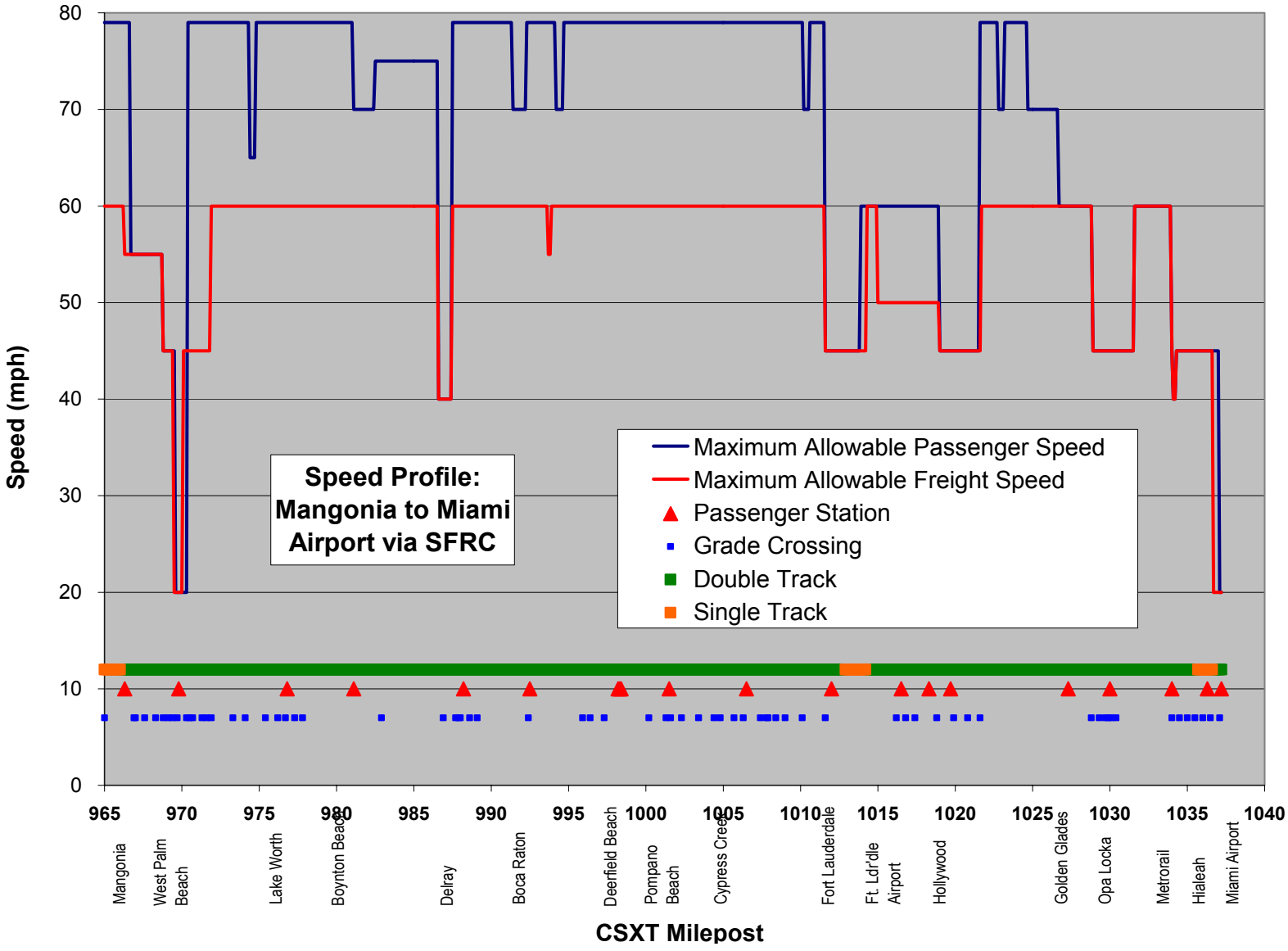
- **Road Freights:** On weekdays CSXT operates 2~3 northbound and 2~3 southbound road trains. One or two trains in each direction carry carload freight to businesses in Miami-Dade and Broward Counties. One or two northbound rock trains operate between 10:00 PM and 2:30 AM. The corresponding empties are returned southbound when required.

Table 4.6: Typical Passenger and Freight Train Volumes by Time of Day at Fort Lauderdale

Time period	Commuter Trains	Amtrak Trains	CSXT Road Freight Trains	CSXT Local Freight Trains	Total Trains
Midnight to 6am	2	0	4	2	8
6am to 9am	10	1	0	0	11
9am to 4pm	14	1	0	0	15
4pm to 7pm	8	2	0	0	10
7pm to Midnight	6	0	2	2	10
Total	40	4	6	4	54

The typical CSXT freight train requires 2 hours to travel between Mangonia Park and Miami for a commercial velocity of approximately 35 miles per hour. The line is maintained as a double track railway with numerous crossovers. The track is generally maintained to a standard that allows freight trains to operate at a maximum allowable speed of 60 mph. A speed profile for the CSXT / SFRC line in the study area is shown in **Figure 4.11.**

Figure 4.11: Speed Profile of the Passenger Corridor



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- **Locals:** CSXT typically operates five daily local trains. Three operate overnight. Two operate during the midday period. Some local trains operate on Saturday on an abbreviated schedule. No local trains were observed to operate on Sundays.

Table 4.7: Typical Weekday Local Train Activities

Local Train	Train	Train Start	Extent of Territory	Tie-up time
Ft. Lauderdale	O717	20:00	Deerfield Beach	1:30
Fort Lauderdale	O718	21:00	Varies	Varies
Pompano South	O719	1:00	Varies	9:30
Miami Plantation	O722	7:00	Dania	14:15
Dyer South	O716	10:00	Lake Worth	17:00

4.3.3. Freight Integration Analysis

The freight integration study explores options available to shift or restructure freight operations on both the FEC and the SFRC in the event that proposed passenger services present substantial conflicts with current and future freight use of the lines. The analysis considers the physical, operational, economic, competitive and institutional viability of configuring the region's rail freight network in several ways. This work focuses on the development and evaluation of three scenarios (**Figure 4.12**):

- **Status Quo** – Current freight operations restricting FEC trains to SFECC and CSXT trains to the SFRC are preserved.
- **SFRC Freight Spine** – All through operations of FEC are rerouted to the SFRC
- **Western Freight Bypass** (WBP) – All through operations of FEC and CSXT are rerouted to new rail line on the eastern edge of the Everglades.

Up to 18 current daily FEC trains are candidates for potential rerouting, based on current traffic patterns. Four local trains, four trains based in Fort Lauderdale serving PEV, and two rock trains between Miami-Dade County and West Palm Beach are not viable candidates for rerouting.

On average two current daily CSXT trains are candidates for potential rerouting. Four local trains and two general merchandise trains are not viable candidates for rerouting from the SFRC.

The future scenario (with growth in freight traffic) assumes up to 24 FEC daily trains and six CSXT trains would be candidates for rerouting.

Figure 4.12: SFECCTA Freight Alignments

➢ **SFRC Freight Spine**

- Two new connections between the SFRC and FEC would be required: a northern connection in the vicinity of Mangonia Park, and a southern connection at Iris near the Tri-Rail /Metrorail intermodal station. No other infrastructure improvements were assumed.
- The analysis integrates 24 FEC through freight trains with 50 Tri-Rail trains, four Amtrak trains, six CSXT road freights, appropriate CSXT local freight train access and required maintenance of way windows.
- Overall, the current pattern of FEC operations can be maintained with adjustments of less than 15 minutes for all but two northbound rock trains.
- The difference in mileage between the FEC and SFRC routes is negligible for the purposes of economic route costing algorithms.
- Train performance calculations find FEC trains can be interoperated with most local passenger service. FEC trains would be prohibited from SFRC for approximately 3.5 hours each day when passenger trains are operating at 20 minute headways. (Heavily loaded rock trains as presently operated are not suitable for interoperation with passenger services. Adding a fourth locomotive to the rock trains would allow them to operate during off peak periods.)
- Relative to highway safety, the SFRC Spine would reduce train crossings on the SFECC by 80% on the typical weekday but increase train crossings on the SFRC by 47%.
- For the typical FEC through freight train, the SFRC route could be up to 30 minutes faster than current operation by avoiding meet-pass delays on the current route. These delays may be reduced in the future by a state-funded capacity improvement near Boynton Beach. Also some increased speed on the SFRC would be eroded waiting for operating windows between passenger trains.
- The team could not accurately assess how the introduction of up to 24 FEC freight trains on the SFRC corridor would affect the reliability of passenger service delivery.
- The FEC has numerous concerns about the SFRC Spine scenario. These include: the need to maintain redundant freight capacity since the SFECC would not be abandoned, the prospect that duplicative maintenance costs would be paid by the FEC through SFRC track access fees, FEC train crews would be required to qualify on SFRC/CSXT rules and territory, SFRC operation without ATC signal protection provided by SFECC, possibly increasing risks and liability, possible erosion of freight service quality as the FEC competes for track time with passenger trains, and loss of control of freight dispatching and maintenance of way.

- The SFRTA also has many concerns relating to the SFRC Spine scenario, including: prospect that 24 new freight trains on the line would impact Tri-Rail service reliability, freight traffic may conflict with future improvements in passenger service, increased infrastructure wear-and-tear from dramatically increased volume of freight traffic, fewer and shorter windows for maintenance of way due to freight traffic, increased need to "wrong-rail", platform occupancy issues at Mangonia Park, and increased potential for noise complaints.

➢ **Western Bypass**

- The Western Bypass would construct 130 miles of new Class 4 mainline track. The Bypass requires 60 miles of new right of way, at least three new bridges, 31 control points, 43 new turnouts, six new grade crossings, 51 upgraded grade crossings and 13 new or rebuilt passing sidings.
- The WBP would allow the corridor's railroads to reroute up to 24 FEC through freight trains and six CSXT through freight trains off lines in densely populated areas.
- For the typical freight train, the trip times on the Western Bypass will remain fairly similar to that achieved on the current routes.
- The difference in mileage between the original routes and the Western Bypass is negligible.
- As envisioned, the Bypass would entail a new right-of-way in the Everglades approximately 1,200 ft to the west of the current U.S. 27 alignment and/or substantial reconstruction of at least six highway interchanges.
- Substantial drainage management and environmental mitigation may be required. The potential disruption to the sensitive Everglades ecosystem may prove simply unacceptable.
- The present owner of the Western Bypass alignment in the Everglades has not been determined, and it is not clear that cooperation from the current railway controlling the northern 45 miles of the new alignment would be forthcoming.
- From a highway safety perspective, the WBP could feature 155 fewer grade crossings than the FEC, and 15 fewer than the SFRC. FEC trains moving from Hialeah to Fort Pierce could encounter only 57 grade crossings.
- The construction of a new infrastructure and upgrade of branch line track will result in a substantial additional ongoing maintenance burden. FEC is concerned that it may be saddled with unproductive and duplicative maintenance burden (whether directly or through track-access charges) under this scenario.

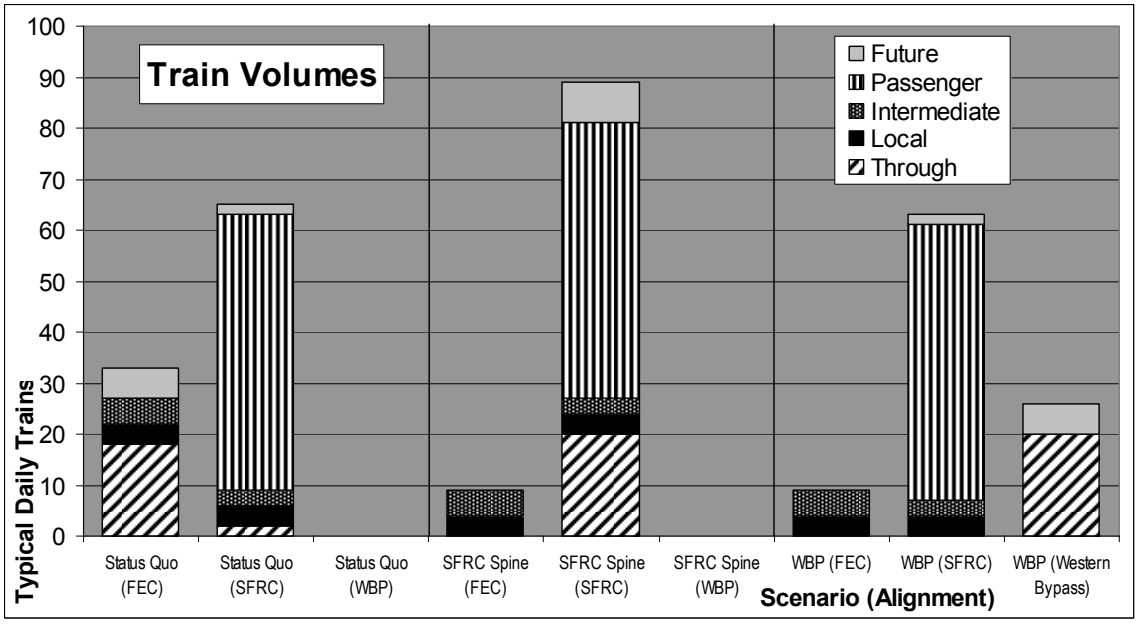
- The FEC is concerned that it would be difficult to grow on-line businesses and/or expand intermodal terminal capacity along the Western Bypass since the sensitive ecosystem in the Everglades would be disturbed by the development of freight terminals along the route.

- In contrast, the SFRTA notes that the environmental impacts and costs of upgrading the SFECC to provide both freight and passenger service may be greater than the environmental constraints and expenses encountered in constructing the Western Bypass.

➢ **Comparative Analysis:** The study evaluates the three scenarios on several dimensions. Comparative findings on each dimension are provided below.

- Freight Operations and Train Movements - On a typical day under the Status Quo scenario the SFECC would operate 18 through freight trains, five intermediate freight trains and four local freight trains. With the SFRC Spine scenario, all 18 through freight trains would be rerouted to the SFRC. Under the WBP scenario the same 18 FEC trains and two CSXT trains would be rerouted to the Western Bypass.

Figure 4.13: Typical Daily Trains Volumes by Scenario and Alignment



Under the Status Quo, the SFRC hosts twice the train volume of the FEC. FEC carries mainly freight whereas SFRC carries mainly passenger trains.

The SFRC Spine scenario shifts all through FEC freight to the SFRC, bringing its future daily train count to 88.

Under the Western Bypass Scenario, the through FEC trains are absorbed by a new bypass alignment instead of the SFRC.

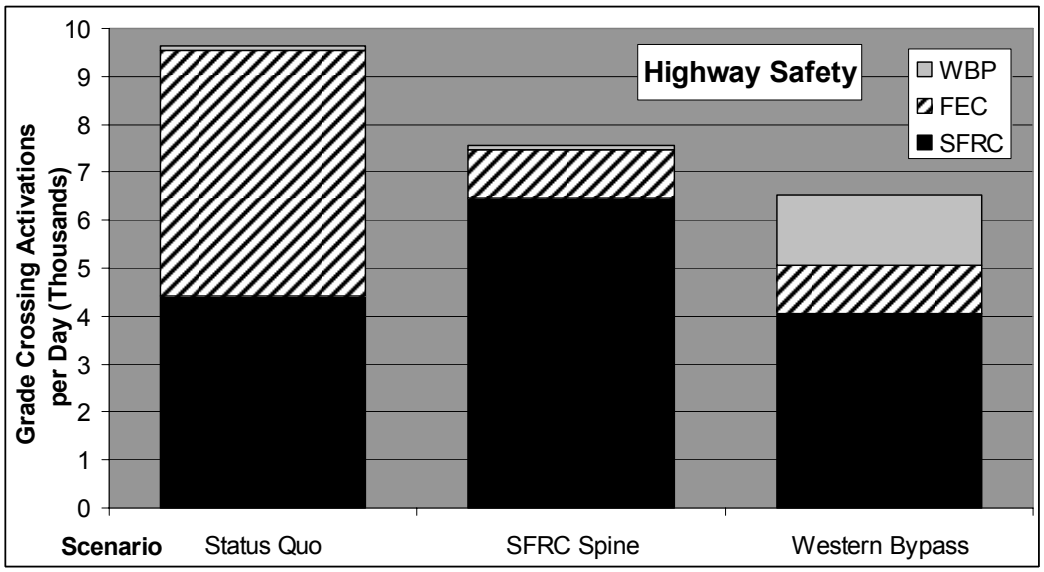
- **New Infrastructure Required:** No new infrastructure is required for the Status Quo freight operations, but maintaining the Status Quo may require substantial investment on the SFECC to allow frequent passenger commuter rail service in that corridor. The alternative freight integration scenarios require investment in freight facilities; however, the Western Bypass is by far the more expensive alternative.

Table 4.8: New Infrastructure Required

	Right of Way (Miles)	Track (Miles)
Status Quo	0	0
SFRC Spine	4	17
Western Bypass	60	173

- **Highway Safety:** One goal of the freight integration is to reduce grade crossing risks. Grade crossing accident risk is partially a function of the daily grade crossing train occupancies.

Figure 4.14: Typical Daily Train Crossings



Under the Status Quo, the SFECC accounts for about half of all grade-crossing activations. The SFRC Spine scenario shifts many through freight trains onto the SFRC, reducing grade-crossing activation counts for those trains. Although the total number of activations increased on the SFRC, the activations on the SFECC decreased much more. The Western Bypass (WPB) scenario reduces grade crossing risk exposure even further.

- **Economics:** All three scenarios are essentially identical with respect to the operating mileage and travel times required for service. Both of the carriers are unlikely to incur substantially different "above the rail" operating costs due to the proposed reroutings. However, development of WBP would dramatically increase "below the rail" (infrastructure) cost for rail infrastructure in the region by adding almost 175 new main line miles of track to the regional rail network.

- **Competitive and Institutional Concerns:** The FEC Railway is a very successful regional freight carrier in Florida. It carries at least four times more traffic in the corridor than CSXT, including all the premium intermodal, express and automobile traffic. CSX Transportation is a major Class I railroad, but its South Florida franchise suffers from the lower costs of the FEC Railway.

  The presence of CSXT in the South Florida is an important competitive force in the region. CSXT's operation provides a service floor and a price ceiling for rail freight services. Without the CSXT, the market forces limiting the FEC pricing and service strategy would be relaxed. South Florida would be well advised to preserve and encourage rail freight competition.

  Institutionally, both the FEC Railway and CSXT are federally regulated railroads engaged in interstate commerce. The railroads are private property with special protections from regulation and interference by states and localities. States and localities in most matters must deal with the railroads as peers since they are immune from many state powers. In exchange for these protections, the railways have common carrier obligation that prohibits them from denying service to freight customers or from closing a freight line.

  The most salient institutional considerations that will circumscribe the possible integration of regional freight operations revolve around three points. First, the State of Florida's influence on CSXT or FEC to reroute any of their trains to an alternative route is very limited or nonexistent. Second, neither FEC nor CSXT are free to abandon freight operations on their lines. Third, CSXT is free to block FEC trains from using the SFRC. Conversely, the FEC Railway is free to block CSXT trains from using the SFECC.

  The regional competitive impacts of the SFRC Spine operation would be neutral at best. FEC Railway and CSXT service would share infrastructure but remain essentially unchanged. However, FEC's flexibility to unilaterally innovate and grow would be curtailed by the need to coordinate with other users of the Spine. The institutional hurdles associated with the SFRC Spine scenario are formidable. It seems that the SFRC Spine scenario would only be attractive if circumstances surrounding development of passenger services along the SFECC were sufficiently grave to force the State to consider a fallback option.

The Western Bypass would create uncertainty and risk for the FEC in many of the same areas as the SFRC Spine. FEC still would demur rerouting a key segment of its network over a mainline shared with other operations and dispatched/maintained by a third party as long the FEC had the option to use its current route. The new route would not relieve either the FEC Railway or CSXT of their obligations to customers on their existing mainlines and would therefore be redundant. However, in contrast to the SFRC Spine, the Bypass would not be shared with 54 passenger trains. Consequently, the risk for freight train delays due to conflicts with passenger trains would be ameliorated.

Institutionally, it has not been determined how the South Central Florida Express (SCFE) Railroad on the northern end of the Bypass would interact with CSXT and FEC in the creation and operation of the WBP. SCFE's lease for 45 miles of the former FEC K-branch expires in 2025. Assuming that SCFE is amenable to cooperating with Florida to build and operate the Bypass, the State would not be enjoined from inviting both FEC and CSXT to use the new facility. However, the State still could not force either carrier to use the new facility. Neither CSXT nor FEC would be able to completely abandon the lines they are currently using for freight service, due to obligations to serve communities and stations that are not on the Bypass route.

5.1. NEPA Evaluation

The regulations of the Council on Environmental Quality (CEQ) implementing NEPA ensure that information on the social and environmental impacts of any federally funded action is available to public officials and citizens before decisions are made and before actions are taken.[5] It is the intent of the SFECCTA, through this Tier 1 Draft PEIS, to comply with NEPA and CEQ regulations and carry that compliance into Tier 2 of the study for independent project segmental studies. Much of the information presented in this chapter is documented in **Tables 5.1 – 5.3** which are matrices comprising the Environmental (NEPA) Analysis Summary chart (see the oversize sheet in the sleeve following this page).

5.1.1. Performance in Satisfying Purpose and Need

All the alternatives were qualitatively evaluated to determine their performance in satisfying the purpose and need and goals and objectives. The ultimate ranking of the alternatives in relation to these factors are represent in columns 1 and 2 of **Table 5.4** which is the final evaluation matrix for the alternatives.

5.1.2. Comparative Benefits and Environmental Effects

The evaluation matrix presented in **Table 5.4** was developed to capture and assess the alternatives compliance with the following FTA criteria:

- **Effectiveness** – the extent to which alternatives solve the stated transportation problems in the corridor and address the purpose and need;
- **Impacts** – the extent to which alternatives affect (can be positive or negative) the natural and physical environment including natural resources, neighborhoods, air quality, the adjacent transportation network and facilities, land use, the local economy, etc.;

Table 5.1: Land Use Data and Alternatives Analysis Matrix

Table 5.2: Census Data and Alternatives Analysis Matrix

Table 5.3: NEPA Evaluation Criteria and Alternatives Analysis Matrix

(Refer to Oversized Graphic **–** Environmental (NEPA) Analysis Summary in the following insert sleeve)

[5] http://www.fta.dot.gov/7700_ENG_HTML.htm

Table 5.4: Summary of Alternatives Evaluation Relative Rankings

Purpose & Need	Goals & Objectives	Transportation System Impacts	Land Use	Socio-Economic	NEPA	Ridership	Capital Cost/Mile
Segment 1							
		1. I-95 1RGB1/1RGB1A					
1. All FEC Alternatives	1. I-95 1RGB1/1RGB1A		1. All US-1 Alternatives	1. All US-1 Alternatives	1. I-95 1RGB1/1A	1.FEC 1RGR1/1A	1.I-95 1RGB1
		2. I-95 1RGR2			2. FEC 1RGR1/1A	2.FEC 1BRT2A/1LRT2A	1.US-1 1RGB2
	2. All FEC Alternatives				3. FEC 1BRT2A/1LRT2A	3.US-1 1BRT1/ 1LRT1	2.I-95 1RGB1A
2. All US-1 Alternatives			2. All FEC Alternatives	2. All FEC Alternatives	4. I-95 1RGR2	4.US-1 1RGB2/2A	2.US-1 1RGB2A
	3. All US-1 Alternatives	3. US-1 1RGB2/2A			5. US-1 1RGB2/2A	5.I-95 1RGB1/1A	3.FEC 1LRT2A
		4. All FEC Alternatives			6. FEC 1RGR1/1A	6.I-95 1RGR2	4.FEC 1RGR1A
3. All I-95 Alternatives	4. I-95 1RGR2		3. All I-95 Alternatives	3. All I-95 Alternatives	7. US-1 1BRT1/1LRT1		5.FEC 1RGR1
		5. US-1 1BRT1/1LRT1					6.US-1 1BRT1
							7.US-1 1LRT1
							8.I-95 1RGR2
Segment 2							
1. All FEC Alternatives		1. FEC 2BRT2/2LRT2				1. FEC 2RGR1	1. FEC 2BRT2
	1.All FEC Alternatives		1. All US-1 Alternatives	1. All FEC Alternatives	1. All FEC Alternatives		2. FEC 2LRT2
2. FEC 2BRT2/2LRT2		2. FEC 2RGR1				2. FEC 2BRT2/2LRT2	3. FEC 2RGR1
	2. All US-1 Alternatives		2. All FEC Alternatives	2. All US-1 Alternatives	2. All US-1 Alternatives		4.US-1 2BRT1
3. All US-1 Alternatives		3. All US-1 Alternatives				3. US-1 2BRT1/2LRT1	5. US-1 2LRT1
Segment 3							
1. All FEC Alternatives	1. FEC 3BRT2/3LRT2	1. FEC 3BRT2/3LRT2				1. FEC 3RGR1	1. FEC 3BRT2
			1. All US-1 Alternatives	1. All FEC Alternatives	1. All FEC Alternatives		2. FEC 3RGR1
2. FEC 3BRT2/3LRT2	2. FEC 3RGR1	2. FEC 3RGR1				2. FEC 3BRT2/3LRT2	3. FEC 3LRT2
			2. All FEC Alternatives	2. All US-1 Alternatives	2. All US-1 Alternatives		4. US-1 3BRT1
3. All US-1 Alternatives	3.All US-1 Alternatives	3. All US-1 Alternatives				3. US-1 3BRT1/3LRT1	5. US-1 3LRT1
Segment 4							
1. FEC 4RGR1	1. FEC 4RGR1	1. FEC 4BRT2/4LRT2				1. FEC 4RGR1	1. FEC 4BRT2
			1. All US-1 Alternatives	1. All FEC Alternatives	1. All US-1 Alternatives	2. FEC 4BRT2/4LRT2	2. FEC 4LRT2
2. FEC 4BRT2/4LRT2	2. FEC 4BRT2/4LRT2	2. FEC 4RGR1					3. FEC 4RGR1
			2. All FEC Alternatives	2. All US-1 Alternatives	2. All FEC Alternatives		4. US-1 4BRT1
3. All US-1 Alternatives	3. All US-1 Alternatives	3. US-1 4BRT1/4LRT1				3. US-1 4BRT1/4LRT1	5. US-1 4LRT1

Purpose & Need	Goals & Objectives	Transportation System Impacts	Land Use	Socio-Economic	NEPA	Ridership	Capital Cost/Mile
Segment 5							
1. FEC 5RRT1	1. FEC 5RGR1	1. FEC 5RRT1, 5BRT2/5LRT2				1. FEC 5RRT1	1. FEC 5BRT2
2. FEC 5RGR1	2. FEC 5RRT1		1. All US-1 Alternatives	1. All FEC Alternatives	1. All FEC Alternatives	2. FEC 5RGR1	2. FEC 5LRT2
							3. FEC 5RGR1
3. FEC 5BRT2/5LRT2	3. FEC 5BRT2/5LRT2	2. FEC 5RGR1				3. FEC 5BRT2/5LRT2	4. FEC 5RRT1
			2. All FEC Alternatives	2. All US-1 Alternatives	2. All US-1 Alternatives		5. US-1 5BRT1
4. All US-1 Alternatives	4. All US-1 Alternatives	3. All US-1 Alternatives				4. US-1 5BRT1/5LRT1	6. US-1 5LRT1
Segment 6							
1. FEC 6RGR1	1. FEC 6RGR1	1. FEC 6RRT1				1. FEC 6RRT1	1. FEC 6BRT2
2. FEC 6RRT1	2. FEC 6RRT1	2. FEC 6BRT2/6LRT2		1. All FEC Alternatives	1. All FEC Alternatives	2. FEC 6RGR1	2. FEC 6RGR1
			1. All US-1/ FEC Alternatives				3. FEC 6LRT2
3. FEC 6BRT2/6LRT2	3. FEC 6BRT2/6LRT2	3. FEC 6RGR1				3. FEC 6BRT2/6LRT2	4. FEC 6RRT1
				2. All US-1 Alternatives	2. All US-1 Alternatives		5. US-1 6BRT1
4. All US-1 Alternatives	4. All US-1 Alternatives	4. All US-1 Alternatives				4. US-1 BRT/LRT	6. US-1 6LRT1
SEG 7, 8, 9							
1. FEC Downtown Miami	1. SRRC	1. SFRC	1. FEC Downtown Miami	1. FEC Downtown Miami	1. SFRC	1. FEC MIC	
2. FEC MIC	2. FEC MIC		2. FEC MIC	2. FEC MIC	2. FEC MIC	2. FEC Downtown Miami	
3. SFRC	3. FEC Downtown Miami	2. FEC/Downtown Miami / MIC	3. SFRC	3. SFRC	3. FEC Downtown Miami	3. SFRC	

- **Cost effectiveness** – the extent to which the cost of the alternatives are commensurate with their benefits;
- **Financial feasibility** - the extent that funds required to build and operate the alternatives are likely to be available; and,
- **Equity** – are the costs and benefits of the alternatives distributed fairly across different population groups.

The evaluation matrix in **Table 5.4** includes an alternative's ranking related to the social and environmental impacts, cost, ridership, transportation system impacts and satisfaction in meeting the goals and objectives and purpose and need. For reference purposes, the social and environmental impacts are summarized in their own matrices in **Tables 5.1 – Table 5.3** and detailed in Chapter 3; the

cost information is included in Chapter 2; the ridership and transportation system impacts in Chapter 4; and the purpose and need/goals and objectives in Chapter 1.

Rankings for meeting purpose and need/goals and objectives was from high (1) to low (4). Rankings for impact to the transportation system were also based on a qualitative analysis and ranged from minimal impact (1) to significant impact (4). Rankings for the land use, socio-economic and other NEPA criteria was based on a quantitative analysis as depicted in **Tables 5.1 – Table 5.3**. Due to the large amount of data and number of alternatives, the quantitative analysis utilized a combination of 4 and 5-point ordinal scales to rank and evaluate the build alternatives based on available existing conditions data from the affected environment assessment. The data was compiled from existing conditions taken from a series of GIS layers. An assessment of the numbers and types of social and environmental features (contamination, biological and natural resources, cultural resources, noise and vibration sensitive receptors and superfund sites) present in, adjacent to and/or nearby each of the proposed alternatives for the SFECCTA study area was completed. Alternatives were ranked based on their impact on these features from minimal impact (1) to high impact (4). Rankings established under ridership were based on a comparative analysis of SERPM modeling results for the different service segment alternatives. High ridership contributed to an alternative's high ranking versus low ridership. Rankings for cost were based on a total cost per mile comparison and the lower the cost the higher the alternative ranked.

The initial environmental assessment completed and summarized in **Tables 5.1 -- 5.3** identified the potential **positive** environmental impacts (project benefits) associated with a new premium transit system to be:

- **Air Quality** – reduced emissions from automobiles, trucks and buses due to less highway network congestion and less overall vehicle miles traveled (VMT). Maintaining premium rail freight service on the FEC will also keep additional freight trucks off the highway network.
- **Urban Infill and Densification along and within the coastal communities near transit stations** – positive land use changes/increased land use efficiency that supports Florida's Eastward Ho! Initiative for Southeast Florida including encouraging greater TOD east of I-95 instead of continued urban sprawl and pressures on moving the urban development boundary (UDB). Mixed-use higher-density developments at transit stations within the SFECCTA corridor would be an example of such TOD east of I-95.
- **Economic Development and Redevelopment** – introducing new transit service that complements existing transit systems in established urbanized areas is supportive of CRA's and Empowerment Zone efforts within coastal cities with resulting increased property values near transit stations. Redevelopment of existing designated Brownfield areas and associated urban infill will benefit

disadvantaged communities along the SFECCTA study area. Maintaining and enhancing rail freight service along the FEC improves economic productivity and facilitates international trade.

- **Environmental Justice** – low income and minority populations will benefit from premium transit (within ½ mile of transit stations) with better and/or new connections and access to employment areas, transportation hubs, as well as medical/health care, government/institutional services, educational opportunities, along with recreational and cultural facilities. Large numbers of other transit-dependent populations such as elderly, youth, disabled and minority groups will also be provided transit service. There is also the potential to provide affordable and workforce housing at/near proposed transit stations. It is important to note with regard to Environmental Justice considerations that SFECCTA is evaluating transit services added to existing linear corridor(s), not new alignments through minority or low income communities.

- **Transportation Mobility and Safety** – improved travel times and travel time reliability particularly for north-south travel along the east coast. The addition of a high-capacity, high-speed travel option for a large segment of the population with a significant amount of walk-in/out access within 0.5 mile of proposed transit station locations. The mass transit option is also overall a safer mode of travel than highway travel.

The potential ***negative*** or adverse environmental impacts associated with a new premium transit system ***may*** include the following (to be studied further in Tier 2 segmental projects):

- **Noise and Vibration** – potential increase in the number of rail vehicles using the corridor may increase noise and vibration. However, passenger trains are significantly quieter and shorter than existing freight trains. Upgraded grade crossing devices may be needed to allow for Quiet Zones along the corridor thus eliminating train horns from communities.

- **Community Cohesion** – additional north-south transit service may potentially require new protective fencing along the right-of-way, especially for greenway or trail provisions along FEC Railway or adjacent roadways. The potential for fencing, along with additional temporary roadway closures, could increase the existing barrier effect in communities within the SFECCTA study area. However, there is also the potential for including a continuous north-south greenway that could simultaneously enhance community cohesion, thereby potentially mitigating some of the barrier effect.

- **Local Traffic** – additional temporary roadway closures at grade crossings which will be mitigated with some new grade separations. Additional impacts to local traffic would be associated with building a new Regional Rail alignment along I-95 in Service Segment

- **Cultural Resources** – Adjacent historic structures, districts or neighborhoods as well as archaeological sites, districts or zones could be impacted.

- **Visual/Aesthetics** – new transit service vehicles and new buildings at stations and O&M sites would be the most visible introductions to the viewscape. Some elevated transit options for certain segments that are under study would be the most dramatic viewscape changes along the alignment routes themselves, as additional rails at-grade are not highly visible.

- **Contamination Sites** – potential for impacts primarily at station areas, O&M sites and at east-west connection locations.

- **Relocations/Displacements** – potential commercial property impacts at station areas, O&M sites and east-west connection areas. Commercial property impacts were most discernable along the US-1 alignments where additional right-of-way would be necessary for a dedicated premium transit service. Residential property impacts were most discernable along the I-95 corridor in Service Segment 1 where a new Regional Rail facility following this alignment would displace adjacent residential areas.

- **Canal and Waterway Crossings** – including wetlands, EFH, manatee critical habitat, navigation (commercial and personal watercraft concerns), special designations (Aquatic Preserves), water quality, and visual (changes to view shed) may be impacted.

When reviewing the summary of alternatives evaluation matrix **(Table 5.4)**, and the documentation provided in the chapters that support the matrix, the following conclusions were drawn:

- All FEC alignment alternatives best met the project Purpose and Need.

- The FEC alignment alternatives best met the project Goals and Objectives in all service segments but Service Segment 1, where the RGB alternatives on I-95 (1RGB1 and 1RGB1A) were the best fit.

- All of the BRT and LRT alternatives on the FEC alignment, the RRT alternatives in service segments 5 and 6 (5RRT1 and 6RRT1) and the RGB alternatives on I-95 (1RGB1 and 1RGB1A) had the least negative impact on the existing transportation system.

- The FEC alignment alternatives ranked highest in terms of accessibility to transit-dependent populations except in Service Segment 1 where US-1 ranked highest.

- All of the US-1 alternatives ranked lowest in terms of meeting NEPA criteria due to the number of displacements of the businesses along the corridor. In order to provide dedicated premium service along US-1 alignment, the economic and social impact was deemed unacceptable. Estimates of potential right-of-way costs associated with these displacements were included in Chapter 2. The FEC alternatives had the least adverse impacts to the NEPA related criteria except in Service Segment 1.

- The RGR alternative on I-95 (1RGR2) in Service Segment 1 also ranked low in meeting NEPA criteria due to the potential residential displacement for a new rail alignment. Right-of-way costs associated with these displacements were included in Chapter 2.

- The RGR alternative on I-95 in Service Segment 1 (1RGR2) also had the lowest ridership of all alternatives.
- The FEC alternatives in Service Segments 2 through 6 had three times the ridership potential than comparable alternatives on US-1.
- The BRT and LRT on US-1 are consistently the most expensive alternatives.
- RRT in Service Segment 5 (5RRT1) and RGR on I-95 (1RGR2) are the next most expensive alternatives, although the former also attracts significant ridership where the latter does not.

Based on this evaluation, Tier 1 recommendations will include the elimination of all US-1 alignment alternatives and the RGR alternative on I-95 (1RGR2). Due to the environmental impacts, such as direct displacements of businesses and residential areas, low ridership and very high costs, these alternatives will not be considered for further evaluation in Tier 2.

5.1.3. Preliminary Evaluation of Operations & Maintenance Facilities

As discussed in Chapter 2.0, given the extent of the SFECC study area, there will likely be at least one central O&M facility required for each modal technology ultimately selected, varying in scale and scope with the complexity of the choice. At a minimum, given the current design of SFECC service segments and dependent upon ultimate decisions regarding the extent of service segments, satellite facilities will likely be needed in the vicinity of:

- Tequesta/Jupiter
- West Palm Beach
- Pompano Beach
- Hollywood/Hallandale
- Downtown Miami

Eight potential sites were preliminarily evaluated based on the needs discussed above. A Preliminary GIS analysis in Tier 1 was conducted to screen the initial environmental issues associated with each segment O&M facilities may be located within. **Table 5.5** provides an evaluation of the potential O&M sites for their impacts on known environmental resources. **Figures 2.18** – **Figure 2.21** illustrate the service segments with generalized “preferred maintenance facility areas” identified. Since no specific sites are being recommended at this time in Tier 1 a detailed analysis cannot be completed. O&M facility needs and location will be further evaluated in the Tier 2 segmental studies. O&M sites locations will not be determined until Tier 2 studies have resulted in an implementation plan, including project scheduling.

5.1.4. Irreversible and Irretrievable Commitments of Resources

Because there are many alternative alignments still under consideration as part of the Tier 1 analysis, it is not yet conclusively known whether there will be any irreversible and irretrievable commitments of resources. However, these issues will be identified and evaluated as appropriate during the Tier 2 studies.

5.2. Evaluation of Alternatives Conclusions

As outlined in this chapter, the evaluation of alternatives was done for Tier 1 as a preliminary screening based upon both a qualitative (more subjective) and quantitative (number based) assessment (see Section 5.1.1). The results of this screening of the alternatives are summarily presented in **Table 5.4** in a manner that ranks alternatives by how well they comply with the FTA criteria of Effectiveness, Impacts, Cost Effectiveness, Financial Feasibility, and Equity, (Section 5.1.2). These qualitative and quantitative assessments are based on extensive data collection and analysis with GIS, traffic modeling, financial forecasting tools, and utilizing sound engineering, environmental and planning judgment or protocols, as outlined in Chapters 1.0 through 5.0 of this DPEIS.

The FEC alignment alternatives best met the overall project Purpose and Need as well as the project Goals and Objectives (except for RGB on I-95 as a bus extension of Tri-Rail from West Palm Beach to Jupiter in Service Segment 1, the shortest alternative, which ranked highest for Goals and Objectives). The FEC Railway also resulted in the least negative impacts on the existing transportation system while ranking highest in terms of accessibility to transit-dependent populations, with the exception of Service Segment 1 (US-1 alternatives do best in that short Service Segment). FEC alternatives also had three times the ridership potential comparable to US-1 alternatives. Therefore, FEC alternatives (and I-95 for RGB as bus extension of Tri-Rail to Jupiter) are recommended for further evaluation in Tier 2, and US-1 alternatives are not to be considered for further evaluation.

Table 5.5: Preliminary Evaluation for Operations & Maintenance (O&M) Facilities Alternatives

Operations & Maintenance Facilities	O&M Facility H	O&M Facility G	O&M Facility F	O&M Facility A	O&M Facility B	O&M Facility C	O&M Facility D	O&M Facility E
Shapefile Name								
Aquatic Preserves	0	0	0	0	0	0	0	0
Brownfield Site Boundaries	0	0	0	0	0	0	0	0
Brownfield Locations	0	0	0	0	0	0	0	0
City Parks (Miami-Dade)	0	0	0	0	0	0	0	0
City Parks(Broward)	0	0	0	0	0	0	0	0
City Parks (Palm Beach)	0	0	0	0	0	0	0	0
Coastal Barrier Resources	0	0	0	0	0	0	0	0
Conservation and Recreation	Jonathan Dickinson State Park	0	0	0	0	0	0	0
County Operated Parks (Palm Beach)	0	0	0	0	0	0	0	0
County Operated Parks (Broward)	0	0	0	0	0	0	0	0
County Operated Parks (Miami-Dade)	0	0	0	0	0	0	0	0
Environmentally Sensitive Shorelines	0	0	0	0	0	0	0	0
EPA Toxic Release Inventory	0	0	0	0	0	0	0	0
FDEP Restoration Inventory	0	0	0	0	0	0	0	0
Flood Zones (Martin, 9643)	X, X-500	0	0	0	0	0	0	0
Flood Zones (Palm Beach, 9650)	0	X	X, X-500	0	0	0	0	0
Flood Zones (Broward, 9606)	0	0	0	AH	X, AH	AH	AE	X, AE
FL Land Management Areas	Jonathan Dickinson State Park	0	Hypoluxo Scrub Natural Area	0	Pompano Airpark	0	0	0
FL State parks	Jonathan Dickinson State Park	0	0	0	0	0	0	0
Forest Inventory Analysis	0	0	0	0	0	0	0	0
Greenways: Cultural and Historic Features	0	0	0	0	0	0	0	0
Groundwater Contamination Areas	0	0	0	0	0	0	0	0
HAZMAT Sites	0	0	0	0	0	0	0	0
Major Rivers	0	0	0	0	0	0	0	0
Manatee Protection Zones	0	0	0	0	0	0	0	0
Mangrove Habitat	0	0	0	0	0	0	0	0

Operations & Maintenance Facilities	O&M Facility H	O&M Facility G	O&M Facility F	O&M Facility A	O&M Facility B	O&M Facility C	O&M Facility D	O&M Facility E
National Wetland Inventory 43 (Martin)	Upland, PEM1A	0	0	0	0	0	0	0
National Wetland Inventory 50 (Palm Beach)	0	Upland	Upland	0	0	0	0	0
National Wetland Inventory 06 (Broward)	0	0	0	Upland	Upland	Upland	Upland, PUBHx	Upland
Navigable Waterways	0	0	0	0	0	0	0	0
Superfund/National Priority List Site Boundaries	0	0	0	0	0	0	0	0
Outstanding FL Waters	Jonathan Dickinson State Park	0	0	0	0	0	0	0
Public Lands	Jonathan Dickinson State Park	0	Hypoluxo Scrub Natural Area	0	Pompano Airpark	0	0	0
Scripps Biomedical Research Park	0	0	0	0	0	0	0	0
Seagrass Beds	0	0	0	0	0	0	0	0
SFWMD Canals	0	0	0	0	0	0	0	0
Special Drainage District	0	0		Broward County WCD#3		Broward County WCD#3	0	0
Strategic Habitat and Conservation Areas	0	0	0	0	0	0	0	0
Superfund Sites	0	0	0	0	0	0	0	0
Underground Petroleum Tanks	0	West Palm Beach City Lift Station #21	0	0	Driscoll Towing	OK Service Center, Inc., Shell-JD;s	0	Lauderhill City Utility Dept.

Note: The maintenance facilities are arranged from north to south beginning with *H* in Martin County. Facilities *G* and *F* are in Palm Beach Co. and facilities *A, B, C, D* and *E* are in Broward County. The evaluations were conducted for a 20 acre area centered on the potential facility locations.

The US-1 alternatives are ranked lower overall than the FEC Railway options for several reasons. Considering costs and relocations or displacements, two US-1 alternatives, BRT and LRT, are consistently and significantly the most expensive of the alternatives. The costs are higher along all of the US-1 alternatives both with and without right-of-way costs as outlined in Chapter 5, due to the highly developed nature of the corridor, the amount of new railway ballast or roadbed (for new exclusive busway or railway right-of-way on one or both sides of the roadway, possibly for in-street trackbed construction), as compared to the relatively clear and prepared FEC Railway right-of-way. Compared to US-1, the FEC Railway corridor is already virtually “cleared and grubbed”, that is, ready for initial construction, whereas US-1 alternatives would need lengthy and costly demolition, including contamination cleanup (remediation), prior to initial construction.

Maintenance of traffic (MOT) costs are also anticipated to be much higher on US-1 compared to the FEC Railway alignment. To build an exclusive lane for transit along US-1 would greatly impact the heavy flow of vehicle traffic while MOT for potential construction along the existing FEC right-of-way would be less costly and would have much less impact to vehicular traffic as well as to the existing freight traffic. The impacts to existing communities are also potentially greater along the US-1 alternatives than the FEC alternatives from a social and economic perspective. For example, the potential for relocations and displacements, while not possible to quantify precisely in the Tier 1 screening level of assessment, are orders of magnitude greater for US-1 alternatives (several thousands of parcels) due to the limited available public right-of-way bordered by highly developed adjacent land uses. These displacements could entail substantial Environmental Justice issues due to minority and/or low income communities identified along the corridor and economic displacement within them. The economic impact of relocating the many existing businesses along the US-1 corridor would be significant. In contrast, the potential for these types of displacements and relocations are less along the FEC alternatives due to the existence of available right-of-way. As discussed previously in the document, these extra costs and potential relocations/displacements along US-1 would be incurred in order to gain only 1/3 the ridership potential that the FEC Railway is modeled to produce.

Finally, as depicted in **Tables 5.1 – Table 5.3**, the environmental criteria (following federal NEPA guidelines) for which US-1 alternatives ranked low (due to higher numbers of sites or issues that could be impacted or involved) included contamination where US-1 alternatives had the highest number of sites for each Service Segment. US-1 alternatives also ranked lowest for NEPA compliance due to greatest potential to impact cultural resources as well as ground-borne noise and vibration sensitive receptors for five of the six Service Segments. Biological and natural resources were also most prevalent along the US-1 alternatives in four of the six Service Segments and therefore the potential for negative impacts to these with a transit alternative along US-1 would be greater than along the FEC Railway alternatives.

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6.1. Introduction

The tiered environmental process supports decision-making on issues that are ripe for decision and provides a means to preserve those decisions (40 CFR 1502.20). Tiering breaks down the decision-making process into two steps with the broad regional issues and alternatives being grouped together and addressed in the first tier document, followed by more specific issues grouped and addressed in the second tier documents. The Tiered EIS process actually allows the agency to determine with certainty the level of effect from the agencies and public early on so that only the necessary level of environmental analysis is performed in Tier 2 EIS's, or possibly Environmental Assessments (EA's) and Categorical Exclusion Type 2 (CE-II) for individual segments. The environmental tiering process allows for earlier identification and clarification of potential environmental impacts, especially focusing on indirect and cumulative effects, and of subsequent processes for addressing potential adverse impacts in Tier 2. It also avoids segmentation concerns that can arise when large projects are developed in a series of related but separate studies.

6.2. Decisions to be made during the Tier 1 DPEIS Phase

6.2.1. Agreement on Viable Options to move forward for Further Analysis in Tier 2

The viable options include 21 combinations of service segment, alignment and technology (see **Table 6.1**) and are overall represented as follows:

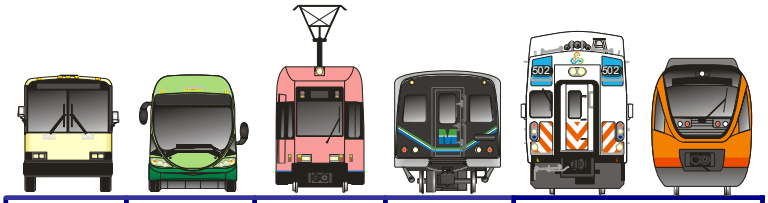
- BRT along portions or all of the FEC alignment
- LRT along portions or all of the FEC alignment
- RGR along portions or all of the FEC alignment
- RRT along portions or all of the FEC alignment south of Pompano Beach
- RGB along the I-95 alignment in North Palm Beach as a possible rubber-tired extension of Tri-Rail
- Segment 1 and 2 North end connections: Option 2C- canal C-17 frontage, Option 3B- FP&L alignment at Riviera Beach, Option 5A- Waterworks connection
- TSM improvements (including Tri-Rail and local bus improvements)

6.2.2. Agreement on the Non-Viable Options that will not proceed to Tier 2 Analysis

These non-viable options consist of:

- All the US-1 alignment alternatives, which are significantly more expensive, are less productive in terms of ridership, and generate more negative environmental impacts than their counterparts using the FEC alignment.

Table 6.1: Alternatives Recommended for Tier 2



Service Segment	Alignment	Regional Bus	Bus Rapid Transit	Light Rail Transit	Rail Rapid Transit	Regional Rail	
						Tri-Rail	Other RGR
1 West Palm Beach North	FEC		■	■		■	
	US1						
	I-95	■					
2 North Palm Beach County	FEC		■	■			■
	US1						
3 West Palm Beach South	FEC		■	■			■
	US1						
4 East Broward County	FEC		■	■			■
	US1						
5 Ft Lauderdale – Miami	FEC		■	■	■		■
	US1						
6 Miami Northeast	FEC		■	■	■		■
	US1						
	Technology:	RGB	BRT	LRT	RRT	RGR	

- The I-95 Regional Rail alternative along Service Segment 1, which is the most costly alternative in terms of cost per mile, is the least productive alternative in terms of ridership, and has significant negative environmental impacts. Use of the I-95 alignment for alternatives south of West Palm Beach was eliminated due to the minimal number of attractors within reasonable walking distance of the I-95/Tri-Rail alignment (see **Figure 2.4** in Chapter 2). Moreover, given the presence of Tri-Rail immediately adjacent to I-95 south of West Palm Beach, alternatives involving the I-95 alignment are effectively included in the No-Build and TSM alternatives.

- Any service north of Jupiter since the Tequesta station generates little ridership and a reliable corridor service across the Loxahatchee River would require an expensive high-level crossing. Connections between the Tequesta community and the rest of the corridor using feeder bus service will be further considered, however, in Tier 2.

- Segment 1 and 2 North end connection options: 1, 2A, 2B, 3A, 3C, 4A, 4B, 5B, 5C and 6.

- Technologies including HSF, Electric Bus/Streetcar, Guided Bus/Rapid Guided Bus, Intercity Motor Coach, AGT (e.g. Peoplemover), Monorail, RTR, or HSR (Maglev, electric, or other)

6.2.3. Agreement on further Study in Tier 2

Agreement on further study in Tier 2 of the:

- **Development of a proactive strategy:** To reduce the number and/or community impacts and enhance the safety of at-grade highway crossings of the FEC alignment.

- **Preliminary station locations including park-and-ride locations:** To avoid overburdening other stations in Jupiter and Palm Beach Gardens with intra-regional trips originating north of the study area (Martin and St. Lucie Counties), a significant park-and-ride facility is particularly recommended in the vicinity of PGA Boulevard due to that locations superior access to I-95 and Florida's Turnpike. As indicated in Chapter 2, the land uses surrounding Jupiter and Palm Beach Gardens are more residential and the public process supported minimal parking for external origin trips at these proposed station locations.

- **Preliminary O&M facility locations:** These could still possibly include locations north of Jupiter that would not require a high-level crossing of the Loxahatchee River.

- **Agreement on the logical limits and relative priorities for segments moving forward for further individual analysis in Tier 2:** These limits refer to study limits and not necessarily to implementation phasing. The recommendations are based on the analysis of forecasted travel patterns of the six service segments considered in Tier 1 which were subdivided and reconsolidated. Three subcorridor segments and one corridor-length segment were identified reflecting forecasted travel patterns and markets, listed in priority order and illustrated in **Figure 6.1**.

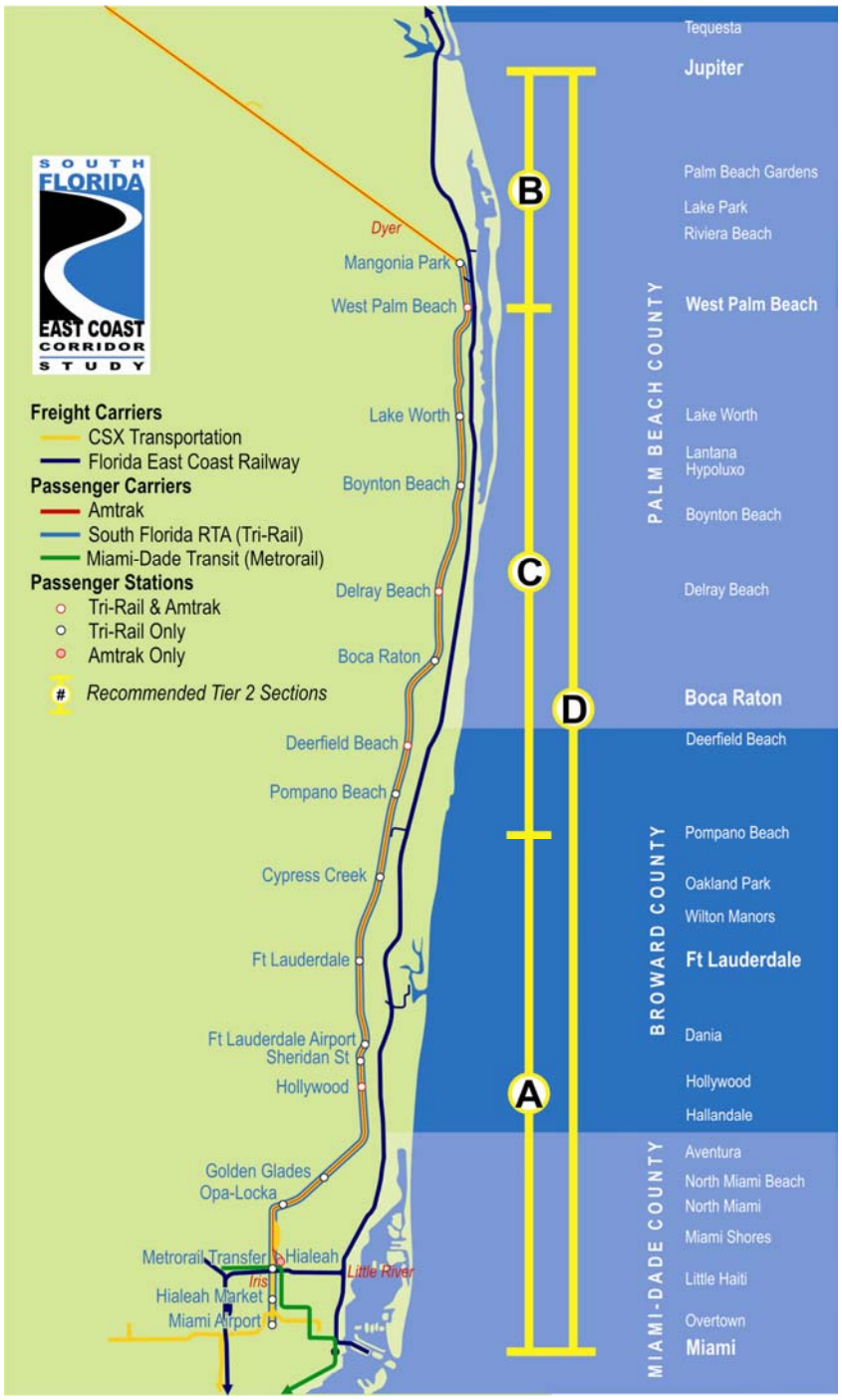
  - **South Corridor Segment:** Extending north from Miami Government Center through Fort Lauderdale to an interchange station with Tri-Rail in the vicinity of the Pompano Beach Station via the FEC alignment (encompassing Service Segments 4, 5, and 6).

  - **North Corridor Segment:** Extending north from an interchange with Tri-Rail at West Palm Beach Station to Jupiter either via Mangonia Park Station (Service Segment 1) or via the Warterfront Connection/Banyan Boulevard to the FEC alignment in West Palm Beach (the northern portion of Service Segment 2).

  - **Central Corridor Segment:** Extending between West Palm Beach Station and an interchange with Tri-Rail in the vicinity of Pompano Beach Station via the FEC alignment (the southern portion of Service Segment 2 and Service Segment 3).

- **South East Florida Corridor Segment:** Extending the entire length of the corridor and overlaying the South, Central and North Corridor Segments, this "segment" addresses inter-segment travel issues and coordination as well as overarching corridor issues common to all segments (e.g.: Amtrak and freight operations, design standards, express and premium longer-distance travel markets).

Figure 6.1: Recommended Tier 2 Study Segments



6.2.4. Decisions Anticipated to be made during the Tier 2 Phase

- Environmental Determinations (Class of Action Determination) at the beginning of Tier 2, resulting most likely in :
  - Tier 2 EIS's, Environmental Assessments, Categorical Exclusions – Type 2, supported by information provided in Tier 1.
- Agreement on a locally preferred alternative (LPA) per corridor segment. Each LPA will consist of:
  - A combination of an alignment and technology
  - Final station location sites
  - Final O&M facility location sites
- Agreement on a methodology for addressing potentially historic linear resources, based upon:
  - Continued coordination with the Florida SHPO regarding the types of improvements associated with the transit service and how they may affect historic resources.
  - Development of a protocol by FDOT and FHWA for identification, documentation, and evaluation of such linear historic resources as the FEC Railway, US-1, Dixie Highway, Miami Canal and other major canals related to the Everglades Drainage District.

6.3. Potential Corridors on New Location

No potential corridors along entirely new locations or alignments have been identified in Tier 1 of the SFECCTA study area. Several partial corridors on new locations have been identified that are potential connections along canal banks or utility rights-of-way that extend between existing rail or roadway alignments for Service Segment 1. These alternatives (considered variations on alternatives for modeling comparative scenarios), should they be carried forward from the final Tier 1 alternatives selection process into Tier 2, will be examined in closer detail during the independent Tier 2 NEPA segmental studies.

6.4. Cumulative and Secondary Impacts

As described in Chapter 3.0, Affected Environment and Environmental Consequences, consideration of environmental consequences includes evaluation of the potential direct effects from the proposed project that may have either a negative or beneficial impact on the environment. In addition, this study identifies the environmental consequences that are not clearly known and which will need further evaluation/assessment in Tier 2. Assessment of other requirements under NEPA such as secondary (i.e., indirect) and cumulative effects, construction impacts, and mitigation for unavoidable, already minimized

impacts are addressed to the level possible in Tier 1. However, most evaluation of construction impacts and mitigation will necessarily have to be deferred until Tier 2. A screening approach has been determined to be appropriate in Tier 1 since a large number of alternatives are still being considered for segments of the corridor as well as the entire 85 mile corridor as a whole. Therefore, the individual direct or indirect (i.e., secondary) and/or cumulative effects of each alternative on environmental resources will be evaluated in Tier 2.

Below is a synopsis of potential secondary and cumulative impacts that may result from implementation of transit service along the corridor.

6.4.1. Neighborhoods and Communities

- Secondary and cumulative (indirect) economic effects are anticipated to follow the current redevelopment trends along the eastern spine of the Tri-County area. Therefore, federal guidance on Environmental Justice (EO 12898 and DOT Order 5610.2) will be followed to comply with the expanded protection for minority and low-income populations, ensuring that disproportionate impacts on low-income and minority populations are avoided, if practicable, unless avoiding such disproportionate impacts would result in significant adverse impacts on other important social, economic, or environmental resources. Tier 2 should further address the Tier 1 assessment that there is potential for cumulative impacts in the form of continued displacements of existing uses as a result of redevelopment that may be accelerated with additional transit in the corridor. However, Tier 2 analyses are anticipated to identify where there will also be increased opportunities for workforce housing, affordable housing and mixed income communities with the availability of premium transit as compared to present conditions in these communities.

- Numerous and widespread positive effects on community cohesion are anticipated as a result of improving transit services within the communities served by the SFECCTA. These include, but are certainly not limited to, opening up new inter-community and improving intra-community access with provision of new station locations as well as affordable and reliable premium transit services. In addition, the improvements in access to jobs, social/government services, recreation opportunities, etc., especially to the disproportionate numbers of transit-dependent populations residing in the study area, would be a far reaching enhancement of community cohesion resulting from new transit services in the SFECCTA study corridor. However, there may also be adverse effects on street traffic when railway crossings are closed more often to accommodate passing transit service. More frequent train service will mean more gate closings, although passenger trains are shorter and faster than freight trains so their impact on traffic is less severe. Tier 2 studies will analyze the need to raise either the roadway or the tracks, or close crossings altogether wherever practical, in order to minimize delays to auto traffic. FDOT will work closely with each municipality along the FEC alignment and these issues will be studied in greater detail in Tier 2 as part of a program of RR crossings evaluations. In addition,

the placement of noise barrier walls and/or fences along the corridor may have both a beneficial effect with regards to noise abatement and a negative indirect effect to community cohesion.

6.4.2. Land Use, Zoning, and Economic Development

- Secondary and cumulative effects on land use within the study area may be both beneficial and adverse, particularly in relation to station locations, types of stations and parking amenities, traffic patterns, and joint development opportunities, including but not limited to TOD with or without affordable/workforce housing units. The location of O&M facility or facilities may also have effects that can be beneficial and/or adverse depending on the existing or planned land uses in locations being considered.

- There are likely to be secondary and cumulative effects with respect to zoning in anticipation of the SFECCTA as adjacent municipalities consider the benefits of premium transit service, especially with transit stations, within their boundaries. Zoning changes could positively impact the adjacent corridors and revitalize single use neighborhoods. However, these re-zonings may have a negative impact on existing communities due to increased property values, increased rents and home ownership affordability.

- Joint development opportunities will likely arise as a result of a transit corridor and associated station areas. Moreover, expansion of transit with any of the alternatives developed can provide mobility for greater job access in the region. Therefore, the economic conditions of the study area would benefit overall from the expansion of transit service.

- Secondary and cumulative effects regarding land acquisition may be anticipated in that local governments in the study area are currently buying property within the study area to facilitate redevelopment opportunities. As part of this study, information was collected regarding public lands owned within the study area. During Tier 2, these parcels would be targeted for any potential station area opportunities. The FDOT would work with the local governments and communities, once a preferred alternative is selected in Tier 2, to identify opportunities for land acquisition that would have minimal impact on established residential neighborhoods.

- Any of the alternatives under consideration will continue to support the redevelopment efforts currently being undertaken by the local governments adjacent to the FEC Railway corridor. The impact of the alternatives will be to accelerate the market conditions that are already happening in the South Florida area with respect to redevelopment. This is a regional benefit in that it supports the urban infill and redevelopment goals in the Eastward Ho! Study for the eastern portions of the Tri-County Area. Although in general redevelopment increases tax base and provides new opportunities for jobs and housing, sensitivity to existing neighborhoods in the area will need to be included in Tier 2 NEPA studies, particularly with respect to Environmental Justice.

- Displacement and relocation of existing land uses appears to be happening already along the corridor, however, passenger service along the FEC Railway may accelerate these developing plans. There are several scenarios regarding displacements and relocation of tenants (commercial or residential) that may be anticipated as a result of providing premium transit services in the SFECCTA corridor. These include direct displacements/relocations resulting from the alternative of extending Tri-Rail up I-95 in northern Palm Beach County, a worst case scenario of new rail construction outside the FDOT right-of-way with displacement and relocation of residents for new elevated rail transit. This would also impact the next rows of adjacent residences to the noise and visual viewscape changes above and beyond current conditions. Direct displacements are also a potential along the US-1 alternatives particularly to existing businesses. Direct displacements or relocations may also be resulting from station locations, O&M facility locations and in areas of substandard FEC Railway right-of-way locations (less than 100 feet width). Indirect displacements/relocations may be anticipated due to increased rental prices, increased property values and associated home ownership costs, and from intensified developer activity (the latter involves converting existing land uses to redeveloped properties at higher market values than the current population may be able to afford or even desire). These indirect displacement/relocation issues can be described as induced relocation, and would necessarily be an important component of socio-cultural effects assessments in the independent Tier 2 segmental NEPA studies.

In addition to potential secondary and cumulative impacts to neighborhoods and communities addressed above, due to the large size of the study area there are potential impacts to the following cultural and natural features that are present within the SFECCTA study area and described in more detail in the environmental consequences sections of Chapter 3.0:

- Historic and archeological resources.
- Parkland and recreational areas (including pedestrian and bicycle facilities).
- Biological resources and other natural resources.
- Air quality.
- Aesthetics and the visual qualities (effects on the community viewshed).
- Noise and ground-borne noise and vibration.
- Contamination and hazardous materials
- Navigation and other impact areas such RR crossing safety.

Each of these environmental effects are detailed and analyzed for the purposes of Tier 1 screening of alternatives. This screening approach is outlined in Chapter 3.0 and determined as most appropriate in Tier 1 since a large number of alternatives are still being considered for segments of the corridor as well as the entire 85 mile SFECCTA corridor as a whole. Therefore, the individual and/or cumulative effects of each alternative on environmental resources cannot be precisely detailed at this point. However, summary tables of the potential for impacts to these resources (based on GIS screening analysis of presence along the SFECCTA alignments) have been developed for use in the Tier 1 screening process (see Chapter 5.0) and as baseline data (much of it GIS based) for more detailed Tier 2 analyses (see Chapter 3.0 and Appendix A).

6.5. Possible Purchase of Right-of-Way Parcels, Track Right-of-Way

Consistent with the decisions made in Tier 1, only the FEC alternatives and the I-95 Regional Bus alternative in service segment one (1) should be carried forward into Tier 2. Therefore, the following discussion focuses on the potential Right-of-way acquisition that may occur during Tier 1 which at a minimum can include one or more of the following:

- FEC railroad right-of-way that contains the FEC railway
- Other FEC industries properties located adjacent to or near the FEC railroad alignment
- East-west railway connections between FEC and SFRC/CSXT
- East-west contiguous property such as utility corridors or canal rights-of-way
- Initial transit station locations or portions thereof
- East-west roadway property at potential grade separations
- Viable O&M facility sites or portions thereof

These right-of-way acquisition opportunities will be pursued by FDOT with FEC Industries, local municipalities and any others as the opportunities arise in Tier 1 and more aggressively in Tier 2 during independent segmental studies.

Land uses along the corridor study area range from low to high density residential, industrial and commercial development. Significant redevelopment activity is occurring along the corridor which dramatically changes development patterns and residential density. Recent legislation pertaining to the actions of the CRA and the use of eminent domain may result in a slowdown in current redevelopment efforts.

The FEC Railway is generally a 100 foot wide corridor along the entire 85 miles and is currently held in private ownership. To develop transit alternatives within the existing corridor, the FDOT must acquire enough property interests to provide significant control over the corridor in order to enable continuous and uninterrupted service for commuter transit operations. These interests can range from the purchase of the entire corridor in fee simple to the purchase of easements sufficient enough to protect the needs of the FDOT and other transit agencies. Purchasing in fee simple would necessitate easements reserved to FEC Railway for continued freight usage.

Current market conditions in South Florida indicate a leveling off or a reduction in property values. This trend follows a period of time in which South Florida experienced significant market appreciation. However, given the current, continued and projected growth rates for South Florida, residential units will continue to be in high demand regardless of market price fluctuations. Demand will also increase around station locations as there is an indication local municipalities are currently evaluating land uses along the corridor with the implementation of TOD designations.

Along the main line corridor, land acquisition may not be necessary for operations of the transit rail lines because the 100 foot corridor can accommodate up to six (6) tracks for both freight and commuter rail. However, there may be some areas of the corridor where the 100 feet does not exist and would have to be purchased for passenger operations. The only other areas in which right-of-way acquisition will be necessary will be for maintenance facilities/yards, station locations and transit alignments and/or transit connections between the FEC Railway and the SFRC/CSXT on which the Tri-Rail currently operates, as well as other transit systems. Should any alternative include transit lines along or through US-1 or Dixie Highway, the resulting right-of-way impacts including land, business damages, relocation and other associated costs will be significantly higher than utilizing the existing FEC Railway corridor.

Land acquisition programs will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, and in Rule Chapter 14.75, Florida Administrative Code (FAC), specifically Rule 14.75.003. Relocation programs will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, Rule Chapter 14.66 (Part III), and the FAC (specifically Rule 14.75.003). Relocation resources are available to all residential and business relocatees without discrimination. The FDOT enforces Title VI and VIII of the Civil Rights Act of 1968, and amendments, making discriminatory practices in the purchase or rental of housing illegal if based on race, religion, sex, or national origin.

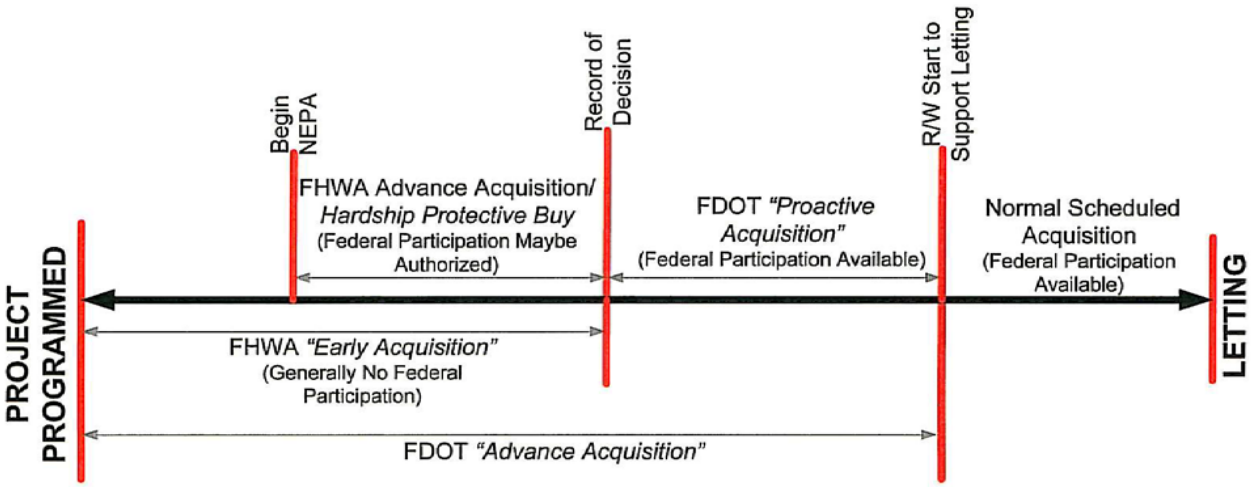
As part of the overall Right-of-Way Acquisition Program, serious consideration should be given to advance acquisition programs allowed under Title 23 CFR, Section 710.501 and Section 710.503; FS Section 337.243 and Section 337.273 and FDOT Right of Way Manual Section 8.1.

6.5.1. Acquisition

The FDOT Right-of-Way Procedures manual describes advance acquisition programs as follows:

- **Advance Acquisition -** The term is used to describe right-of-way acquisition occurring prior to the year in which right-of-way acquisition is programmed/scheduled. This term is used to describe federally assisted hardship acquisitions and protective buying occurring during the NEPA process (**Figure 6.2**).

Figure 6.2: Advance Acquisition



- **Early Acquisition:** The term is used to describe right-of-way acquisition, other than hardship acquisition or protective buying, occurring prior to completion of the NEPA process (**Figure 6.2**).

- **Hardship Acquisition:** The term is used to describe federally assisted acquisition of a particular parcel or limited number of parcels occurring during the NEPA process to address health, safety or financial hardships experienced by a landowner as a result of an impending project (**Figure 6.2**).

- **Proactive Acquisition:** The term is used to describe right-of-way acquisition occurring after completion of the NEPA process but prior to the year in which right-of-way acquisition is programmed/scheduled (**Figure 6.2**).

- **Protective Buying:** The term is used to describe federally assisted acquisition of a particular parcel or limited number of parcels during the NEPA process to prevent imminent development that would substantially increase costs or limit future transportation alternatives (**Figure 6.3**). For example, this could entail buying a piece of vacant property prior to it being developed and becoming more costly after it has been developed.

Further, the ability to purchase railroad right-of-way before completing Tier 1 may be considered by the FTA under Section 3024 of SAFETEALU)-LU, amended 49 USC 5324, as a "separate action" from NEPA

for preservation of railroad corridor for pending transit projects ("Corridor Preservation"). However, the ability to purchase non-railroad right-of-way even after completing Tier 1 will be limited. The Tier 1 phase will examine which, if any, individual parcels can be purchased or otherwise preserved for future transportation improvements. A Tier I DPEIS, once reviewed, does not in itself necessarily lead to pre-award authority to acquire right-of-way. In a Federal Register notice published on November 30, 2005, outlining changes resulting from the SAFETEA-LU, it states "When a tiered environmental review in accordance with 23 CFR 771.111(g) is being used, pre-award authority is NOT provided upon completion of the first-tier environmental document except when the Tier-1 ROD or FONSI signed by FTA explicitly provides such pre-award authority for a particular identified acquisition."[6]

Consequently, FTA will need to explicitly state in the ROD that pre-award authority is granted for right-of-way purchases for those parcels FTA determines have been adequately identified and evaluated in the DPEIS. FDOT may then purchase these parcels with the guarantee that they will be eligible as match towards a future federal project. However, it is further anticipated that FDOT cannot actually use the parcels for a project until the Tier 2 NEPA document is completed. For example, FDOT may purchase a parcel of land adjacent to or in the SFECC study area after receipt of the Tier 1 ROD and decide that the land could be used for a park-and-ride lot in advance of the New Starts project coming on-line. In this hypothetical case, FDOT would need to prepare a Tier 2 NEPA document (CE, EA/FONSI or EIS/ROD, as appropriate) before proceeding with the interim project. Examples of how advance acquisition of non-railroad right-of-way may be used would include the following:

- maintenance and operating facility sites;
- transit alignments (off FEC Railway) and/or transit connections (e.g. to Tri-Rail or Metrorail) through non-railroad private property; and
- transit terminals/station areas

Advance acquisition policies would be immediately effective when considering the need for maintenance facilities and yards to support overnight storage, running repairs, heavy repair and central maintenance. Ideal locations would be currently vacant or abandoned industrial properties within compatible land uses. Secondarily, advance acquisition programs should be instituted once the identification of right of way needs have been determined for the transit alignments and/or transit connections between FEC Railway and Tri-Rail.

At this time, sixty one (61) initial station areas have been identified for preliminary assessment in Tier 1. Through advance acquisition opportunities and surplus property owned by the FDOT in excess of the

[6] http://www.fta.dot.gov/legal/federal_register/2004/16290_17929_ENG_HTML.htm, page 71976

main line corridor requirements, opportunities exist in further developing the FEC Railway into a viable transit corridor by means of making Joint Public/Private Development of right of way available to developers interested in creating transit station hubs. Joint Public/Private Development of right of way is authorized under Title 23 CFR, 710 Subpart D; Rule Chapter 14-109, FAC and FS 337.251. Given proper approval and authority, Joint Development presents an opportunity for the FDOT to generate an income stream while also gaining needed amenities such as parking and office space within the Joint Developments. Additional income opportunities exist within the corridor by continuing to lease or originate lease opportunities for fiber optics, telecommunications, natural gas lines, outdoor advertising and other income generating sources.

The acquisition of land for public purpose projects is almost always accomplished under local and state eminent domain law, regulations and procedures. These laws and regulations generally require the public agency to obtain one or more appraisals, to negotiate with the landowner in good faith, and to offer the landowner a fair and reasonable price for the land. The owner usually has the right to obtain his/her own appraisal, legal counsel and expert advisors; and if not satisfied with the results of the negotiation, to take the case to court, where through mediation, settlement, or jury verdict a final value is determined. Florida eminent domain law and regulations are similar to some states across the nation but differ in that they require the public agency to reimburse the landowner all reasonable costs incurred by the landowner in presenting his/her case throughout the process including litigation.

Where relocation is required, relocatees will be eligible for:

- **Owner Replacement Housing:** The costs that the owner incurs associated with purchasing or renting of a replacement site (i.e.: purchase additives).
- **Tenant Replacement Housing:** The costs that the tenant incurs associated with renting or purchasing of a replacement site (i.e.: rental supplements).
- **Residential Move Cost:** The moving costs associated with relocating a residential dwelling unit to the replacement site (i.e.: moving company, self move, utility reconnections, etc.).
- **Business/Farm Move Cost:** The moving costs associated with relocating a business to the replacement site (i.e.: moving company, self move, re-establishment, etc.).
- **Personal Property:** The costs to move personal property to the remainder property (i.e.: moving company, self move, etc.).
- **Signs:** The cost to relocate an on-premise sign to the remainder property (i.e.: sign mover, electrical reconnection, permitting, direct losses, etc.).

As part of the Tier 1 analysis, six (6) alternatives have been studied. A synopsis of potential right of way impacts can be found in **Table 6.2**.

Table 6.2: Right-of-Way Impact Analysis

	POTENTIAL RIGHT OF WAY IMPACTS			
Service Segment	Maintenance and Operating Facilities	Transit Alignments and/or Transit Connections	Transit Terminals/Station Areas	Alignment Improvements
1	X	X	X	X
2	X	X	X	X
3	X	X	X	X
4	X	X	X	X
5	X	X	X	X
6	X		X	X

6.6. Conclusions and Commitments

Most Conclusions, Commitments, and Recommendations will be included once a public hearing is held. However, coordination regarding cultural resources has been undertaken with the Florida SHPO. It is important to note that historic linear resources that will require further research and documentation during the Tier 2 phase were encountered during the reconnaissance survey. These include potentially significant roadways, canals, and railroad corridors such as the FEC Railway, US-1, Dixie Highway, Miami Canal, and other major canals related to the Everglades Drainage District. Due to the nature of these resource types and the major intent of this phase of the project, they are not included in the report but will be covered more thoroughly in Tier 2. On June 9, 2006 a meeting was held with Sherry Anderson, SHPO representative, in order to discuss historic linear resources related to this project. It was established that until more specific information about the types of improvements that may affect historic linear resources is determined, a definitive approach for Tier 2 cannot be developed at this time. In addition, the FDOT Environmental Management Office, in conjunction with the FHWA, is currently working on specific cultural resources issues including historic linear resources. It is possible a protocol for the identification, documentation, and evaluation of such resources will be in place for the Tier 2 cultural resources studies. Specific commitments of this Tier 1 Draft PEIS are that further evaluation of environmental resources, and cultural resources, will be completed in Tier 2 of the study once segments and Class of Action determinations are made. These Class of Action determinations are not anticipated until the beginning of Tier 2. Other specific commitments include:

- **Detailed evaluation of avoidance and minimization measures for environmental issues** identified in Tier 1 and quantified in Tier 2 will be conducted in Tier 2 as segment-specific alternative alignments are developed.

- **Mitigation measures and, potentially, permit requirements** following the most current statutory regulations will be developed for any unavoidable effects on federal and state regulated natural resources by a preferred segment alternative developed during Tier 2 studies.

- **More detailed SFECCTA studies are also anticipated to be conducted in Tier 2** on issues identified in Tier 1, including (but not limited to):

  - Section 4(f) coordination for public parks, cultural resources.

  - Section 6(f) evaluation (Land and Water Conservation Fund Act) for any public parks affected that are funded through this manner.

  - Navigation issues such as potential USCG permits for crossings of New River, Loxahatchee River, ICWW, and others.

  - Evaluation of impacts and mitigation such as for wetlands, listed species (endangered, threatened, with ESBA reports), essential fish habitat, conservation lands (scrub, mangroves, coastal hardwood hammock communities, etc.).

  - Noise and Vibration including quiet zones for train horns and potential consideration of noise abatement such as noise walls.

  - Railroad crossing consolidation impacts including those to local street traffic circulation patterns and interference with community (commerce, schools, emergency response, religious centers, etc.)

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7. PUBLIC COMMENT AND AGENCY COORDINATION

7.1. Scoping Comments and Results

7.1.1. Agency and Elected Officials Kick-off Meetings

Agency and elected officials kick-off meetings were held on December 12, 15 and 19, 2005 in Miami City Hall Commission Chambers, Broward County Main Library Auditorium, and West Palm Beach Cohen Pavilion at Kravis Center, respectively (**Figure 7.1**). The purpose of the meetings was to provide an overview of the project and the Tiered PDEIS process. The meeting format included one-on-one question and answer period with the consultant team and FDOT display boards, a PowerPoint presentation, and a group question and answer period.

Figure 7.1: Elected Officials/Agency Representative Kick-Off Meeting (December 12, 2005)

Photo 1: One-on one question and answer period

Photo 2: Presentation

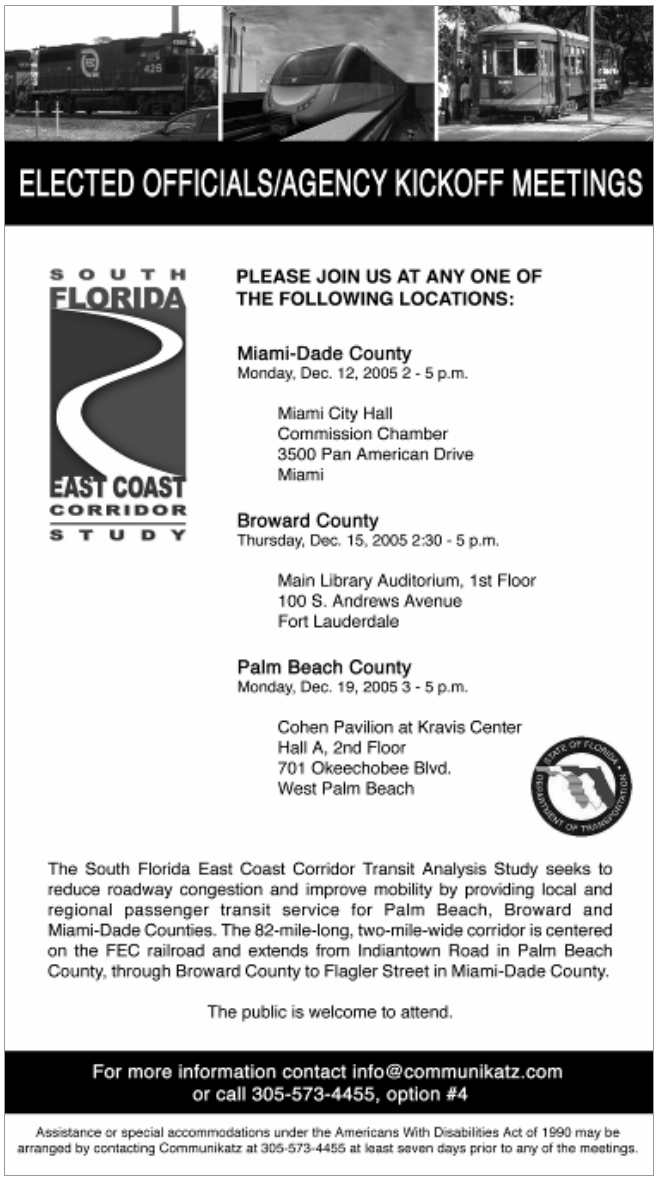
Photo 3: One-on-one question and answer session

Photo 4: Group question and answer session

Over 1,300 agency representatives and elected officials of the Tri-County area were invited to attend the kick-off meetings by Mr. Jim Wolfe, P.E., FDOT District 4 Secretary. The meetings were also advertised

by various City Clerk offices as well as by local newspapers (**Figure 7.2**). In attendance at the meetings were 33, 71 and 55 individuals in Miami-Dade, Broward and Palm Beach Counties, respectively. In general the majority of the attendees were in support of providing passenger service along the FEC corridor. The following issues were discussed: time of implementation; funding and transit priorities; rail freight; grade crossings, quiet zones and crossing delays from freight trains; transit stations, TOD and local zoning; right-of-way acquisition and potential impacts; historic resources; hurricane impacts; cyclists, pedestrians and greenways; municipal support for transit; minimization of transfers and use of a single technology; east-west connections; maintenance facilities; and navigable and sensitive waterway crossings.

Figure 7.2: Newspaper Display Advertisements



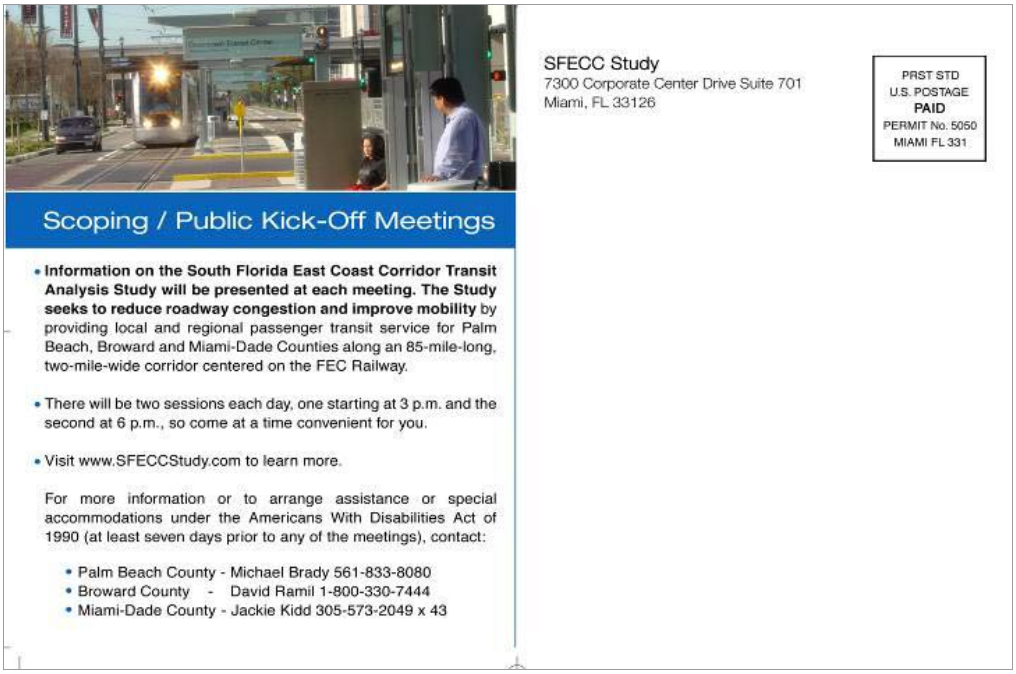
7.1.2. Scoping and Public Kick-off Meetings

Scoping and public kick-off meetings were held on April 17, 19 and 24, 2006 in Broward County Main Library, Miami-Dade County Gwen Margolis Community Center, and West Palm Beach Cohen Pavilion at Kravis Center, respectively. Two sessions per day were conducted at each location, one at 3:00 PM and the other at 6:00 PM. The purpose of the meetings was to comply with the scoping process and to introduce the general public to the project. The format of the meetings included an individual question and answer period around display boards with the consultant team and FDOT personnel, a PowerPoint presentation, and a group question and answer period.

Over 1,300 residents from the Tri-County area were invited to attend the public kick-off meetings by Mr. Gustavo Schmidt, P.E., FDOT District 4 District Planning and Environment Engineer. Over 222,000 invitation postcards were mailed out to property owners, businesses and other stakeholders located along the FEC corridor in the Tri-County area (**Figure 7.3**). Over 1,300 electronic invitations were sent to those individuals on the project mailing list who have included an e-mail address. In addition, the scoping and public kick-off meetings were advertised locally in area newspapers as well as in the Public Meetings section of the project website. The total number of attendees at the Miami-Dade, Broward and Palm Beach meetings were 150, 189, and 104 respectively. A 13-page color Scoping Information Booklet, a 4-page project fact sheet and a 4-page project Frequently Asked Questions (FAQ) handout were produced in English, Spanish and Creole and distributed to all attendees at the meeting. Written Comment Cards were also distributed and collected at the end of each meeting.

In general, the majority of the attendees were in support of providing passenger service along the FEC corridor. The following issues were discussed: Project costs; timeliness of implementation; transit use incentives and public education, express versus local transit services; need for a single and seamless mode/technology; quiet zones; noise/vibration impacts and noise abatement; brownfields; potential right-of-way impacts and relocations; funding sources; greenway; potential property value impacts; east-west and intermodal connections; station locations and zoning; rail freight; grade crossings and traffic impacts; elevated versus at-grade technologies; landscaping buffers; affordable housing and connections to employment centers; integration with existing Tri-rail service; use of ETDM process; future intercity rail service; parking supply and costs; navigable waterway crossings; and FEC railway position on new passenger service. Although Native American owned lands were discussed at the kick-off meetings, there are no tribal lands in the project vicinity as referenced in Chapter 3.

Figure 7.3: Postcard Invitation



7.1.3. Environmental Technical Advisory Team (ETAT) Coordination

Invitations were sent via correspondence as well as electronically to FDOT ETAT personnel to attend an ETAT presentation held on July 12, 2006. ETAT members from both Districts 4 and 6 who attended were provided with a presentation illustrating the tiered NEPA process and how it applies to this project.

7.2. Federal, State, and Local Agency Coordination

7.2.1. Efficient Transportation Decision Making (ETDM)

➢ **The Transportation Equity Act for the 21st Century**

Passed by the U.S. Congress in July 1999, TEA-21 contained initiatives (specifically in Section 1309) for planning transportation projects and conducting environmental reviews that are known as "streamlining" provisions. The objectives in TEA-21 included:

- Effective/timely decision making without compromising environmental quality
- Integrating review and permitting processes
- Early NEPA reviews and approvals

- Full and early participation
- Meaningful dispute resolution

These initiatives were in response to concerns expressed by citizens regarding the amount of time it takes to implement a transportation project. In addition, departments of transportation, agencies, citizens and non-governmental organizations have seen the inefficiency in implementation of the NEPA environmental reviews when long time periods elapse between agency NEPA reviews and the environmental reviews conducted during project permitting. The FDOT seized the initiative when Congress passed TEA-21 and decided to reexamine the Department's entire process from the very early stages of planning through project development and permitting. Revamping the entire process required that a more efficient methodology be used to present project planning information and to gather input from agencies and the affected community. As part of the new ETDM process for the State of Florida, the FDOT implemented an Internet-accessible interactive database tool, which is in current use by the review agencies as they review the SFECCTA in Tier 1. The ETDM project number established for Tier 1 of the SFECCTA is 7519.

- **The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU):** The environmental streamlining initiatives contained in TEA-21 Section 1309 were furthered in SAFTETEA-LU when it was passed on August 10, 2005 as Public Law 109-59 (PL 109-59), authorizing federal surface transportation programs for highways, highway safety, and transit for the 5-year period 2005-2009. FDOT and FHWA have established that the ETDM process fulfills statutory requirements of SAFTETEA-LU Section 6002, Efficient Environmental Reviews for Project Decision making, and is approved by FHWA for use in development of federal-aid projects. Finally, FHWA participation in the ETDM project 7519 for SFECCTA is consistent with Section 6002(b) of SAFETEA-LU, wherein states have the option of continuing to advance projects under processes "approved" under TEA-21's Section 1309 authority.

FDOT has also formed ETAT, consisting of representatives from agencies which have statutory responsibility for issuing permits or conducting consultation under NEPA. The ETAT membership for FDOT Districts 4 and 6 is provided in the **Table 7.1** and **Table 7.2**, below.

Table 7.1: FDOT District 4 ETAT Members

Role	Agency
ETDM Coordinator	FDOT District 4
CLC Coordinator	FDOT District 4
CEMO Liaison	FDOT District 4
ETAT Member	FL Department of Transportation
MPO ETDM Coordinator	Indian River County MPO
MPO ETDM Coordinator	Broward County MPO
MPO ETDM Coordinator	St. Lucie MPO
MPO ETDM Coordinator	Indian River County MPO
MPO ETDM Coordinator	Broward County MPO
MPO ETDM Coordinator	Palm Beach MPO
ETAT Member	Palm Beach MPO
MPO ETDM Coordinator	Martin County MPO
ETAT Member (1)	US Environmental Protection Agency
ETAT Member (2)	US Environmental Protection Agency
ETAT Member (1)	US Army Corps of Engineers
ETAT Member (2)	US Army Corps of Engineers
ETAT Member (3)	US Army Corps of Engineers
ETAT Member	US Fish and Wildlife Service
ETAT Member	US Coast Guard
ETAT Member (1)	Federal Transit Administration
ETAT Member (2)	Federal Transit Administration
ETAT Member (1)	Federal Highway Administration
ETAT Member (2)	Federal Highway Administration
ETAT Member (3)	Federal Highway Administration
ETAT Member (4)	Federal Highway Administration
ETAT Member (5)	Federal Highway Administration
ETAT Member (1)	National Marine Fisheries Service
ETAT Member (2)	National Marine Fisheries Service
ETAT Member	National Park Service
ETAT Member	Natural Resources Conservation Service
ETAT Member	Seminole Tribe
ETAT Member	Miccosukee Tribe
ETAT Member (1)	FL Department of State
ETAT Member (2)	FL Department of State
ETAT Member (1)	FL Department of Community Affairs
ETAT Member (2)	FL Department of Community Affairs
ETAT Member (1)	FL Fish and Wildlife Conservation Commission
ETAT Member (2)	FL Fish and Wildlife Conservation Commission
ETAT Member (3)	FL Fish and Wildlife Conservation Commission
ETAT Member (4)	FL Fish and Wildlife Conservation Commission
ETAT Member (5)	FL Fish and Wildlife Conservation Commission
ETAT Member (1)	FL Department of Environmental Protection
ETAT Member (2)	FL Department of Environmental Protection
ETAT Member (1)	FL Department of Agriculture and Consumer Services
ETAT Member (2)	FL Department of Agriculture and Consumer Services
ETAT Member	South Florida Water Management District
ETAT Member	Saint Johns River Water Management District

Table 7.2: FDOT District 6 ETAT Members

Role	Agency
ETDM Coordinator	FDOT District 6
CLC Coordinator	FDOT District 6
CEMO Liaison	FDOT District 6
Public Information Officer	FDOT District 6
ETAT Member (1)	FDOT District 6
ETAT Member (2)	FL Department of Transportation
MPO ETDM Coordinator	Miami Urbanized Area MPO
ETAT Member (1)	US Environmental Protection Agency
ETAT Member (2)	US Environmental Protection Agency
ETAT Member (1)	US Army Corps of Engineers
ETAT Member (2)	US Army Corps of Engineers
ETAT Member (3)	US Army Corps of Engineers
ETAT Member	US Fish and Wildlife Service
ETAT Member	US Coast Guard
ETAT Member (1)	Federal Transit Administration
ETAT Member (2)	Federal Transit Administration
ETAT Member (1)	Federal Highway Administration
ETAT Member (2)	Federal Highway Administration
ETAT Member (3)	Federal Highway Administration
ETAT Member (4)	Federal Highway Administration
ETAT Member	National Marine Fisheries Service
ETAT Member	National Park Service
ETAT Member	Natural Resources Conservation Service
ETAT Member	Seminole Tribe
ETAT Member	Miccosukee Tribe
ETAT Member (1)	FL Department of State
ETAT Member (2)	FL Department of State
ETAT Member (1)	FL Department of Community Affairs
ETAT Member (2)	FL Department of Community Affairs
ETAT Member (1)	FL Fish and Wildlife Conservation Commission
ETAT Member (2)	FL Fish and Wildlife Conservation Commission
ETAT Member (3)	FL Fish and Wildlife Conservation Commission
ETAT Member (4)	FL Fish and Wildlife Conservation Commission
ETAT Member (5)	FL Fish and Wildlife Conservation Commission
ETAT Member (1)	FL Department of Environmental Protection
ETAT Member (1)	FL Department of Agriculture and Consumer Services
ETAT Member (2)	FL Department of Agriculture and Consumer Services
ETAT Member	South Florida Water Management District

- **Environmental Screening Tool (EST):** The ETAT members may provide comment on the project based on information presented (or "loaded") in the EST, which is operated and maintained by the Florida GeoPlan Center at the University of Florida in Gainesville, Florida.[7]

  An innovative technology application, the EST provides a vital foundation to the ETDM process, supporting agency participation and community involvement throughout the project life cycle. The EST is an Internet-accessible application that provides tools to input and update information about transportation projects, perform standardized analyses, gather and report comments about potential project effects, and provide information to the public. The EST user community includes staff from seven FDOT district offices, 26 MPOs, approximately 26 resource agencies, and the general public (public access via http://etdmpub.fla-etat.org/). Performing an "Advanced Search" with the ETDM Project Number established for the SFECCTA ("7519") links the user to the project's ETDM public information screens.

- **Environmental Technical Advisory Team (ETAT) Coordination:** Each FDOT District has an ETDM Coordinator, and for the SFECCTA the District 4 lead ETDM Coordinator is also the point of contact for EST implementation. For example, the District 4 ETDM Coordinator uploaded the AN on the EST for the ETAT to review. The ETDM Coordinator also prepares the ETDM Programming Summary Report, which is included in Appendix C with the Coordinator's summary of effects response to individual ETAT comments. In addition, the ETAT Coordinators for FDOT Districts 4 and 6 are routinely involved in monthly progress meetings on the SFECCTA Study.

  With several regional projects underway in Southeast Florida, the FDOT Districts 4 and 6 have joined in ETAT Coordination efforts. The SFECCTA Study was presented during a recent Joint ETAT Workshop on July 12, 2006. The key project issues highlighted during the workshop included the Tiered NEPA process, and summarizing the status of the study to date. The AN responses were summarized and discussed, from both the hardcopy AN circulation responses as well as the electronic version uploaded on the EST.

7.2.2. Class of Action Determination

The Class of Action Determination for the SFECCTA was determined through coordination with the FTA Regional Office in Atlanta, Georgia. In a letter dated August 11, 2005, the FTA agreed to be the lead agency the development of the Tiered EIS. This determination letter is attached in Appendix B.

[7] http://www.geoplan.ufl.edu/

7.2.3. Advance Notification (AN)

The AN for the SFECCTA is the first step in Tier 1 of a Tiered, DPEIS that includes Transit Feasibility and AA. The AN fulfills the Intergovernmental Coordination and Review (ICR) Process that is required by the President's Executive Order 12372 and the Governor's Executive Order 95-359. This document serves as the initial public outreach and coordination effort in Tier 1, to be followed by separate ANs for future Tier 2 Analysis of independent SFECCTA sections as they are initiated. The format of the AN for the SFECCTA incorporates both the FTA guidelines for public notification of AA Studies for New Starts Funding while simultaneously addressing FHWA guidelines as per Part 1, Chapter 2 of the FDOT PD&E Manual. This hybridized approach followed a modified AN outline that is summarized in a separate Technical Memorandum available in the documents section of the project website (www.SFECCStudy.com/documents.html).

- **Advance Notification Package:** Due to the magnitude of the project and the readily available digital data for GIS analysis from local, state (e.g., FGDL, SFWMD, Universities such as Florida International University, University of Florida, and University of Miami), and federal sources, a very detailed AN (over 70 pages) was circulated in January 2006 to a large distribution of federal, state, and local government agencies and other interested parties. Over 1,200 recipients were copied on the AN in accordance with the FDOT list of recipients contained in a Technical Memorandum summarizing the AN Responses (available online on the project website at http://www.sfeccstudy.com/documents.html). The AN was circulated both by mail and by uploading to the ETDM EST for ETAT members to review. The AN had an expanded outline blending FTA, FHWA, and FDOT formats, as outlined in the AN and Responses Technical Memorandum.

- **Advance Notification Responses Summary:** A table summarizing the responses received to the AN is included in the AN Responses Technical Memorandum. The AN responses include 19 agencies and a private company that responded to the January 2006 AN. All concerns have been addressed in the Technical Memorandum or have been deferred to Tier 2 if that was the most appropriate course of action. The FDOT, through the AN process, informed a number of federal, state, and local agencies of the existence of this project and its scope. The FDOT initiated early project coordination on January 23, 2006, by distributing the AN package to the State Clearinghouse at the Florida Department of Environmental Protection (FDEP) in Tallahassee, Florida. In addition, the FDOT submitted over 1,200 individual packages to more than 130 federal, state, and local governments. These agencies, governmental bodies, and other entities that received, as well as those who responded to the AN, are listed in the Technical Memorandum.

7.2.4. DPEIS Comment Summary

Comments in response to the DPEIS will be collected from cooperating and commenting agencies as well as comments received during public hearings and will be summarized and incorporated in this section of the document. Furthermore, the SFECCTA will be available on the project website for electronic public review with an on-line comment input form. These public and intergovernmental coordination and review venues will be fully advertised at the federal (Federal Register Notice of Availability of DPEIS), state (Florida Administrative Weekly notification), and local (newspapers, Public Hearing mass mailings/e-mail notifications) levels prior to the Public Hearings and for the required open record period following the latest of the Public Hearings meeting dates.

7.2.5. Local Agency Resolutions Supporting Project

Broward County: The City of Ft. Lauderdale adopted Resolution Number 02-179 to the City Commission on October 15, 2002. This resolution supports FDOT and the SFRTA for strategic investment in transit along the FEC Corridor area.

Miami-Dade County: Eight municipalities comprising the Northeast Miami-Dade Mayor's Joint Task Force on Transportation adopted Resolution Number R2006-01 on April 5, 2006. This resolution expresses support for the Miami-Dade County MPO funding the FDOT for the SFECCTA study and encourages FDOT to complete the study by no later than July 2006 in the effort to implement a rapid transit system.

These resolutions are attached in Appendix I.

7.2.6. Other Agency Correspondence

South Florida Regional Transportation Authority (SFRTA) responded to the AN for SFECCTA, (see Appendix G, Regional Agency Correspondence) with the following comments:

The Executive Director expressed that a transit project along the FEC Railway corridor between Jupiter and downtown Miami is one of five projects adopted by the SFRTA Board of Directors as a part of the SFRTA Master Plan. The proposed project is supportive of the SFRTA goals, while the project's regional nature is representative of the purpose of SFRTA.

7.2.7. Public Hearings

There will be three Public Hearings, one in each County. The Public Hearings for the SFECCTA Study are scheduled for November 2006. Notification will be by postcard to each agency, elected official, business contact and member of the general public in the database for that county. There will be newspaper advertisements, and notice in the Florida Administrative Weekly. Notices will also be

transmitted electronically and posted on the project website. Information developed to date will be presented by members of the study technical team. At the Public Hearing, interested parties may seek additional information, voice their concerns or express support for various concepts. The Consultant Team will procure a verbatim transcript of the Public Hearing, as well as combine the transcript with any letters received by the FDOT as part of the public hearing record. In addition, affidavits of publication of legal ads will be made available. Those wishing to express opinions without speaking may fill out comment cards to be included in the public record.

7.2.8. Municipal Workshops

Municipal Workshops were held on May 22 and 23, 2006 in Delray Beach City Hall and the South Florida Regional Planning Council in Hollywood, respectively. The purpose of these workshops was to provide a forum for Mayors and other elected municipal officials and city managers and department directors to offer input on the project. These workshops also provided the opportunity for the elected officials to interact with their counterparts in other municipalities to discuss issues of mutual interest. The format for the workshops included a presentation and status report on the project and an agenda of discussion items that included: freight traffic, noise, quiet zones, vibration, land use, station area planning, property values, traffic circulation, rail crossing closings, elevated transit, municipal transit service and current and potential funding sources.

7.3. Public Involvement Program (PIP)

The scale and complexity of the SFECCTA study requires a comprehensive, as well as specialized public involvement effort. The Consultant Team was responsible for preparing a comprehensive Public Involvement Program (PIP) document for submittal and approval by the FDOT. At the initiation of the study, a schedule of tasks, meetings, presentations, and milestones was be developed by the Consultant Team and reviewed by the FDOT Districts 4 and 6.

Within each of the three counties, the PIP goals are to:

- Identify stakeholders and inform them of the study and of opportunities to participate in it
- Reach out to minority and low-income populations by producing materials in English, Spanish and Creole
- Encourage participation by representatives of community organizations that could benefit from enhanced public transit in the SFECCTA
- Educate the public by using language that is easily understood by laypersons

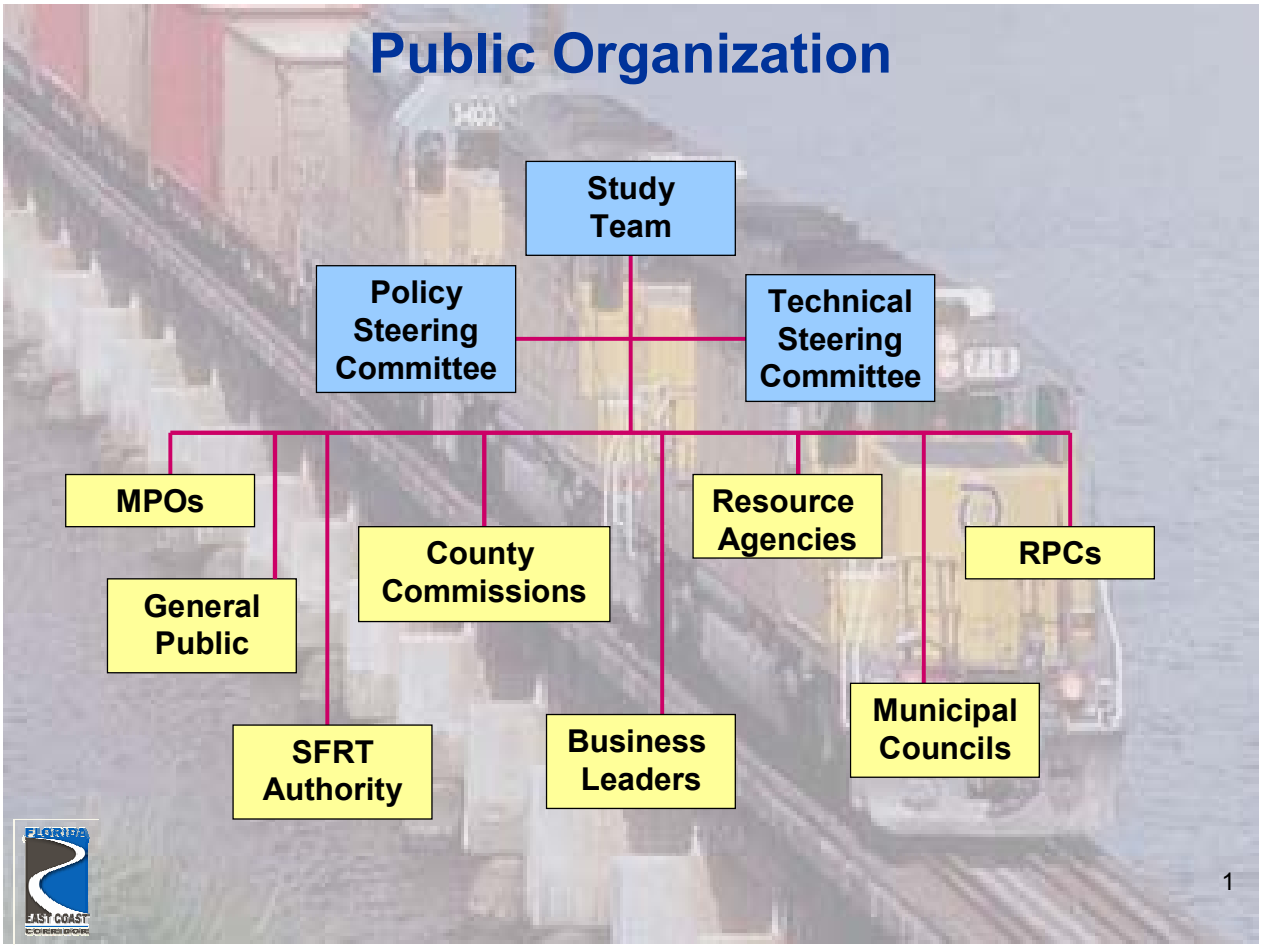
- Provide opportunities for interaction between stakeholders and the study's technical team
- Maintain an ongoing dialogue between stakeholders and the study team
- Meet the requirements of the NEPA/ETDM processes
- Generate awareness, consensus and support for the project

The universe of affected and interested parties in such a large-scale study is considerable. **Figure 7.4** represents the organization of the project's many public entities. Individuals within each group have been identified and added to the project database as they have become known.

Those groups are:

- Policy Steering Committee
- Technical Steering Committee (TSC)
- MPOs of Miami-Dade, Broward and Palm Beach Counties
- County Commissions of the three counties
- Resource agencies
- Regional Planning Councils (two)
- SFRTA
- Business leaders
- Municipal councils from the jurisdictions through which the study corridor passes
- General public

Figure 7.4: Flow Chart of Public Organization



The approach to developing the PIP and conducting the public involvement activities included coordination with and review by the Public Involvement Managers from the three MPO. The Consultant Team includes 4 public involvement firms because of the length and density of the study area. Three public involvement firms were each assigned one county within the study area. The fourth firm has been responsible for outreach to the business communities in the three counties. This public involvement team has worked expeditiously by conducting concurrent efforts in the three counties and by consulting with one another so as not to duplicate efforts. All team members had familiarity with satisfying the public involvement requirements of the NEPA and FDOT's ETDM processes.

The PIP was approved by the FDOT Project Manager on June 1, 2006.

The Department will not make a final decision on the proposed action or any alternative until a public hearing has been held on this project and all comments received have been taken into consideration.

7.3.1. Mailing List and Newsletters

- **Mailing Lists:** The development of the project mailing database commenced at the outset of the study and will continue throughout the project as the database is updated to include new persons, businesses and organizations as they become known to the Consultant Team. Gathering of e-mail addresses and fax numbers has been a critical task, because mailing of all meeting notices and study material is unfeasible due to the exceptionally large number of individuals living and working within the study area. Each public involvement team firm has gathered contact information on elected officials, agencies, civic organizations, property owners and business operators within its respective county. Representatives of homeowner and community groups and major business interests within the study corridor have also been identified and included in the project database.

  Lists of those who use the para-transit services of the Palm Tran Connection in Palm Beach County; the Transportation Options (TOPS) program in Broward County and the Special Transportation Service (STS) in Miami-Dade County are not readily released. However, every effort has been made to inform them of all the public meetings. Additionally, a significant effort was undertaken to take advantage of the travel surveys performed to reach out to travelers within the study corridor, particularly those that currently utilize bus transit. Two types of comprehensive weekday surveys were performed for travelers in the study area with information provided in English, Spanish, and Creole:

  - A mailed license plate O&D survey for drivers at 21 stations along I-95, US-1 and Dixie Highway in all three counties, and
  - An on-board transit survey for bus riders on 21 north-south bus routes in the three counties located near the study corridor.

  The mailed license plate survey included a listing of the project website address in large bold letters and a 1-800 phone number set up for assistance. The on-board transit survey included a listing of the project website address in large bold letters as well as a space (Question # 17) for respondents to provide a mailing address or e-mail address to be added to the project mailing list. The license plate survey was mailed out to over 64,000 Florida-registered vehicle addresses while the on-board transit survey was distributed to over 4,700 bus riders. Almost 2,000 of the on-board surveys were completed and returned with approximately 650 containing an e-mail address. For comparison, over 8,137 license plate surveys were returned but it was an anonymous survey therefore no additional e-mail addresses were obtained.

  In the interest of economy, the database has been limited to 300,000 contacts, or 100,000 in each county. The database includes:

- Federal, state and local officials and agencies
- News media
- Homeowner and condo association officers
- Business associations
- Para-transit users
- Individual business and property owners within in the study area (limited to 100,000 in each county)

- **Newsletters:** Two color newsletters are provided at two project milestones. The first newsletter was published in June 22, 2006 after the initial screening of alternatives was completed. This first project newsletter was distributed during the Public Workshops held throughout the study corridor (June 22, 26, 27, 28, and 29, 2006) and also distributed to interested stakeholders by the Consultant Team via handout during the course of the study and by mailing to review agencies, citizen committees and other parties on the project mailing list.

  The second newsletter will be published at the end of October prior to the November public hearings.

  The newsletters are being produced in three languages (English, Spanish and Creole) and distributed according to the project corridor demographics.

- **FAQ's and Project Fact Sheet:** Two black and white Frequently Asked Questions (FAQ's) handouts and one color Project Fact Sheet were produced and distributed at two project milestones. The FAQ's were also posted on the project website. The first FAQ and the Project Fact Sheet were published in April 2006 prior to the Scoping and Public Kick-off Meeting. The second FAQ handout was produced in August 2006 for the Public Workshops. All three items were produced in English, Spanish and Creole and were distributed at the meetings and to other interested stakeholders at other venues that followed. Each of the FAQ's was a four page foldout that included an introduction, the FAQ's, a project location map, team contact information, and the project website address. The Project Fact Sheet was a five page handout that included a description of the project, project history, project schedule, project costs, project issues, the project website address, and a project location map.

7.3.2. Website/Email Link

A stand-alone project website has been developed (http://www.SFECCStudy.com). The website is consistent with the FDOT policies and has been designed to provide summarized and detailed project information and to visually inform visitors about how various alternatives and potential station areas are

situated within the study area throughout the region. The website has been updated nearly every two weeks to reflect the progress of the study, thereby keeping visitors interested in returning to the website. Website updates have included news items, document uploads, project schedule updates and notices of public workshops. Also of note, the website includes reciprocal hyperlinks to/from the websites of partners in the study; MPO and transit agencies **Figure 7.5** provides a “screenshot” of the project website.

Figure 7.5: Project Website

As a way of making technical memoranda, reports and graphic-intensive project illustrations available to the review agencies and the general public, the project website is also used as repository for project documentation. This is in addition to FTP sites made available by the consultant team members to the review agencies for download of selected project documentation.

As an added feature to the project website, an e-mail sign-up dialog box appears in the upper right-hand corner of the homepage for users to sign-up to be placed on the SFECCTA mailing list.

7.3.3. Press Releases

Press releases are prepared by the Consultant Team for television and radio to promote the project and to announce dates/times and promote attendance at upcoming public meetings. The public involvement managers of the 3 MPOs are also assisting the study team in this regard. Press releases and public service announcements are prepared in three languages (English, Spanish and Creole).

7.3.4. Pertinent Correspondence

- Pertinent Project Correspondence includes newspaper display advertisements, direct mailings (letters and postcards), electronic postcards, municipal calendar notices and comment cards.

- Newspaper display advertisements have been published in the Miami Herald, Sun-Sentinel and Palm Beach Post newspapers, as well as selected community newspapers to draw attention to the project and attract larger audiences to the various meetings.

- Direct mailings to property owners, elected and municipal officials have included letters and postcards notifying stakeholders of upcoming public meetings and workshops.

7.3.5. Other Meetings/Presentations

The list of Scheduled Public Meetings conducted is presented in **Table 7.3** and includes the Elected Officials/Agency Representatives Kick-Off Meetings (one in each county), the Public Kick-Off / Scoping Meetings (one in each county). Numerous meetings with technical and citizen review committees and several unscheduled meetings with interested parties such as homeowner associations and civic groups have also been conducted. In addition, a total of 16 meetings with local business leaders have been held to date. These meetings were held in a one-on-one format with the business leaders from June through September, 2006. Several additional one-on-one meetings, and meetings with groups of business leaders, are currently scheduled in the upcoming months. Additional business individuals and groups will be contacted as identified throughout the study process.

Of the 28 municipalities along the SFECCTA corridor, we have appeared before and conducted a total of twelve presentations to Mayor and City Commission/City Council and Village Council members between the months of June 30, 2006 to September 12, 2006. Meetings were informational and included updates on the alternatives and segmental priorities selected in Tier 1 as well as discussions on the role the municipalities may play in supporting the proposed project. Some of the comments that were received from the City Mayors and City Commission members during the presentations related to potential financing of the project, station suitability study, and security at the proposed station areas. These meetings also afforded meeting attendees and citizens information on project updates. Additional Mayor

and City Commission meetings, for cities located along the SFECCTA study area have been scheduled for the end of September as well as the months of October and November 2006.

Table 7.3: Summary List of Scheduled Public Meetings Held

Audience	Number of Presentations/Briefings
Public Meetings/Workshops	16
Technical Review Committees	11
Citizens' Review Committees	8
Transportation Policy Boards	8
City/Town Councils	12
Municipal Workshops	2
Municipal Officials / Community Leaders	23

Note: Three public hearings (one each in Miami-Dade, Broward, and Palm Beach Counties are scheduled to occur in November 2006.

7.4. Public Workshops

Two series of Public Workshops were held; one series of five in late June and one series of five in late August and Mid-October. The first series concentrated on informing the general public about the project, particularly with updating them on progress of the study since their first exposure to it in April 2006 during the Public Kick-Off / Scoping Meetings. The second series of workshops followed in the same vein with providing updates on various aspects of the study and continuing to ask input on the narrowed selection of alternatives and station locations. For both series of meetings, the project website was updated with the presentations used as well as the project illustrations referred to during the workshops. Meeting summaries of the workshops were also posted on the project website.

7.4.1. Public Workshop Series 1 (June 2006)

Public Workshops were held throughout the study area on June 22, 26, 27, 28 and 29, 2006. All workshops were conducted from 6 to 8 PM in the following locations as follows:

- Miami-Dade County: Thursday, June 22 at the Gwen Margolis Community Center
- Palm Beach County: Monday, June 26 at the Delray Beach Community Center
- Broward County: Tuesday, June 27 at the Hollywood Performing Arts Center
- Palm Beach County: Wednesday, June 28 at the Palm Beach Gardens Municipal Complex
- Broward County: Thursday, June 29 at the Mitchell Moore Community Center

Over 227,000 invitation postcards were mailed out to property owners, businesses and other stakeholders located along the FEC corridor in all three counties. Over 1,300 E-mail invites were sent to those individuals in the project mailing list who have included an e-mail address. Local advertisements in area newspapers were also placed in advance of the meetings and were advertised in the Public Meetings section of the project website. Electronic postcards were sent via email to municipalities within the study area, and requests were made to place the meeting date, time and location on the municipal calendars and bulletin boards. Attendance at the meetings included 85 individuals in Miami-Dade County, 87 and 34 individuals in the workshops held in Broward County, and 40 and 59 individuals in the workshops held in Palm Beach County (305 total). Materials distributed and available at the workshops included a 4-page color project newsletter, a 13-page color Scoping Information Booklet and a 4-page project FAQ handout. The Scoping Information Booklet and FAQ handout were available in English, Spanish and Creole. A Creole translator was available at the workshop conducted in Miami-Dade County. Written Comment Cards were also distributed and collected during the meetings.

The purpose of the workshops was to update the general public on the project and to engage attendees in discussion on alternatives, technologies, station areas and other study-related issues such as freight traffic, noise, quiet zones, land use, traffic circulation, rail crossing closings, elevated transit, and current and potential funding sources.

The workshop format included an informal “open house” period in which attendees could view project illustrations posted around the room. Study team members were available to assist the public in examining the aerials and exhibits and answer questions regarding the project. The workshop also included a PowerPoint presentation, and a group question-and-answer period.

In general the majority of the attendees were in support of providing passenger service along the FEC corridor. It is also noteworthy that most expressed a preference for the FEC alignment as compared with either the US-1 or I-95 alignment. The following study-related issues were discussed: project schedule; current and potential project funding sources; costs of alternatives, including grade-separated alignments; need for a single and seamless mode/technology; quiet zones; rail freight; zoning, station areas and typical measures of land needed for stations and maintenance facilities; east-west and intermodal connections; grade crossings, grade crossing closings and traffic impacts; elevated versus at-grade technologies; integration with existing Tri-Rail service; and coordination with municipal comprehensive development master plans.

7.4.2. Public Workshop Series 2 (August and October 2006)

The second series of Public Workshops was scheduled throughout the study area for August 21, 22, 24, 28 and 29, 2006 to be conducted from 6 to 8 PM in the following locations as follows:

- Broward County: Monday, August 21 at the Hollywood Performing Arts Center
- Broward County: Tuesday, August 22 at the E. Pat Larkins Community Center
- Palm Beach County: Thursday, August 24 at the Palm Beach Gardens Municipal Complex
- Palm Beach County: Monday, August 28 at the Delray Beach Community Center
- Miami-Dade County: Thursday, August 29 at the Gwen Margolis Community Center

Over 230,000 invitation postcards were mailed out to property owners, businesses and other stakeholders located along the FEC corridor in all three counties. Over 1,300 E-mail invites were sent to those individuals in the project mailing list who have included an e-mail address. Local advertisements in 6 area newspapers were also placed in advance of the meetings and were advertised in the Public Meetings section of the project website. Electronic postcards were sent via email to municipalities within the study area, and requests were made to place the meeting date, time and location on the municipal calendars and bulletin boards. Public Service Announcements were distributed to 11 media outlets including newspaper, television and radio. Notices were also posted on city and county calendars. Attendance at the meetings totaled 74 and 50 individuals in the workshops held in Broward County, and 31 and 32 individuals in the workshops held in Palm Beach County (187 total). Due to Tropical Storm Ernesto, the August 29 Public Workshop planned for Miami-Dade County was cancelled and is being rescheduled for three workshops as follows: (1) Tuesday, October 10 at the Miami-Dade County Government Center, (2) Wednesday, October 11 at the Aventura Community Center, and (3) Thursday, October 12 at Legion Park. Materials distributed and available at the workshops has included a 4-page color project newsletter and a 4-page project FAQ handout. The FAQ handout is available in English, Spanish and Creole. A Creole translator will available at the workshop conducted in Miami-Dade County. Written Comment Cards were also distributed and collected during the meetings.

The purpose of this second series of workshops was to update the general public on the project and to engage attendees in active discussion on alternatives, technologies, and service planning issues as well as land use and station area planning.

Similar to Public Workshop Series 1, the workshops conducted in August included an informal “open house” period in which attendees could view project illustrations posted around the room. Study team members were available to assist the public in examining the aerials and exhibits and answer questions regarding the project. The workshop also included a PowerPoint presentation. In a more directed effort as compared to Workshop Series 1, these workshops included more intimate break-out sessions on service planning and transit station suitability to more closely engage workshop participants and solicit their input.

During the service planning break-out sessions, a brief explanation was provided on how the analysis was conducted and self-adhesive flags and colored dots were distributed so that participants could indicate their preferences for alternatives segments and their priorities on the project illustrations posted around the room (**Figure 7.6**). Participants were invited to use 2 different colored adhesive dots to indicate where they would likely board and alight the rail or bus service if it were in place.

During the station suitability break-out sessions, attendees were provided with a brief explanation on how the analysis was conducted and then were also invited to identify and comment on potential station locations, indicating their preferences where stations should be located (or not be located), as well as make other comments regarding station amenities or other station-related issues. Photographic records were made of the self-adhesive notes on the various plots. These workshops concluded with a full group wrap-up and question-and-answer period.

Again, the majority of the attendees were in support of providing passenger service along the FEC corridor. The following study-related issues were discussed during the break-out group sessions:

- the need for east-west connections and connectivity with Tri-Rail;
- the need to continue to consider grade-separated alignments due to the number of rail crossings;
- noise and vibration;
- the logical placement of transit stations, and
- the need to consider station accessibility including non-motorized modes such as pedestrian and bicycle.

Workshop participants agreed, in general, with the preliminary conclusions of the study. Consensus was reached that the FEC corridor should be the preferred alignment, and that the US-1 corridor would be too expensive and impractical to develop as a high-performance*,* premium transit corridor throughout the study area. Some dissent was expressed from a small minority of workshop participants who expressed a desire for Tri-Rail service improvements as opposed to creating new service along the SFECCTA corridor. General consensus was also reached among workshop participants on the station area locations, as presented at the workshops and in the DPEIS.

Figure 7.6: Station and Service Planning Public Workshop

Photo 1: Showing the public giving their opinion, comments, approval or disproval of possible station areas along the corridor on the corridor maps

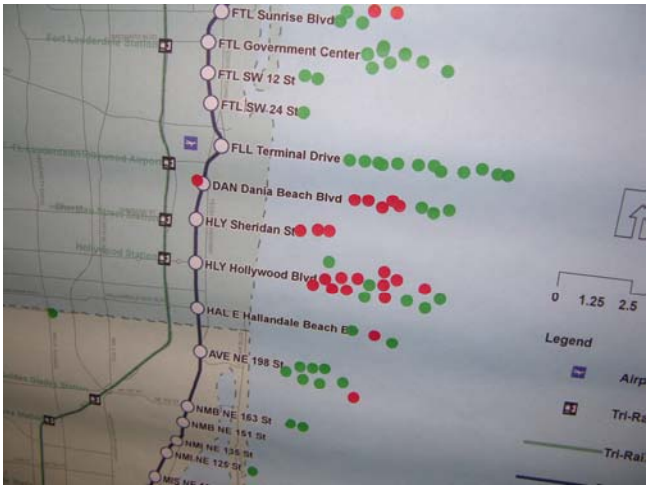


Photo 2: The public placed dots on the origin and destination of trips they would make along the corridor on maps displayed at the meeting

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9. LIST OF DPEIS PREPARERS

Company / Preparer Name	Title	Experience / Expertise
Federal Transit Administration		
▪ Mr. Tony Dittmeier	Transportation Programs Specialist	B.A. in Political Science and Master of Public Administration with 26 years experience in the planning, development, and management of federally funded transportation projects.
Florida Department of Transportation (District 4)		
▪ Mr. Scott Seeburger	Special Projects Manager	MSCE with 30 years experience in major investment studies, transit alternatives analyses, interstate multimodal master planning, and public/government review processes for transportation projects.
▪ Ms. Ann Broadwell	Environmental Administrator	M.S. in Biology with 14 years of experience in transportation related NEPA studies and environmental permit compliance.
▪ Ms. Sharon Rios	Transportation Specialist	B.S. degree in Urban Regional Planning with 5 years of experience in land development planning, site planning, community development, and assisting management with major transit investment studies.
Florida Department of Transportation (District 6)		
▪ Ms. Alice Bravo	Planning and Environmental Management Engineer	MBA degree with 15 years of experience in transportation related projects including bridge design, highway engineer and environmental management.
Gannett Fleming, Inc.		
▪ Mr. Carlos Cejas	Vice President	MBA degree with 20 years experience in transportation project management, highway and transit project development, traffic and travel studies, roadway final designs and plan preparation, and bridge design for major transportation projects in south Florida.
▪ Ms. Odalys Delgado	Planning and Project Development Manager	M.A. degree in Public Administration with 18 years of experience in planning and program management for transportation programs and projects.
▪ Mr. Robert T. McMullen	Director of Environmental Services	M.S. degree in Environmental Sciences with 18 years of experience in environmental science and NEPA studies for transportation programs and projects, environmental restoration projects, and teaching Marine Science.
▪ Mr. Omar Beceiro	Environmental Scientist	B.S. degree in Biology with 8 years of experience environmental and biological work including transportation related projects.
▪ Mr. Alejandro Cuadra	Graphic Designer	B.S. with 4 years of experience in graphic design.
▪ Mr. Hoyt Davis	Senior GIS Analyst	B.S. in Computer Science and Information with 14 years of experience with data development for transportation and environmental projects, mapping and analysis purpose.

Company / Preparer Name	Title	Experience / Expertise
Gannett Fleming, Inc.		
▪ Mr. Tom R. Hickey	National Transit Planning Manager	B.A. degree in Urban Geography with 28 years of experience in construction design and planning of mass transit, and railroad operations.
▪ Mr. Nick Karcz	Transportation Planner	B.A. degree in Urban and Regional Planning with 2 years of experience in transportation modeling, highway, transit, and multimodal facility planning.
▪ Mr. Michael Moore	Assistant Project Manager & Vice President	B.A. degree in Environmental Science with 23 years of experience in transportation and environmental issues with technical assistance for transportation planning and engineering projects
▪ Mr. Jitender Ramchandani	Planner	Master of Urban Planning degree with 5 years of experience in urban design, transportation and land use planning.
▪ Ms. Mary Ross	Transportation Manager	B.S. degree in Civil Engineer with 20 years of experience in transportation planning and engineering projects including involving corridor studies, travel demand forecasting and transportation impact evaluation.
▪ Mr. Franco Saraceno	Transportation Planner	M.A. degree in Urban and Regional Planning, M.A. degree in Public Administration with 5 years of experience in planning and 3 years of experience in Travel Demand Modeling.
▪ Mr. Myung-Hak Sung	Vice President	B.S. degree in Architectural Engineering with 37 years of experience in transportation planning and Travel Demand Modeling.
▪ Mr. Aaron Quesada	Environmental Scientist	M.S. degree in Environmental Science with 2 years of experience in environmental document preparation, GIS analyses, and graphic design.
BCC Engineering, Inc.		
▪ Mr. Manny Benitez	Vice President	MSCE in roadway and structural engineering design with over 20 years of experience.
Carter & Burgess - Engineering, Architecture and Related Services		
▪ Dr. Reed Everett-Lee	Senior Project Manager	Ph.D. in anthropology with 20 years of experience in planning for transit and multi-modal corridors.
▪ Mr. Vikas U. Jain	Planner (AICP)	M.S. degree in City and Regional Planning with 4 years of experience in developing GIS models for socio-economic, land use, and environmental analysis for transportation planning projects.
Economics Research & Associates		
▪ Mr. Tom Moriatry	President	B.S. degree in architecture with 30 years experience in mixed-use and retail development programming for specialized settings: multi-modal transportation centers and airports, downtown business districts, museums, and resorts.
Edward D. Stone, JR., & Associates		
▪ Mr. Paul Kissinger	Associate Principal	Master in Landscape Architecture degree with 15 years of experience in urban design, waterfront planning, transportation design, community planning and hotel/resort.

Company / Preparer Name	Title	Experience / Expertise
▪ Ms. Swati Khimesra	Associate	Master in Urban Design with 3 years of experience in planning and design of urban related projects.
Glass Kidd & Associates, Inc.		
▪ Mr. Richard R. Glass	President	Master of Public Administration with 21 years of experience in land acquisition, negotiation, closings, relocation, mediation, order of taking, relocation assistance and cost estimating for public and private organizations.
Janus Research		
▪ Ms. Amy Streelman	Preservation Planner/Senior Architectural Historian	Master of Historic Preservation with 9 years of experience in preservation planning.
Jeffrey A. Parker & Associates, Inc.		
▪ Mr. Jeffrey A. Parker	President	B.S.E degree in Finance with 35 years of experience in financial planning for major infrastructure projects.
Edwards and Kelcey		
▪ Mr. Alexander Lu	Planner	M.S.T. degree in Urban Transit Management with 6 years of experience in operations management, schedule planning, freight transportation, and infrastructure project evaluation.
▪ Mr. David Nelson	Associate Vice President	Master in Regional Planning with 26 years of experience in transportation systems analysis and economy.
Transportation Consulting and Government Relations		
▪ Mr. Nick Serianni	President	B.A. degree in Geography/Urban Regional Planning with 30 years of experience in program management, facilitation, and financial and strategic planning for transportation programs and projects.
ZETA-TECH Associates, Inc.		
▪ Mr. Randolph R. Resor	Vice President	B.A. degree and Graduate Study in Transportation with 27 years of experience in railroading and rail rapid transit systems.

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10.1. Federal Agencies

- U.S. Army Corps of Engineers
- U.S. Coast Guard, Seventh District
- U.S. Department of Agriculture, Natural Resources Conservation Service
- U.S. Department of Commerce, National Marine Fisheries Service
- U.S. Department of Interior, Fish and Wildlife Service
- U.S. Department of Interior, National Park Service
- U.S. Department of Transportation, Federal Highway Administration
- U.S. Department of Transportation, Federal Transit Administration
- U.S. Environmental Protection Agency

10.2. State Agencies

- Florida Department of Agriculture and Consumer Services
- Florida Department of Community Affairs
- Florida Department of Environmental Protection
- Florida Department of Transportation – Secretary of Transportation, Central Environmental Management Office, Seaport Office, Rail Office, Public Transportation & Modal Administration, and State Transit Manager
- Florida Department of Transportation District 4
- Florida Department of Transportation District 6
- Florida Department of State
- Florida Fish and Wildlife Conservation Commission

10.3. Regional Organizations

- Saint Johns River Water Management District

- South Florida Water Management District

10.4. County Agencies

- Broward County Metropolitan Planning Organization
- Indian River County Metropolitan Planning Organization
- Martin County Metropolitan Planning Organization
- St. Lucie County Metropolitan Planning Organization
- Miami-Dade County Urbanized Area Metropolitan Planning Organization
- Palm Beach County Metropolitan Planning Organization
- Miami-Dade County Aviation Department
- Broward County Aviation Department
- Palm Beach County Airports Department
- Port of Palm Beach District
- Broward County Port Everglades
- Dante B. Fascell Port of Miami-Dade
- Martin County
- Palm Beach County
- Broward County
- Miami-Dade County
- Miami-Dade County District 11
- Miami-Dade County Public Works Department
- Miami-Dade County Department of Environmental Resources Management (DERM)
- Miami-Dade Expressway Authority (MDX)
- Miami-Dade Transit
- Palm Tran

- Palm Beach County Environmental Resources Management (PBERM)
- Broward County Department of Environmental Protection (BDEP)

10.5. Local Governments

- City of Aventura
- Village of El Portal
- City of Hialeah
- City of North Miami
- City of Miami
- Village of Biscayne Park
- City of Miami Beach
- Miami Shores Village
- City of Miami Springs
- City of North Miami Beach
- City of Dania Beach
- City of Deerfield Beach
- City of Fort Lauderdale
- City of Hallandale Beach
- City of Hollywood
- Village of Lazy Lake
- City of Lighthouse Point
- City of Oakland Park
- City of Pompano Beach
- City of Wilton Manors
- City of Boca Raton

- City of Boynton Beach
- Town of Cloud Lake
- City of Delray Beach
- Town of Glen Ridge
- Town of Hypoluxo
- Town of Jupiter Inlet Colony
- Town of Jupiter
- Town of Lake Clarke Shores
- Town of Lake Park
- City of Lake Worth
- Town of Lantana
- Town of Mangonia Park
- Village of North Palm Beach
- City of Palm Beach Gardens
- City of Riviera Beach
- Village of Tequesta
- City of West Palm Beach
- Town of Jupiter Island

10.6. Other Interested Parties

- Miccosukee Tribe of Indians of Florida
- Seminole Nation of Oklahoma
- Seminole Tribe of Florida
- Overtown Neighborhood Assembly
- Jupiter Inlet District

- West Palm Beach Downtown Development Authority
- Miami Downtown Development Authority
- Fort Lauderdale Downtown Development Authority
- Amtrak
- CSX Transportation
- Florida East Coast Railway
- Florida Inland Navigation District

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11. INDEX

12. APPENDICES

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Appendix B: Environmental Streamlining Agreement/Class of Action Determination

Appendix C: ETDM Programming Summary Report

Appendix D: Cooperating Agency Correspondence

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Appendix F: State Agency Correspondence

Appendix G: Regional Agency Correspondence

Appendix H: Local Agency Correspondence

Appendix I: Resolutions