

CENTRAL **BROWARD** EAST-WEST TRANSIT ANALYSIS



Eastern Terminus TECHNICAL MEMORANDUM

CENTRAL BROWARD
EAST-WEST TRANSIT ANALYSIS
BROWARD COUNTY, FLORIDA

FINANCIAL PROJECT ID NUMBER 411189-2-22-01

FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 4



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OVERVIEW

Purpose

This document describes the methodology and factors used to evaluate alignment alternatives east of I-95 for the Central Broward East-West Transit Analysis. The key elements in the evaluation were availability of right-of-way, adjacent land use, existing geometric constraints, traffic volumes/Level of Service and service to key destinations. Connections to existing and planned transit services were also considered in the evaluation.

Project Description

The study area is in Central Broward County, Florida. Oakland Park Boulevard, the Weston/Sawgrass area, Griffin Road, and the Intracoastal Waterway are the general boundaries of the study area. High levels of travel and congestion on major east/west roadways characterize conditions of this area. Historically, the traditional travel patterns have been directional--eastbound in the morning and westbound in the afternoon--fueled by the residential communities in the west and employment centers in the east. In short, the mobility needs in the study area reflect the amount of travel between west and east Broward County; the congestion on main east/west arteries; lack of connectivity among important transportation facilities including Fort Lauderdale/Hollywood International Airport, Port Everglades, and Tri-Rail; and the amount of travel to significant destinations throughout the Central Broward area.

The technologies under consideration for this study are light-rail transit (LRT) and bus rapid transit (BRT). It is important to note that the Federal Transit Administration (FTA) considers only BRT that operates within its own guideway for a significant portion of the system to be eligible for New Starts funding. Four alignment alternatives or routes were identified for more detailed analysis after the Tier 1 evaluation for the Central Broward East-West Transit Analysis was completed. Two of the alignment alternatives primarily utilize the I-595 right-of-way. The other two alignment alternatives use a combination of east-west arterial streets, Sunrise and Broward Boulevards, with a north-south "connector" of either University Drive or State Road 7 (SR 7). The physical characteristics of the roadways that comprise the alignment alternatives differ, not only from each other, but also along each alignment alternative. Adjacent land uses also vary along the alignments.

Alignments 1, 3 and 4 enter the eastern area along Broward Boulevard at I-95. These alignments would provide service to downtown Fort Lauderdale, including the Broward County Transit Central Terminal, and then proceed south along Andrews Avenue to SE 30th Street, SE 30th Street to US 1, US 1 to the Fort Lauderdale/Hollywood International Airport. Alignment 2 enters the eastern area at I-95 and SR 84. The alignment services the Fort Lauderdale Airport, proceeds to downtown Fort Lauderdale and ends at the Fort Lauderdale Tri-Rail station.

During the Tier 2 evaluation, each of the alignment alternatives were divided into sections, termed "Analysis Units," to facilitate a more detailed assessment. All four of the alignments in the Tier 2 evaluation share a common set of Analysis units east of I-95.

The purpose of this Eastern Terminus analysis is to assess the feasibility of the alignment options within the eastern quadrant of the Central-Broward Corridor. The alignment within this portion of the corridor must effectively provide connections among the key destinations in this area: the Broward/I-95 Tri-Rail station, the Fort Lauderdale central business district and the airport.

Land Use

The eastern portion of the study area is the area bordered by downtown Fort Lauderdale to the north and the Fort Lauderdale/Hollywood International Airport to the south. The east boundary is roughly US 1 and the west limit is roughly SW 4th/7th Avenues.

The land uses in the northern portion of this area are primarily governmental and public institutions, or are office and commercial uses. South, toward the airport, more heavy commercial and industrial uses appear in the area. On the western edge, along SW 4th/7th Avenues, single-family and low-density residential uses predominate, with small civic uses (a school and a park). Strip commercial, with multi-family tucked behind, is located in the eastern section of the area along US 1. The majority of uses along Andrews Avenue are public institutions and commercial, with the Broward County Governmental Center and library, at the northern end of the roadway. Broward General Hospital is located near SE 17th Street. Commercial and industrial uses are located along Andrews Avenue south of the hospital and north of the airport. With access to the courthouse and hospital, SE 3rd Avenue has a similar character to that of Andrews Avenue; however, multi-family residential uses are located nearby and the roadway terminates at SE 19th Street.

Note: Almost the entire area has been designated as a “Regional Activity Center” on the Fort Lauderdale and Broward County Future Land Use maps, allowing a maximum of 5,100 dwelling units but with no maximum limitations on commercial, industrial or transportation uses. Medium density residential is designated on these maps along SW 4th Avenue; a small area of medium-high residential is designated north of SR 84, east of Andrews Avenue; and the commercial land use designation is assigned to properties south of SR 84.

Various north-south roadways exist within this area. The existing roadways that connect from downtown Fort Lauderdale to the Fort Lauderdale Airport are US 1, SE 3rd Avenue, Andrews Avenue and SW 4th/7th Avenues. In addition, the Florida East Coast (FEC) Railway also runs between these two points.

A key natural feature that exists in this area is the North Fork of the New River. This river runs generally east-west and intersects with all of the above-mentioned roadways. The river crossing for US 1 is a four-lane tunnel. The other roadways have four-lane bascule bridge crossings. The South Fork of the New River also crosses all of the corridors. The roadway crossings, however, are fixed, at-grade bridges.

EASTERN AREA SERVICES

Key Generators

According to the Greater Fort Lauderdale Chamber of Commerce, the average annual employment for the Fort Lauderdale region is nearly 570,000 with more than one-third of the jobs existing in the service industry. Retail trade makes up 22 percent of the labor force, while government jobs come in just shy of 14 percent. Jobs in manufacturing, finance, insurance, real estate, construction, education, film production, health care, communication, high technology, agriculture and fishing, and wholesale trade make up the rest of the workforce. Travel and Tourism remains an important industry for the Southeast Florida region and accounts for about an eighth of Florida's economy. For the Fort Lauderdale downtown area, the 2000 employment figure is 27,674, with employment projected to grow nearly seventy percent to 40,496 in 2025.

In addition to the commercial development in the downtown Fort Lauderdale area, a number of key destinations are located within the study area, as shown in Figure 1. They include:

- *Broward County Transit Terminal*
- *Broward County Governmental Center*
- *Broward County Main Library*
- *Broward Center for the Performing Arts*
- *Broward County Courthouse Complex*
- *Broward General Hospital/Medical Center*
- *Fort Lauderdale City Hall*
- *FAU/BCC/FIU Education Complex*
- *Port Everglades*
- *Broward County Convention Center*
- *Las Olas Riverfront Festival Marketplace*
- *Museum of Science and Discovery*
- *Fort Lauderdale/Hollywood International Airport*

It should be noted that Broward County is preparing a plan for the redevelopment of the Broward County Governmental Center. This plan may include the Downtown Transit Terminal. The layout of a new government campus will have an effect on the location of a connector station and the transit guideway.

Existing/Proposed Transit Services

The various existing Broward County Transit routes are shown on Figure 2. The routes, which serve the area south of Broward Boulevard to the Airport and east of I-95, are as follows:

- Route 1 - US 1, SE 3rd Avenue
- Route 11 - East Las Olas Boulevard
- Route 22 - Broward Boulevard (East of Transit Terminal)
- Route 30 - Davie Boulevard, Andrews Avenue
- Route 40 - SE 17th Street, Andrews Avenue
- Route 55 - Broward Boulevard (West of Transit Terminal)

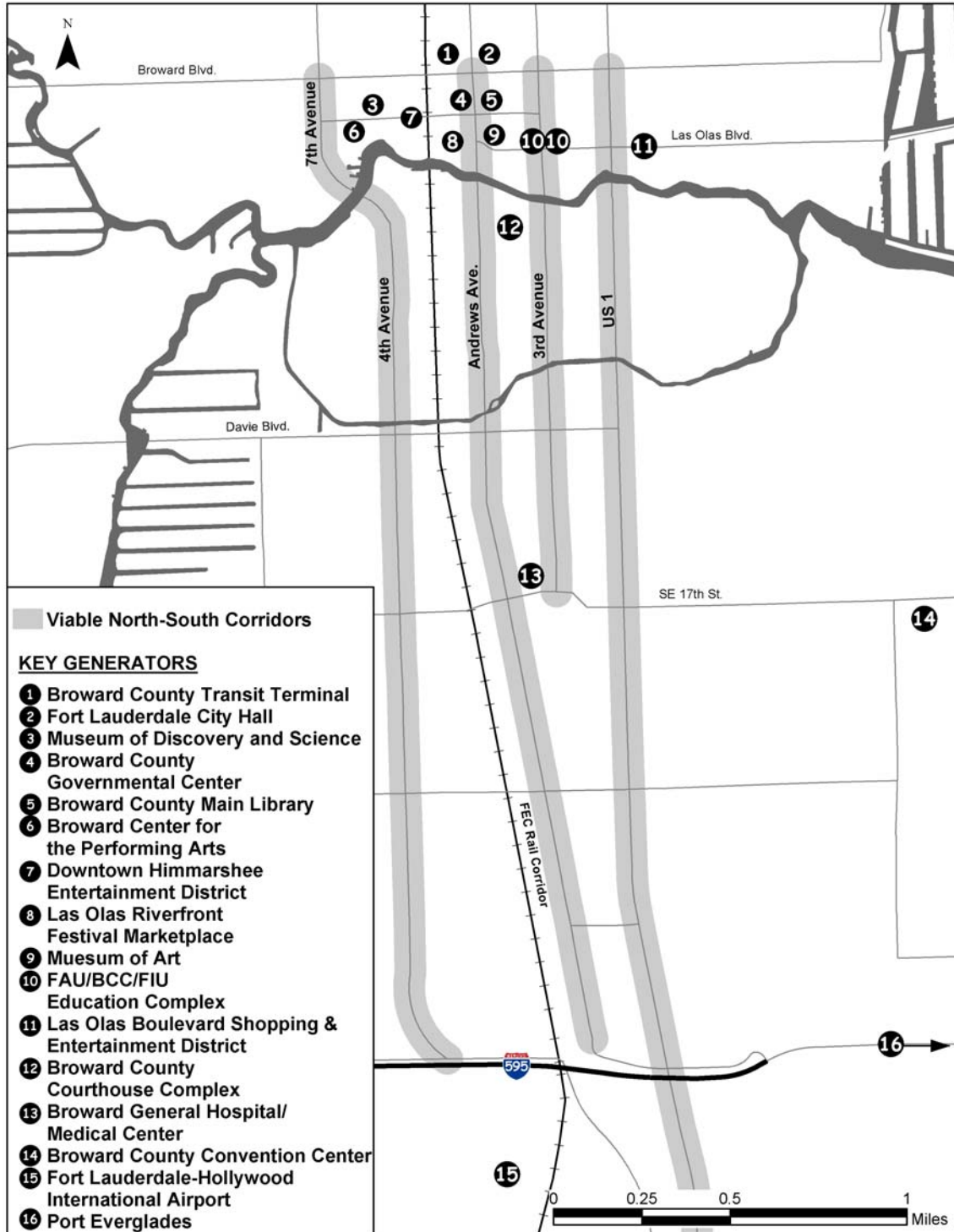


Figure 1
Key Generators
and
Eastern Alignment Alternatives

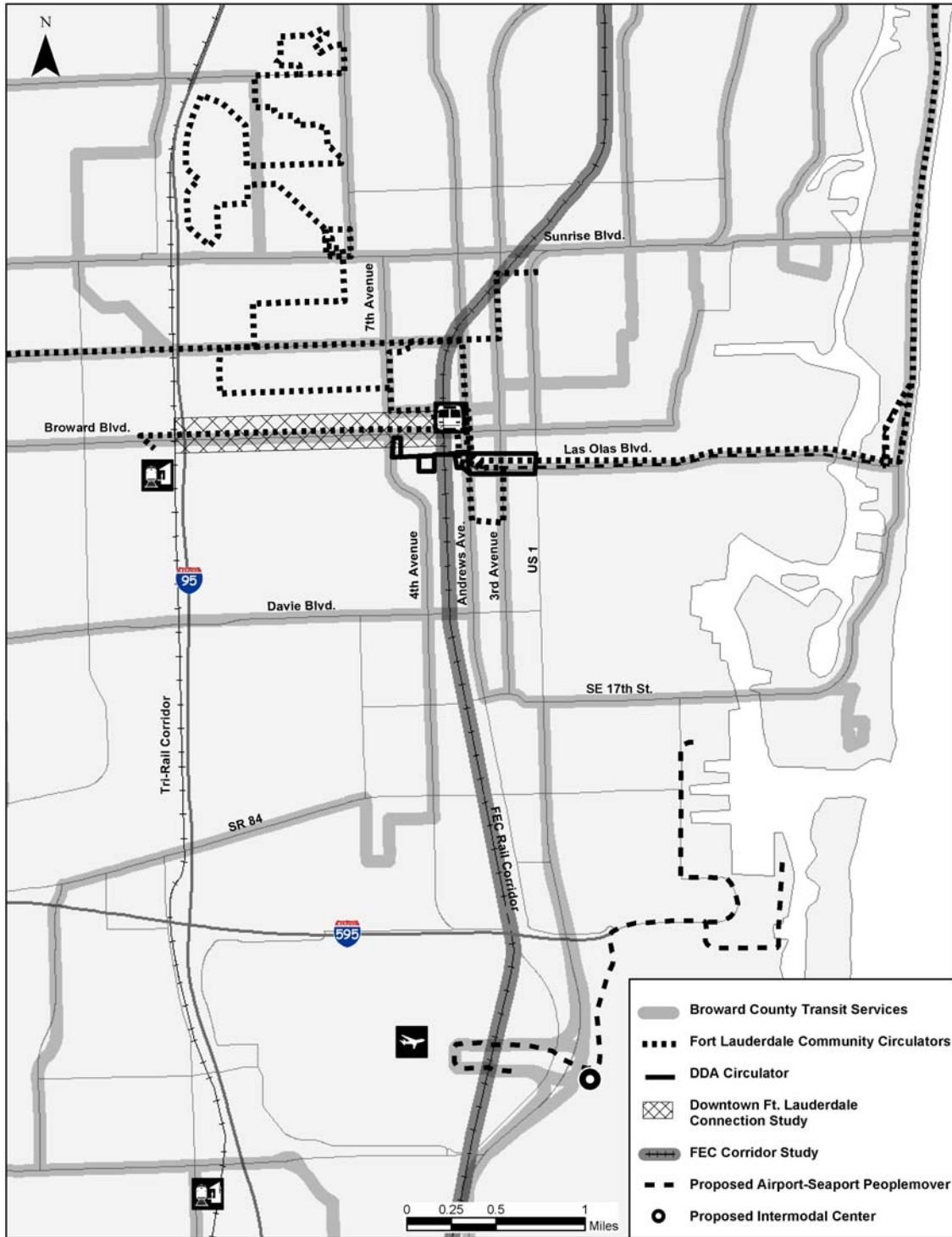


Figure 2
Existing and Proposed Transit Services

- Route 84 - SR 84, SW 4th Avenue

In addition to these services, the Downtown Fort Lauderdale Transportation Management Association operates community shuttles that provide service throughout the downtown area. These shuttles extend to SR A1A to the east and to Sunrise Boulevard to the north. The routes are also shown on Figure 2.

The proposed transit services in the eastern area include the following, which are also shown on Figure 2.

- Airport-Seaport Peoplemover: This will provide a connection between the Fort Lauderdale/Hollywood International Airport and the Port Everglades Seaport. Transfers to this proposed service would occur at the proposed Intermodal Station.
- DDA Circulator: The Downtown Development Authority (DDA) of Fort Lauderdale developed a demonstration project for a pedestrian-oriented transit vehicle that will provide service between the Arts & Sciences, Himmarshee Historic, and Las Olas Riverwalk Districts of Downtown. This shuttle will provide service between the Museum of Discovery and Science at 6th Avenue and US 1, along SW/SE 2nd Street. This demonstration project could link to the Central Broward East-West Transit System at any of the proposed north-south corridors.
- Downtown Fort Lauderdale Connection Study: The Downtown Connection Study addresses the need for a potential link between the I-95 High Occupancy Vehicle (HOV) System and the Fort Lauderdale Central Business District (CBD). The route for this proposed transit service overlaps the eastern alignment the Central Broward East-West Transit System, and may be incorporated into this project.
- FEC Corridor Study: The FDOT is currently evaluating the use of the FEC Railway Corridor as an option for passenger service. The results of this study may impact the future design phases of the Central Broward East-West Transit System.

ALIGNMENT ALTERNATIVES

The four viable options for the Central Broward East-West Transit System are US 1, SE 3rd Avenue, Andrews Avenue and SW 4th/7th Avenues. These roadways, shown in Figure 1, are currently used for travel into downtown Fort Lauderdale. Below is a review of each alignment.

- **US 1**
US 1 is a six-lane divided arterial that runs through all of Broward County. The right-of-way lines are generally at the back of sidewalk.

The land uses along US 1 predominately consist of strip commercial developments, although larger commercial and office buildings also are present. The vast majority of the buildings are adjacent to the US 1 sidewalk, with parking to the side or in the rear.

As previously noted, US 1 crosses the North Fork of the New River with a four-lane tunnel, two fewer lanes than on either side of the structure. The tunnel has a full wall that divides the northbound and southbound roadways. Due to the cost and complexity of adding a light-rail or bus rapid transit vehicle through this tunnel, US 1 was not further evaluated as a possible route for the Central Broward East-West Transit system. The southern portion of US 1 (roughly from the airport to SE 17th Street) could be used in conjunction with other arterial streets (SE 17th Street and Andrews Avenue) to provide a connection between downtown and the airport.

The southern portion of US 1 operates (2002) at Level of Service F between SE 7th Street and I-595 and at Level of Service C south of I-595. US 1 is projected (2025) to operate at Level of Service F for the entire segment. The 2002 and 2025 traffic volumes, in Annual Average Daily Traffic (AADT), and Level of Service (LOS) are given in the following table.

US 1					
From	To	2002		2025	
		Volume (AADT)	LOS	Volume (AADT)	LOS
SE 7 th Street	Davie Boulevard	52,500	F	67,929	F
Davie Boulevard	SR 84	63,000	F	77,533	F
SR 84	I-595	67,000	F	84,408	F
I-595	Griffin Road	48,500	C	55,699	F

Source: "Roadway Capacity Analysis for Years 2002 and 2025", Broward County Department of Planning and Environmental Protection, Transportation Planning Division

- **SE 3rd Avenue**

SE 3rd Avenue is a four-lane roadway with a continuous two-way left-turn lane. Like most other roadways, the right-of way line is generally at the back of sidewalk. Although 3rd Avenue extends north of Broward Boulevard, its southern terminus is a dead-end at a residential section just south of SE 17th Street. As a result, this alignment must be used in conjunction with one of the other parallel alignments, in order to access the Fort Lauderdale/Hollywood International Airport.

SE 3rd Avenue crosses the North Fork of the New River with a four-lane bascule bridge.

The majority of uses along SE 3rd Avenue are public institutions and commercial. The larger facilities include the Florida Atlantic University/Broward Community College at Las Olas Boulevard, Broward General Hospital at SE 17th Street and the Broward County Courthouse south of the New River at SE 6th Street. Several of the smaller commercial and office uses along this alignment are located in converted residential buildings.

SE 3rd Avenue, between Broward Boulevard and SE 17th Street, operates (2002) at Level of Service C and is projected (2025) to operate at Level of Service D.

The 2002 and 2025 traffic volumes, in Annual Average Daily Traffic (AADT), and Level of Service (LOS) are given in the following table.

SE 3 rd Avenue					
From	To	2002		2025	
		Volume (AADT)	LOS	Volume (AADT)	LOS
Broward Blvd	SE 7 th Street	19,800	C	34,764	D
SE 7 th Street	Davie Boulevard	14,500	C	33,360	D
Davie Boulevard	SE 17 th Street	9,400	C	30,642	D
Source: "Roadway Capacity Analysis for Years 2002 and 2025", Broward County Department of Planning and Environmental Protection, Transportation Planning Division					

- **Andrews Avenue**

Andrews Avenue is a four-lane roadway. The cross-section varies for different portions of the alignment. From SR 84 to the vicinity of SE 11th Street, Andrews Avenue has two traffic lanes in each direction and a parking lane on both sides of the street. There is a center, left-turn lane in some areas as well. A few blocks south of the New River Bridge, Andrews Avenue narrows to two lanes in each direction with no parking lanes and retains this cross-section to Broward Boulevard. Due to the change in the cross-section of Andrews Avenue, the only alignment configuration option within this analysis unit is non-exclusive, mixed traffic. There is not sufficient right-of-way for a semi-exclusive, dedicated transit guideway in the area south of the New River Bridge. A transition from a semi-exclusive, guideway (from curb lane to center lane) would require the transit vehicle to cross through-traffic lanes. Removal of on-street parallel parking for a dedicated, transit lane will be evaluated during Preliminary Engineering. At Broward Boulevard the alignment would turn west with a station at the Broward County Transit Central Terminal (on the north side of Broward Boulevard and adjacent to the FEC right-of-way).

Like most other roadways, the right-of way line is generally at the back of sidewalk. While it runs north of Broward Boulevard, the southern terminus is near I-595. As a result, this alignment must be used in conjunction with one of the parallel alignments, in order to access the Fort Lauderdale/Hollywood International Airport.

Andrews Avenue crosses the North Fork of the New River with a four-lane bascule bridge.

The majority of uses along Andrews Avenue are public institutions and commercial, with the Broward County Governmental Center and main branch library, at the northern end of the roadway. The Broward County facilities are part of the proposed Downtown Campus Redevelopment Project, which will be pedestrian oriented and could incorporate a premium transit station. Broward General Hospital is located near SE 17th Street and commercial and industrial uses are located south of the hospital and north of the airport.

Andrews Avenue operates (2002) at Level of Service C between SR 84 and Davie Boulevard and at Level of Service D for all other roadway segments between Broward Boulevard and Eller Drive. Andrews Avenue is projected (2025) to operate at Level of Service F between Eller Drive and Davie Boulevard and Level of Service D from Davie Boulevard to Broward Boulevard. The 2002 and 2025 traffic volumes, in Annual Average Daily Traffic (AADT), and Level of Service (LOS) are given in the following table.

Andrews Avenue					
From	To	2002		2025	
		Volume (AADT)	LOS	Volume (AADT)	LOS
Broward Blvd	SE/SW 7 th Street	19,500	D	35,282	D
SE/SW 7 th Street	Davie Boulevard	17,500	D	33,401	D
Davie Boulevard	SE/SW 17 th Street	18,500	C	37,129	F
SE/SW 17 th Street	SR 84	17,800	C	41,077	F
SR 84	Eller Drive	11,300	D	26,974	F

Source: "Roadway Capacity Analysis for Years 2002 and 2025", Broward County Department of Planning and Environmental Protection, Transportation Planning Division

- **SW 4th/7th Avenue**

SW 4th/7th Avenue is a four-lane divided road that runs from Perimeter Road, at I-595, through Broward County. From Broward Boulevard south to the bascule bridge over the North Fork of the New River, SW 7th Avenue is a four-lane road with a continuous left-turn lane. From the bascule bridge south to SR 84, the roadway becomes four-lane divided with parking. From SR 84 south to Perimeter Road, it is a two-lane roadway.

The land uses along SW 4th/7th Avenues are almost entirely single-family and low-density residential uses, which, because of the low density of potential riders, are inconsistent with premium transit service. Croissant Park Elementary School and Croissant/Davis Park are located on SW 4th Avenue, as is Snyder Park, just north of the airport. The Broward Center for the Performing Arts is on this alignment and patronage of this facility is irregular.

This alignment was removed from consideration due to the incompatible land-uses, its location on the fringe of downtown and the low number of key destinations.

- **Florida East Coast (FEC) Railway Corridor**

Another possible route for the proposed Central Broward East-West Transit system is the FEC Railway Corridor. The assessment and use of this corridor for premium transit is the subject of a separate study to be conducted by the Florida Department of Transportation, South Florida Regional Transportation Authority and the Broward Metropolitan Planning Organization. Should this separate study determine that the FEC Corridor is a viable route, then a further assessment of its applicability for this system will be performed.

It should also be noted that a recent joint ruling (FRA 49 CFR Parts 209 and 211, Appendix A) by FTA and the Federal Railroad Administration (FRA) requires separation of light rail transit operations within “general railroad system” rights-of-way by distance, an FRA-approved crash barrier, or by time (e.g., transit during the day; freight at night). Compliance with this rule could affect the feasibility of implementing transit within the FEC right-of-way.

Summary

The Central Broward east-West Transit Analysis assessed four alternate alignments for the eastern connection between downtown Fort Lauderdale and the Fort Lauderdale/Hollywood International Airport.

- US 1 – Although the alignment has commercial development along the entire route, it actually lies on the eastern fringe of the downtown core, and is over ¼ mile from the majority of the key destinations located along Andrews Avenue. Traffic in this area already exceeds capacity, and the addition of a street running transit service in this area may only increase congestion. Furthermore, the four-lane tunnel under the New River provides some geometric restrictions for a BRT or LRT system. While a portion of US 1 will be needed to access the Airport, it does not appear to be an adequate alignment for the full eastern area.
- SW 4th/7th Avenue – This is a continuous alignment from Perimeter Road at the Airport to downtown Fort Lauderdale. It lies on the western fringe of the downtown core and would not provide an easy connection to the proposed Intermodal Station at the Fort Lauderdale/Hollywood International Airport due to the need to cross the viaduct section of I-595. The land uses along SW 4th/7th Avenue are almost entirely single-family and low-density residential uses. This use is not compatible with a LRT or BRT system. This alignment should be dropped from further consideration at this time.
- Andrews Avenue – This four-lane roadway passes through the center of the downtown core. Most of the key destinations are within one block of the alignment. The land use along the roadway is predominantly commercial. The South Andrews Avenue Redevelopment Plan identifies the corner of SE 17th Street as the ideal location for a transit stop. Except for a narrow stretch north of SE 11th Street, the roadway has a median and/or on-street parking. This provides some public right-of-way to further consider for a separate LRT or BRT guideway.

Andrews Avenue does not connect directly into the Airport; rather, it ends at I-595. The transit system would need to move to US 1 near I-595 so as to connect to the Airport and its planned Intermodal Station. The connection to US 1 should occur south of SR 84 since the distance between Andrews Avenue and US 1 is minimized and the land uses in this area are more compatible with transit service.

- SE 3rd Avenue – This four-lane roadway is located three blocks east of Andrews Avenue. Only two of the key destinations, the Broward County Courthouse and

Broward General Hospital are adjacent to this alignment, although others (the Main Library, the Las Olas Riverfront, the FAU/BCC/FIU campus, the Art Museum and the Riverwalk) are within 1/10 of a mile of this alignment. It is predominantly commercial, although the density decreases south of the Courthouse.

SE 3rd Avenue also does not connect directly with the Airport. It ends in a residential section south of SE 17th Street. Utilizing this alignment would require connecting to US 1 at SE 17th Street, so as to stay adjacent to Broward General Hospital.

- FEC Corridor – Due to its proximity to several key destinations in Downtown, including the Broward County Central Transit Terminal, the Governmental Center, the Himmarshee Entertainment District, and the Las Olas Riverfront, and its potential to conveniently link to the proposed Intermodal Station at the Airport, this potential alignment could serve the eastern area well. However, this railway corridor is currently under study for its feasibility for transit use. This issue is complicated by the joint FTA and FRA ruling requiring the separation of light rail transit operations within the “general railroad system” right-of-way by distance, and FRA-approved crash barrier, or by time. Until such time as this corridor is determined to be acceptable for transit use, it cannot be considered a viable alignment alternative for the Central Broward East-West Transit System.

Based on the assessment of the four viable alignments, Andrews Avenue has the best potential as a premium transit corridor. It travels through the downtown core, is nearest to the key destinations, has appropriate existing land uses and some flexibility within existing right-of-way. While crossing the New River on a bascule bridge is a challenge for most of the alignments, the possible redevelopment of the downtown Broward Governmental Center could provide an opportunity for an integrated guideway and separate river crossing. The exact guideway alignment will be developed as the transit technology is finalized and these redevelopment plans are refined.