CENTRAL BROWARD TRANSIT
DRAFT ENVIRONMENTAL IMPACT STATEMENT
Evaluation of Scoping Options Report

April 2010

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CENTRAL BROWARD East West TRANSIT STUDY

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Introduction

The Florida Department of Transportation, in cooperation with the Federal Transit Administration (FTA), initiated an Environmental Impact Statement (EIS) for the Central Broward East-West Transit Analysis (the Study) with a scoping process in September 2008. An extensive public and agency review process has been conducted to engage stakeholders and leadership of Broward County to review and identify:

- Technical study needs and issues relative to the project alternatives and alignment configurations;
- Additional alternatives for consideration; and
- Local preferences in defining the purpose and need for the project.

During Scoping, recommendations were made in consultation with the Federal Transit Administration (FTA) and by Scoping participants, that additional screening for alternative alignment options and technology was needed. This additional "Evaluation of Scoping Options" was added to gain broader input from stakeholders and the general public concerning the final alternatives to be carried forward into the Environmental Impact Statement. The goal of Evaluation of Scoping Options was to refine and select alternative(s) consisting of both alignment and technology that would garner support prior to expenditure of time and monies for a detailed study of those alternatives in the EIS.

An environmental analysis is conducted for all federal undertakings in accordance with the National Environmental Policy Act (NEPA) and is a phase of the transportation planning process necessary to promote efforts to protect the environment and ensure that available federal resources are used in the most prudent and effective manner. In the case of the Central Broward East-West Transit Analysis, the potential for significant impacts would warrant an EIS. Public involvement is an integral and ongoing component of this process. The level of analysis conducted for an EIS considers fewer alternatives in more detail for a wide range of potential effects and user benefits. Alternatives include No Build and Transportation Systems Management (TSM) options in addition to reasonable build alternative(s). Evaluation of Scoping Options conducted for this draft EIS re-examined the Locally Preferred Alternative (LPA) previously identified to fully explore refinements and additional options to determine the most promising build alternatives to be studied in more detail. This is an important step in developing a set of alternatives with the greatest potential to garner federal New Starts funding.

New Starts is a highly competitive process that awards 50% or more federal funding to projects that exhibit the most user benefits in the most cost effective manner. Local funding is an important component of project eligibility and project sponsors who provide more than the 50% local match required have a greater chance of being funded. Other federal funding program options exist, namely Small Starts and Very Small Starts, which may be appropriate for the level of investment proposed at the conclusion of the Study. The financial plan prepared as part of this EIS will examine funding options for the Preferred Action recommended at the Study conclusion and ultimately adopted by Broward County and the Broward Metropolitan Planning Organization (MPO).

This report documents the conduct and conclusions of the Evaluation of Scoping Options phase. This additional phase was recommended during the scoping process for the Study.

Project Development

The Study was initiated in response to recommendations from a series of planning activities over the past decade. The primary purpose of today's Study is to provide a reasonable solution to a persistent and worsening problem with east-west travel in Central Broward County. The first look at the feasibility of a premium transit solution emerged from the I-95/I-595 Master Plan Study conducted in mid-2001. The highway improvements recommended by the Master Plan are now being implemented. However, the highway improvements alone are not expected to address the full extent of the mobility problems in the corridor. In addition to the highway improvements now underway, the I-95/I-595 Master Plan recommended an Alternatives Analysis be conducted to determine the full range of transit alignments and technologies, land use requirements and economic development potential.

The Alternatives Analysis (AA) was completed in November 2004 and was conducted in accordance with the FTA New Starts process in order to maintain project eligibility for federal funding. Community involvement and agency coordination was an important element of the process in order to ensure public acceptance of the project and its local financial commitment requirements. The alternatives developed from the AA were screened for potential environmental issues to be further studied in the environmental impact analysis. Examination of potential environmental effects from the project at the AA stage of review is to determine if any alternatives should be ruled out early on in favor of more promising alternatives, and to compare the trade-offs of benefits and drawbacks among alternatives.

A recommendation for an LPA was made at the conclusion of the AA and on April 14, 2005, the MPO approved the LPA for Light Rail Transit. At the time of approval, conditions were placed on the LPA requiring that alternative alignments be examined for the segments along 136th Avenue in Sunrise, State Road 7 and Broward Boulevard to address community concerns.

Since that time, alternative alignments have been reviewed with the community and adjustments were made to shift the alignment from 136th Avenue into the Sawgrass International Corporate Park south of Sunrise Boulevard and refinements for the connection to the terminus at the Bank Atlantic Center. On June 8, 2006, the MPO formally approved the modification to the western terminus and the alignment shift from 136th Avenue.

In the intervening period, further alignment refinements were reviewed concerning elevated or mixed traffic segments north of I-595 on State Road 7 and Broward Boulevard going into downtown.

A Notice of Intent to conduct an Environmental Impact Statement for the Central Broward East-West Transit Analysis was issued on September 2, 2008. This notification was published in the Federal Register to kick off another round of public and agency meetings to further examine the purpose and need for the project and review the LPA, now refined on the western terminus. Questions still remained among stakeholders upon initiation of this Scoping process concerning alignment and technology selection. Additional review was recommended to determine whether additional refinements and alignments were needed or desired, and that review is discussed in this report.

Evaluation of Scoping Options was then conducted to define viable east-west transit alternatives to single-occupancy vehicles that would improve transit capacity and connectivity and alleviate traffic congestion. This year-long process has been accessible to the public through public meetings, workshops and electronic media. Excellent participation from the Technical Advisory Group (TAG) exhibits stakeholders' interest in mass transit solutions in this study area. The review of both alignments and technology has been thorough and open to suggestions from the general public as well as municipalities and elected officials.

The MPO has also identified the need for improved mobility in the Central Broward Corridor through its long range planning processes for the last decade. The most recent 2035 Long Range Transportation Plan (LRTP) prioritizes premium transit (high capacity and rapid bus) and a new concept of Mobility Hubs (places where people meet transit connections) in the mix of transportation solutions. The concept of Mobility Hubs that has emerged from this plan is compatible with a fixed guideway system and supports potential joint development in transit oriented development and transit oriented corridors. Innovative funding strategies are now being discussed that would support the possibility of a premium transit solution in the Central Broward East-West Study Area and is specifically included in the 2035 Cost Feasible Plan, known as "Transformation."

Regional Planning Context

Current Regional plans were reviewed and considered during the Evaluation of Scoping Options process. They are consistent and supportive of the Central Broward East-West Transit Project. Transportation planning studies are also underway for three projects which focus on serving north-south travel needs. These include:

- South Florida East Coast Corridor Study;
- Downtown Fort Lauderdale Streetcar (the Wave); and
- Sunport Airport/Seaport People Mover.

The Central Broward East-West Transit Study is the only study addressing east-west travel in Broward County. Having an east-west link is critical to ensuring success for other systems and services, including local bus.

South Florida Regional Transportation Authority (SFRTA) Strategic Regional Transit Plan

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

South Florida East Coast Corridor Study

In the Phase I Final Conceptual Alternatives Analysis it is stated that the South Florida East Coast Corridor "would link with existing and planned local systems such as trolleys in Boynton Beach, Lake Worth, downtown West Palm Beach, Miami Beach, Miami and Fort 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 Miami Intermodal Center." Current candidate station areas for the South Florida East Coast Corridor include the Fort Lauderdale-Hollywood International Airport and the Fort Lauderdale Government Center, both of which would connect with the Central Broward East-West Transit Project.

Broward MPO 2035 Long Range Transportation Plan

Broward County recently completed the update to the LRTP for 2035. This plan represents a paradigm shift compared to previous plans in that it sets the framework for a more balanced and forward thinking system of many transportation modes, and balances levels of investment among modes. This balance provides more investment for transit and opportunities to move around Broward County other than by single-occupant vehicle travel. Priority spending for transit, bicycle, pedestrian, and smart-growth policies, which integrate transportation with land use are the hallmark of the current plan.

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

Broward County Comprehensive Plan Transportation Element

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

Broward County Transit Development Plan

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

I-595 Public-Private Partnership Project (PPP) Development

The Central Broward East-West Transit Project has been coordinated with the design team of the I-595 highway improvements to include a transit envelope within the design for the I-595 reversible lanes reserving right-of-way to accommodate potential future transit options currently under evaluation. The process to examine potential transit options emerged from the I-595 Master Plan. An express/limited stop bus service operating in mixed traffic along I-595 is scheduled for roll-out by Broward County Transit in September 2010. The alignment for this new service is consistent with the study area. The service provides a transportation alternative that may help alleviate traffic congestion during construction which is scheduled for completion in spring 2014.

South Florida Regional Planning Council SR 7 Collaborative

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

The Downtown Development Authority's Streetcar – the Wave

In 2004, a downtown transit and pedestrian mobility study identified the need for transit and pedestrian improvements in downtown Fort Lauderdale. This in turn, led to studies to identify a

potential route and technology and assess potential environmental impacts associated with completing a high capacity premium transit improvement. In 2008, a Locally Preferred Alternative (LPA), which extends from North 6 Street on the north to Southeast 17 Street on the south, was endorsed by Broward County, the City of Fort Lauderdale, and the Downtown Development Authority. Dubbed "The Wave", this streetcar system will provide 10 stations and will serve as a local circulator in downtown Fort Lauderdale. This service will provide a number of opportunities for direct connection to the Central Broward East-West Transit Project.

Broward County Sunport PD&E Study

The Sunport, the Airport/Seaport People Mover was established in the Broward County 2020 Vision Plan, which outlined a framework for future development at the Fort Lauderdale-Hollywood International Airport and elements that would promote regional transportation and transit improvements. The People Mover was further examined in a feasibility report in 2004, which identified operational issues and financial feasibility for the proposed system (and corridors). The Sunport Study area limits are Southeast 17 Street to the north, airport access roads (north of Griffin Road) to the south, the South Florida East Coast Corridor to the west, and Port Everglades to the east. It is envisioned that the People Mover will provide additional and effective transportation capacity between the regional transportation network, the Airport and the Seaport. A possible future Broward Intermodal Center could also serve as a transfer point between the People Mover and the various elements of the regional transportation network, including integration with the Central Broward East-West Transit Project. A map of the regional plans and systems can be found in Appendix A.

Description of Corridor/Study Area

The study area is located in Broward County, Florida. The corridor boundaries of the study area are in the central part of Broward County, bounded generally by Oakland Park Boulevard to the north, the Sawgrass Expressway/I-75 to the west, Griffin Road to the south, and the Intracoastal Waterway to the east.

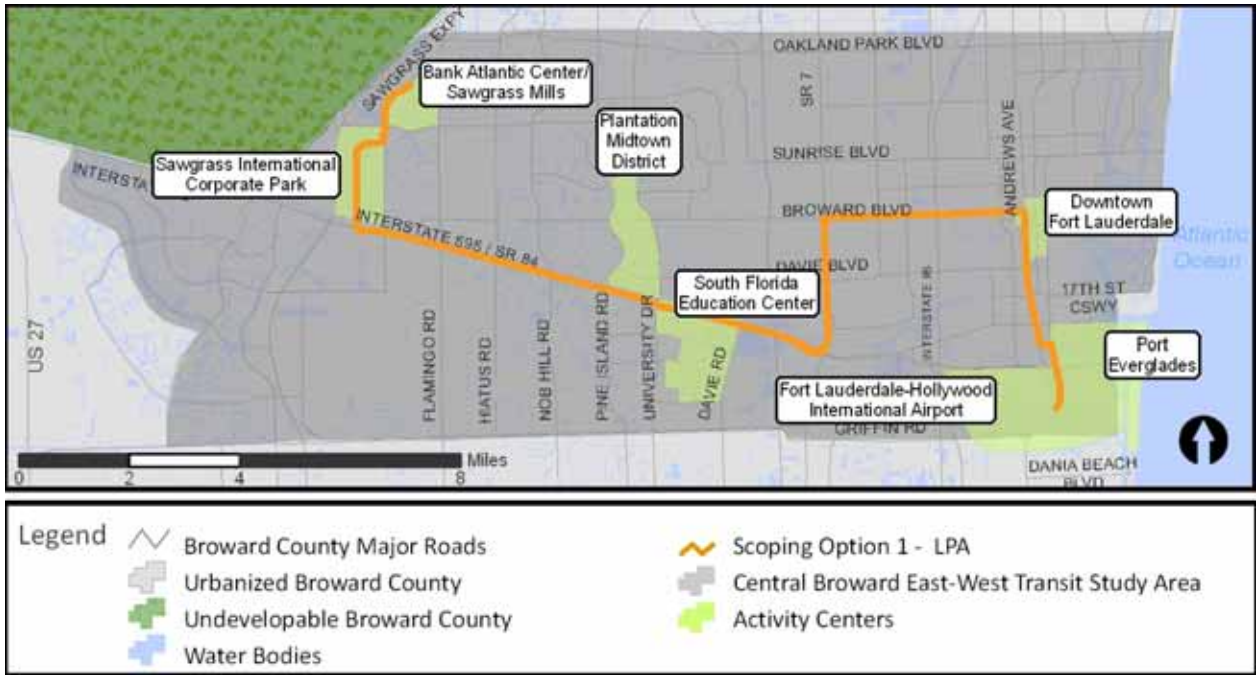
The project corridor extends from its western terminus at the Sawgrass Mills/Bank Atlantic Center in western Broward County to the Fort Lauderdale-Hollywood International Airport in eastern Broward County. The adopted LPA alignment begins at the Bank Atlantic Center, south through Sawgrass International Corporate Park to Interstate-595 to the east, then north via State Road 7 to Broward Boulevard, then east along Broward Boulevard to Andrews Avenue where it continues south through downtown Fort Lauderdale and to its eastern terminus at the Fort Lauderdale-Hollywood International Airport. The LPA is 21.5 miles in length and passes through a number of major activity centers, namely:

- Sawgrass Mills/Bank Atlantic Center;
- Sawgrass International Corporate Park;
- Midtown Plantation;
- South Florida Education Center (SFEC);
- Downtown Fort Lauderdale;

- Port Everglades; and
- Fort Lauderdale-Hollywood International Airport.

Exhibit 1 shows the study area and the LPA alignment which served as a reference for Evaluation of Scoping Options.

Exhibit 1: Study Area and Locally Preferred Alternative



Study Initiation

Problem Statement

Central Broward County is bordered by the Atlantic Ocean to the east and the Everglades to the west. The ability to add more highways is physically limited and transit alternatives are sought as a means of addressing population and employment growth and the expected development needed to accommodate this growth. Density is high for most cities within the study area, relative to the average for Broward County, as of the 2000 U.S. Census. Exhibit 2 shows these densities compared to other U.S. cities.

Exhibit 2: Population Density Comparison

	City	Population Density (persons/sq mi)
Cities within the Central Broward East-West Transit Analysis Study Area	Fort Lauderdale, FL	4,803
	Plantation, FL	3,815
	Davie, FL	2,265
	Sunrise, FL	4,712
	Lauderhill, FL	7,893
Other U.S. Cities	San Diego, CA	3,772
	Denver, CO	3,617
	Portland, OR	3,939
	Las Vegas, NV	4,222
	Dallas, TX	3,469
	Atlanta, GA	3,161
	Chicago, IL	12,750
	Boston, MA	12,165
	New York, NY	26,402

Source: U.S. Census 2000 Summary File

Density is expected to increase with growth in population, given the fact that Broward County is nearing build-out and has limited areas for new development. Future land use and development patterns show a concentration of higher density residential, commercial, and institutional uses along the Central Broward alignment which is favorable to transit supportive development along the corridor. As land values increase, the cost of parking is also anticipated to increase the cost of travel by single-occupant vehicles. A comparison of the density in 2005 with projected density as of 2035 within the region is shown for both population and employment in Exhibits 3 and 4.

Exhibit 3: Population Density (persons per acre)

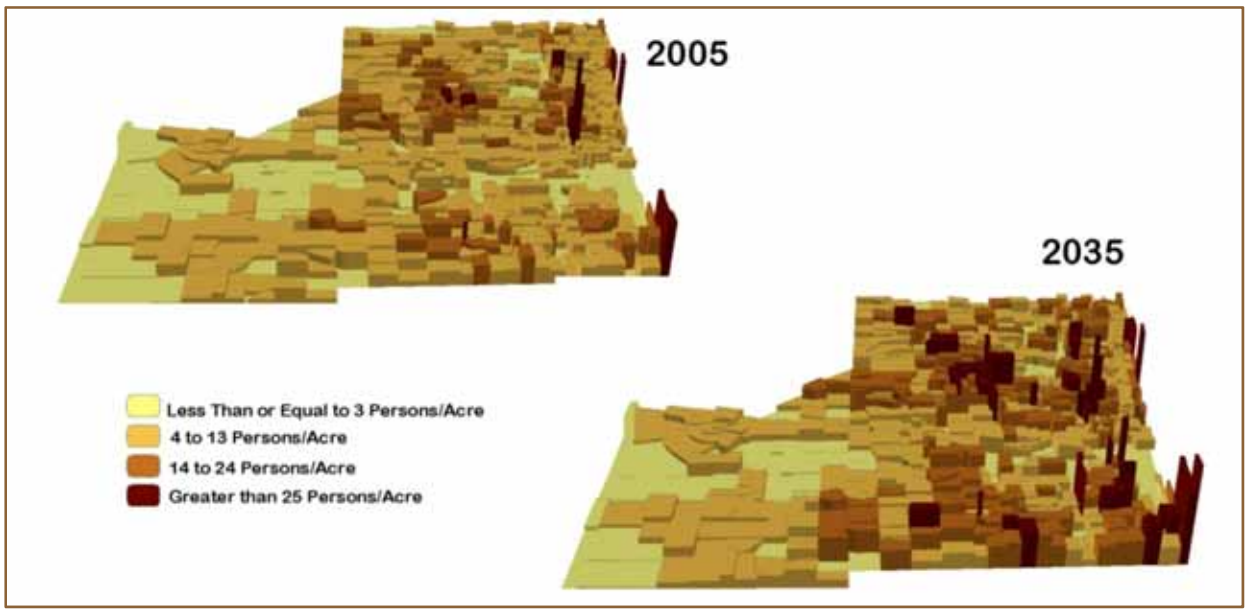
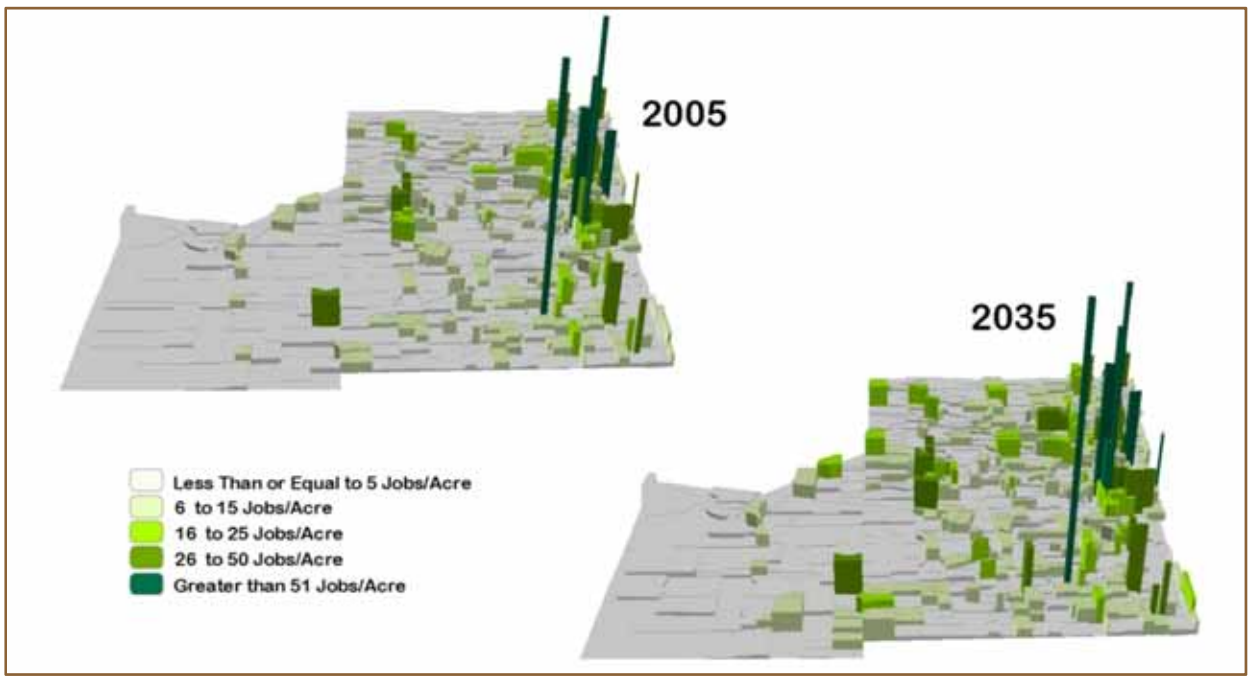


Exhibit 4: Employment Density (jobs per acre)



Interstate 595 (I-595) serves the majority of the east-west travel demand in the corridor. It opened to traffic in 1989 as the only limited-access east-west freeway in Broward County. It connects the developing residential suburbs in the western portion of the county to downtown Fort Lauderdale, the airport / seaport area and I-95, the north-south transportation spine for southeast Florida. The result has been a heavily congested corridor suffering from deteriorating reliability and safety.

Traffic volumes experienced on I-595 in 2005 range from 142,800 to 197,000 per day. Slow-moving traffic is common for eastbound travel in the morning peak hour and westbound travel in the evening peak hour. These patterns are evidence of the growing residential communities in the west and employment centers in the east.

Travel demand on I-595 is expected to exceed 300,000 vehicles per day by 2024 (Project Development & Environmental Study, March 13, 2006). A master plan created for the I-595 corridor includes the addition of tolled reversible express lanes, which will consume the remaining right-of-way, while still not meeting the anticipated travel demand. The existing transportation system in the corridor cannot accommodate continued growth in vehicular demand without extensive condemnations, therefore alternatives to the traditional freeway system were recommended for further consideration and study.

Over the past decade, an increasing acceptance has developed among stakeholders that the only way to accommodate travel demand associated with continued growth in central Broward County and its economy is to provide high-speed, high capacity, and reliable transit service. In 2002, the Central Broward East-West Corridor Transit Alternatives Analysis was initiated to address the issue.

Purpose & Need

The overall purpose and need for the Central Broward East-West Transit Analysis is to address the rapid growth in the western section of Broward County and resultant traffic congestion on east-west facilities in central Broward County. The LPA that was recommended as a result of the AA was developed to improve east-west mobility in Broward County in a way that met the following transportation needs:

- Projected population and employment growth anticipated by year 2030;
- Presence of the County's largest trip generators within the study area;
- Increased development densities that are projected to be 25% higher in the study area;
- Increased travel demand and congestion resulting from anticipated growth;
- Limited expansion capacity (based on availability of right of way) on existing east-west roads operating at capacity (I-595, Oakland Park Boulevard, Sunrise Boulevard, and Broward Boulevard);
- Limited transit service options as a result of right-of-way limitations, and;
- Projected degradation of air quality resulting from increased congestion.

The introduction of premium transit to the corridor would offer an alternative means of travel for the growing number of residents, employees, and visitors in Broward County and would improve mobility throughout the region. The project would support continued economic growth and development along the corridor, and would provide a mobility option currently unavailable in the corridor. Moreover, the increased mobility in the corridor with fewer numbers of vehicles should help to reduce future increases in vehicle miles traveled (VMT) and vehicle emissions.

This purpose and need statement was prepared using 2030 projections from the LRTP in place at that time. The recently adopted 2035 LRTP further supports the purpose and need for this project based on year 2035 socioeconomic data. The EIS will be compared to a horizon year of 2035 consistent with the currently adopted LRTP and in accordance with FTA's final guidance on New Starts dated September 2, 2009.

Goals and Objectives

The goals established for the Central Broward East-West Transit system are supported by the 2035 LRTP. Project goals established to meet the defined purpose of the project are listed below.

- Improve east-west mobility in Broward County in a way that is feasible in terms of engineering and public acceptance.
- Minimize environmental impacts.
- Be cost effective relative to other systems currently funded.
- Ultimately be eligible for federal funding.

The goals and objectives of the project also reflect the FTA New Starts evaluation criteria, as FTA approval is required for the project to advance to the Preliminary Engineering phase. This approval will be based on the project's performance under New Starts criteria. Therefore, the alternatives will evaluate mobility improvements, cost effectiveness, transit supportive land use policies, and future land use patterns. These evaluation measures are also consistent with federal guidance for the NEPA process. Each alternative was evaluated using measures that correspond to project goals and objectives. This study's specific goals and objectives are detailed in Exhibit 5 which follows.

Exhibit 5: Goals and Objectives

Goals	Objectives
Travel and Mobility: Enhance east-west mobility in Central Broward County.	Select an alternative that maximizes "system user benefits" as defined by the Federal Transit Administration, essentially, providing the greatest, overall travel time savings in the corridor.
	Select an alternative that provides the highest level of accessibility (connects the greatest number of major destinations, such as employment nodes, and activity centers including downtown Fort Lauderdale, the South Florida Education Center, and Sawgrass International Corporate Park, and Fort Lauderdale-Hollywood International Airport).
	Select an alternative that has high ridership potential.
Financial and Economic: Efficiently use available financial resources, and support economic growth and development.	Select an alternative that is cost effective in terms of capital cost and operating cost.
	Select an alternative that can be operated efficiently in terms of annual operating cost per passenger mile.
	Identify the appropriate local implementing agency.
Community: Be consistent with the needs and desires of the residents of Broward County, in order to maximize community acceptance and support.	Select an alternative that will be endorsed by the municipalities that it will serve.
	Select an alternative that will be endorsed by community organizations.
	Select an alternative that is compatible to the greatest degree possible with the multiple transit planning and system plans being developed in the area.
Land Use: Ensure compatibility between land use policies and transit service so that the need for trip-making and the amount of travel is reduced and the opportunities for transit oriented development are maximized.	Coordinate the "premium transit" improvement with existing and planned development and the growth of Broward County in an efficient and sustainable way.
	Identify transit supportive land use policies that are in place in the corridor and affected municipalities.
	Identify transit supportive land use policies that need to be implemented in the corridor and affected municipalities.
Environmental: Enhance and preserve the social and physical environment, and keep potential impacts to sensitive resources to a minimum.	Select an alternative that maximizes environmental benefits including reducing greenhouse gas and ozone precursor emissions.
	Select an alternative that has minimal negative impact on sensitive resources such as noise receptors, wetlands, and historic resources.

Public Involvement

Public involvement throughout the Study has been continuous and comprehensive. Following consultation with the Federal Transit Administration in June 2008, it was determined that various outreach efforts would be needed for an adequate amount of public input. Several methods were used to provide stakeholders and the public with information and with the opportunity to provide comments. Out of those public involvement activities, a series of milestone events have taken place with respect to alternatives considered.

Scoping Meetings

In the fall of 2008, a series of Scoping meetings were held for the Central Broward East-West Transit Analysis (Study). The purpose of the Scoping meetings was threefold:

1. Present the purpose and need, goals and objectives, corridor alternatives, environmental issues to be considered and the proposed new public involvement program to public agency representatives and the general public;

2. Provide an opportunity to receive comments so that those concerns and issues raised by the public and other stakeholders were reflected in the development and evaluation of alternatives to be considered in the EIS, and;

3. Provide an opportunity for all reasonable options to be presented by the public and agencies.

Critical information received at the Scoping meetings included the identification and "voting" on the alignments, which led to a clearer understanding of the preferences of the community, as well as the addition of two alternatives including (a) 136 Avenue to Broward Boulevard and (b) I-75 to I-595 to the Hollywood-Fort Lauderdale International Airport. It was also determined through the Scoping process that focus groups should be used to better gauge public sentiment about public transportation. (See Scoping Summary Report, March 2009)

Focus Groups

In the spring of 2009, a series of focus groups took place in an effort to gather information about the public's attitude about the transit system and technology itself, why the public feels the way they do, and better ways to get the public involved in the decision-making process. Because previous public outreach attempts provided inconsistent results and did not adequately engage public participation, the study team agreed that a different approach would be needed for the next phase of this Study.

To meet the research objectives, focus groups spanned both geographic and demographic categories, including persons from the various municipalities within the study area, senior citizens, students, business owners, and other groups. Each focus group had between seven and nine participants, and reflected a mix of gender, household income level, and ethnic background. Each focus group, led by an impartial facilitator, began with a query of participant usage, perceptions of mass transit, and propensity to use mass transit. Participants then engaged in activities to create their ideal mass transit system for their area. The moderator probed for certain elements in the activity, including appearance of system, type of vehicle, whether the system be elevated or at-grade, stations, safety, cost, and schedule. The moderator also discussed various funding options and asked participants to identify

where they thought the funding should come from to pay for a new premium transit service. The focus groups ended with exploration of their favored means of study-related communications and public outreach initiatives.

Focus Group Results

It was determined that, with the exception of the transit dependent population, most of the participants drive personal vehicles to meet their transportation needs. Most participants believed that public transportation in Broward County offers limited options, does not keep pace with the growing needs of the population, and could stand improvement or redesign. Users and non-users agreed that public transportation adds vitality and other benefits to geographic places in terms of:

- Ease of getting from place to place;
- Access to points of interest;
- Tourism;
- Socialization;
- Having less traffic congestion;
- Having less pollution / being more eco-friendly; and
- Job creation.

Across all focus groups, participants were receptive to a new system and agreed that changes to public transportation in Broward County are needed. Most participants imagined an electric vehicle or a light rail transit (LRT) system supported by a feeder bus system. While the participants were given the opportunity to select any geographical area for their ideal mass transit system, nearly all participants developed a system that encompassed all of Broward County. Ideas generally emphasized the importance of connecting eastern Broward County to western suburbs as well as other outlying areas, using an elevated structure or express system to reach major roadways, points of interest, downtown areas, the airport, and beaches, which networked with a feeder system (generally of buses) to support more local / commuter stops. (See Focus Group Summary Report, August 2009)

Technical Advisory Group

The Technical Advisory Group (TAG) was a direct result of the FTA recommendation for a more extensive public involvement program. It was established to form a group that would be engaged in the Study while not duplicating the MPOs Technical Coordinating Committee participation. The TAG also provides a forum to help build consensus for the project. TAG members are invited to be a part of the environmental process and help address technical issues associated with the Study. During Evaluation of Scoping Options TAG members were asked to review project information and provide input and technical guidance. The group is comprised of professionals from each jurisdiction in the study area, resource agencies, representatives from the study area activity centers, and non-profit / community organizations. TAG members were also asked to participate in public outreach efforts by hosting workshops in their own jurisdictions to disseminate information about the project.

Participation (by agency) at each of the first three meetings held during the Evaluation of Scoping Options process is shown in Exhibit 6.

Exhibit 6: TAG Members and Attendance to Date

Invited	In Attendance		
Agency	TAG Meeting #1	TAG Meeting #2	TAG Meeting #3
Area Agency on Aging			
Broward College	Y	Y	Y
Broward County	Y	Y	Y
Broward County Transit		Y*	Y
Broward County Transit			
Broward MPO	Y	Y	Y
Citizens for Improved Transit	Y*	Y*	Y*
City of Dania Beach	Y	Y	Y
City of Fort Lauderdale		Y	Y
City of Lauderdale Lakes		Y	Y
City of Plantation	Y*		
City of Sunrise		Y	Y
FDOT Design			
FDOT Office of Modal Development			
Fort Lauderdale Downtown Development Authority		Y*	Y*
Plantation Gateway 7			
Sawgrass International Corporate Park		Y*	Y*
South Florida Education Center	Y	Y	Y
South Florida Regional Planning Council		Y	Y
South Florida Regional Transportation Authority			
Town of Davie	Y	Y	Y
FAU		Y	Y
City of Lauderhill			Y
FAU		Y	
TOTAL:	8	16	16

*Viewed online
Note: During the voting process, only one vote was given to each agency.

It is anticipated that the TAG will continue to assist in reaching consensus on a number of issues including station area siting and planning, environmental priorities, and ultimately endorsing both the recommended Preferred Action and determination of the Initial Operating Segment. To date, the TAG has contributed to the Study by helping prioritize (rank) technical criteria analyzed during Evaluation of Scoping Options, which led to the narrowing of the nine options and endorsement for Build alternatives for further review and study. For further information regarding the evolution and definition of the alternatives, see the "Development and Definition of Alternatives", page 23.

Additional Outreach

It was determined that other outreach efforts would be needed for an adequate amount of public input into the development of the draft EIS. This section provides descriptions of additional efforts to enhance the public outreach effort for the Study.

Public Workshops

A total of three workshops were conducted within the study area. The top four ranked alignments from the TAG review and technical evaluation results were brought to the public to gain feedback via a voting exercise. The workshops were conducted in an open house format with a scheduled presentation to inform participants about the Study process, evaluation results for the options being considered and possible technologies. Each participant was asked to vote for and/or veto one of the four alignments, and then separately, indicate a preference for a technology, either LRT or BRT.

Additional public workshops will be conducted as the Study progresses into the conceptual design and detailed environmental impact assessment process. The remainder of these workshops will be held to provide information to the public and solicit comments and opinions at critical milestones of project development and identify issues and possible mitigation measures appropriate for each geographical sub area for the project.

Issue Based Forums

A number of issue based forums have taken place or are planned throughout the study area. The purpose of these forums is to broaden participation by meeting with smaller groups or organizations that were either unable to attend one of the larger public workshops, or that represent a group with a common interest or geographic area, such as a home owner association. In an effort to reach more people and gain additional input from more potentially affected groups, issue based forums are brought to the group's location of choice, typically a regularly scheduled meeting.

At each issue based forum during Evaluation of Scoping Options, a brief presentation is made about the project. As with the public workshops, the Study team discusses the project and presents the four alignments and two technology choices and ask participants to express their preferences for or objections to each. Preferences for alignment and technology gathered at the meetings will be shared with stakeholders and local leadership. Over 50% of the public has expressed a preference for the Modified LPA alignment (I-595/SR 7Broward Blvd) and 70% have expressed a preference for light rail transit. (See "Final Refinement and Selection of Alternatives", page 50 for breakdown of all input received.)

Website

The project website, www.centralbrowardtransit.com, provides detailed information, including past studies, present status, and future opportunities. Aside from providing news, status of the Study, and a

library of reports prepared to date, the website provides information on the many ways for the public to get involved and have input in the project.

The website provides opportunities to comment on any aspect of the project, and requests volunteers to be a part of one of the working groups during the next project development phase. There are also multiple surveys including one in which the public can vote on the alignment and technologies, mirroring the workshops and issue based forums, thereby providing another venue to provide comment on Evaluation of Scoping Options results.

Newsletters

The fall 2009 newsletter provided detailed information about the project, including a project update which detailed the Evaluation of Scoping Options process including the alignment and technology choices. It also provided information about the public workshops, the project website and invited participation in the Study.

Continuing Public Outreach

Additional outreach will continue throughout the conduct of the Study in the form of working groups, stakeholder presentations and meetings, and community forums. The Public Involvement Plan, updated September 2009, provides detail on the activities and methods for engaging potentially affected parties.

Development and Definition of Alternatives

The Alternatives Analysis conducted between the years 2002 and 2006 considered a number of alignments to address the mobility needs for east-west travel within the study area that led to the adoption of an LPA. During Scoping for the current Study, initiated in September 2008, the range of alternatives was revisited to determine whether the LPA still met the project purpose and need and to identify any additional alternatives that warranted consideration.

Evaluation of Scoping Options in 2009 was conducted to define the Build alternatives for detailed assessment in the EIS. In addition to the Build alternatives, a No Build Alternative and a Transportation Management Systems Alternative will serve as baseline conditions for comparison of environmental effects and calculation of user benefits and project performance measures.

Alternatives Reviewed

While the Locally Preferred Alternative (LPA) established a starting point for the Evaluation of Scoping Options, other reasonable alternatives were identified for review to determine whether the best alignment and means of providing the east-west mobility choices is selected for further study. Alternative alignment options were identified for review during the Scoping process. Following refinement and development of additional alignment options, a second level of reviews was conducted with the Technical Advisory Group (TAG) and the general public. The evolution of the alignment options is described in this section.

Scoping Alignment Options

In addition to the LPA, additional alternatives were developed considering input received from the communities interested in avoidance of State Road 7, land use, travel markets and operational factors. A total of five alignment options were presented at the Scoping workshops and two additional alignments were identified by participants. A listing of these alignment options is shown in Exhibit 7 along with their popularity with participants at the Scoping workshops expressed as number of 'votes.'

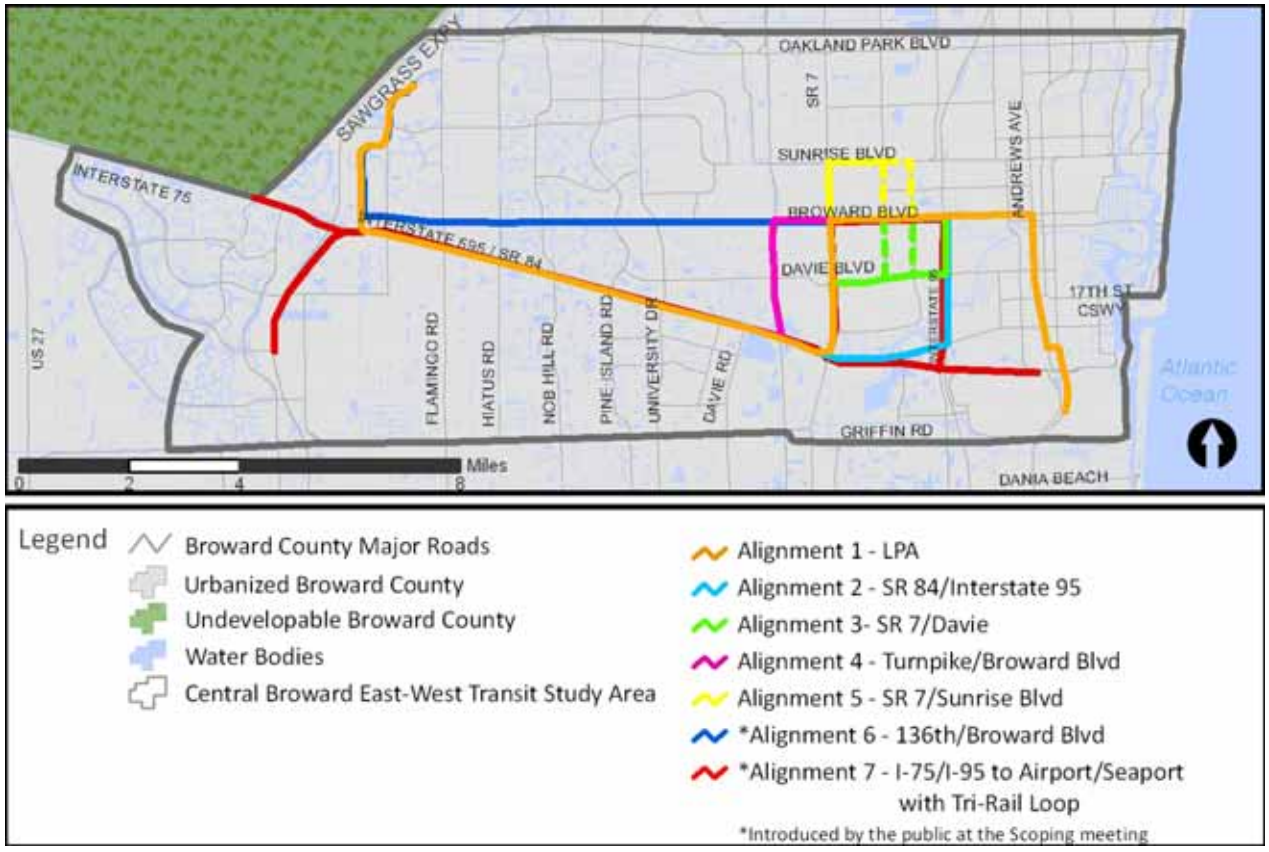
Exhibit 7: Initial Alignment Options Reviewed in Scoping

Alignment Option	Description	Number of Votes
1	I-595 to SR 7 to Broward Boulevard	14
2	I-595 to SR 84 to I-95 to Broward Boulevard	4
3	I-595 to SR 7 to Davie Boulevard to Broward Boulevard	2
4	I- 595 to Florida's Turnpike to Broward Boulevard	0 (zero)
5	I-595 to SR 7 to Sunrise Boulevard to Broward Boulevard	4
6	136 Avenue to Broward Boulevard	3
7	I-75 to I-595 to Fort Lauderdale-Hollywood International Airport	1

Of the five alignment options presented during Scoping, all but the fourth Turnpike Alignment were carried forward for further review and evaluation. Alignment 6, introduced by the public, was eliminated due to fact that Broward Boulevard does not connect to 136th Avenue and the need for extensive right-of-way takings with this alignment. Alignment 7 was further modified from a loop system to a split route alignment option that provided for southbound (to the airport) and northbound (to downtown) service at the junction of SR 84 and Andrews Avenue. The portion of Alignment 7 that extended into Weston was deferred to the planned I-75 corridor study which will examine a full range of options for this connection. Comments from Weston participants during the earlier Alternatives Analysis were not in favor of this extension.

The alternatives identified during the Scoping process are illustrated in Exhibit 8.

Exhibit 8: Initial Scoping Alignment Options



Following the Scoping meetings, an additional alignment option was developed that deviated south from I-595 at University Drive to serve a promising travel market at the South Florida Education Center. Early results of the travel demand modeling identified a greater potential ridership at this activity center. This alignment option was carried forward as Scoping Option 6.

Definition of Alternatives

A description of each optional alignment identified during Scoping that was carried forward for further review by the Technical Advisory Group (TAG) is detailed below for Scoping Options 1 through 6. Additional options identified by the TAG are described as TAG Options 7 through 9. All nine alignment options were evaluated for further consideration in the narrowing of the Build alternatives. Exhibits 9 through 17 illustrate the final nine alternatives evaluated in the fall of 2009.

Scoping Option 1 – Locally Preferred Alternative

This option (previously Scoping Alignment 1) begins at Bank Atlantic Center / Sawgrass Mills, runs through the Sawgrass International Corporate Park to I-595, then turns north on SR 7 to Broward Boulevard, east to downtown Fort Lauderdale and south on Andrews Avenue adjacent to the Florida East Coast Railroad corridor where it terminates east of the Fort Lauderdale-Hollywood International Airport via US 1.

Exhibit 9: Scoping Option 1

Scoping Option 2 – I-95

This option (previously Scoping Alignment 2) deviates from the LPA alignment where it turns north from I-595 to travel along I-95 instead of SR 7 / US 441 (SR 7), as in the LPA.

Exhibit 10: Scoping Option 2

Scoping Option 3 – SR 84

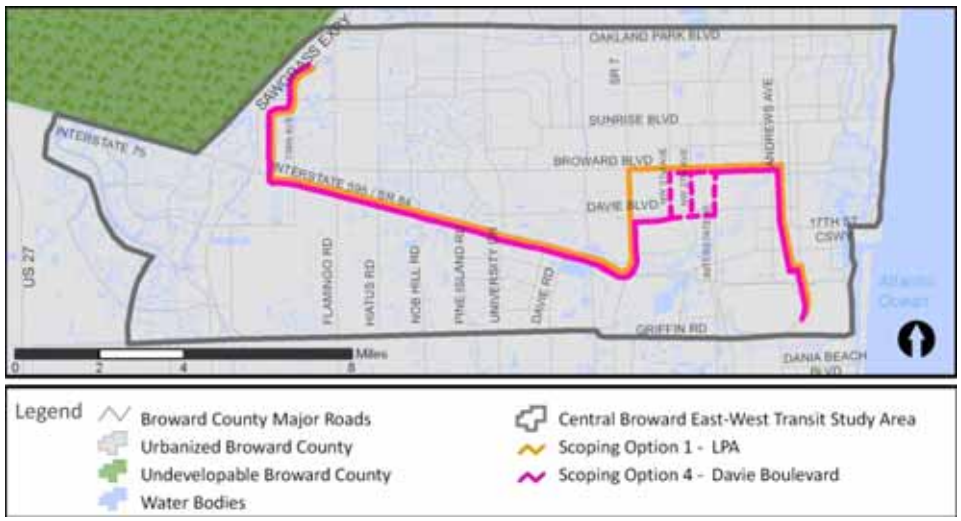
Scoping Option 3 (a modification of Scoping Alignment 7 introduced by the public) deviates from the LPA by proceeding past I-95 and merging with State Road 84 to Andrews Avenue where the route splits to the north and south on Andrews Avenue. The northbound alignment continues to Broward Boulevard terminating at the Tri-Rail station at I-95, and the southbound alignment continues to the airport. This split route would accommodate two service lines.

Exhibit 11: Scoping Option 3

Scoping Option 4 – Davie Boulevard

Scoping Option 4 (previously Scoping Alignment 3) deviates from the LPA by turning north from I-595 onto SR 7, then turning east onto Davie Boulevard with optional alignments to the north via NW 31st Avenue, NW 27th Avenue or the I-95 / Tri-Rail corridor to the Tri-Rail station on Broward Boulevard where it returns to the LPA alignment to downtown and the airport.

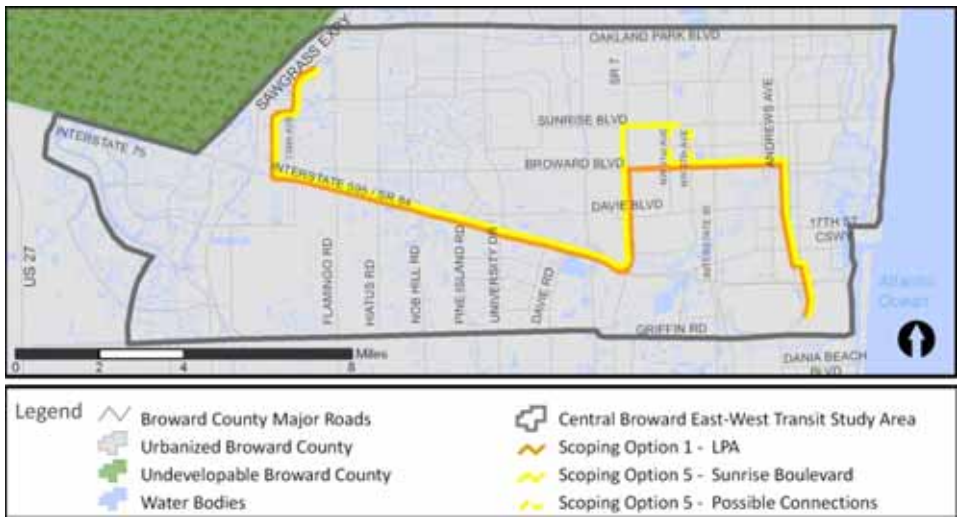
Exhibit 12: Scoping Option 4



Scoping Option 5 – Sunrise Boulevard

This option (previously Scoping Alignment 5) deviates from the LPA by continuing farther north on SR 7 to Sunrise Boulevard, where it continues south on optional routes along NW 31st Avenue and / or NW 27th Avenue, where it returns to the LPA alignment at Broward Boulevard.

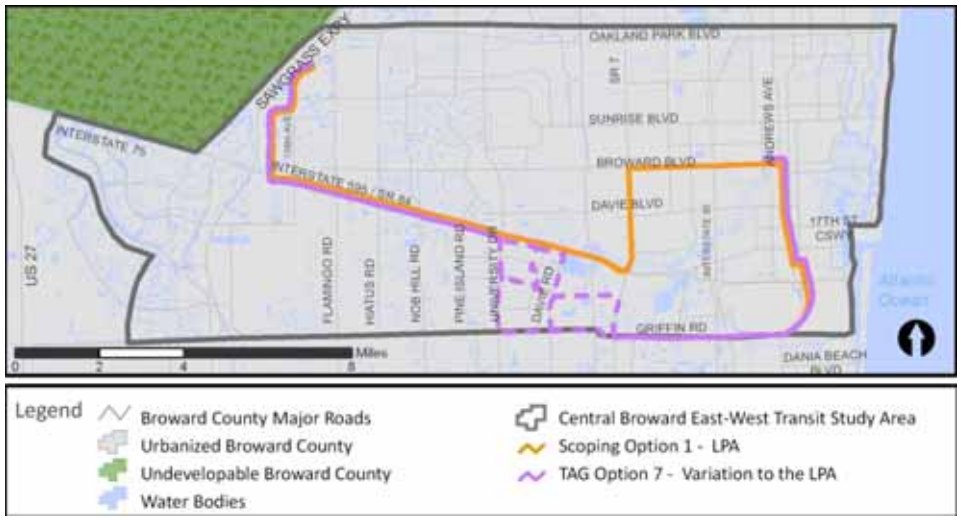
Exhibit 13: Scoping Option 5



Scoping Option 6 – Griffin Road

Scoping Option 6 deviates from the LPA by serving the South Florida Education Center directly south of I-595 at multiple optional routes along University Drive, College Avenue, Davie Road and SR 7 (but not bifurcating the campus areas), and continuing south to Griffin Road to the east, turning north on Andrews Avenue / US 1 to the Broward County Transit Central Terminal. Should this alignment option be carried forward, further refinement of this alignment would be required. The dotted lines for the alignment in the SFEC indicate optional alignments that would be reviewed with stakeholders during the next Study phase to avoid adverse impacts to the campus. This option was introduced after the scoping workshops, based on the potential travel markets identified by initial model runs and in consultation with the educational institutions in this activity center.

Exhibit 14: Scoping Option 6



Upon review of these six options with the Technical Advisory Group (TAG), additional options were recommended. A number of competing factors were introduced by the TAG and the trade-offs associated with each were debated. Two key factors framed the discourse from which these additional options emerged, namely, the importance of addressing a broader purpose and need to include more economic redevelopment, and providing direct service to the South Florida Education Center (SFEC). The purpose and need addressed by these additional options remains consistent with the overriding goal of serving east-west travel flows.

TAG Option 7 – Modified LPA with SFEC Connectivity

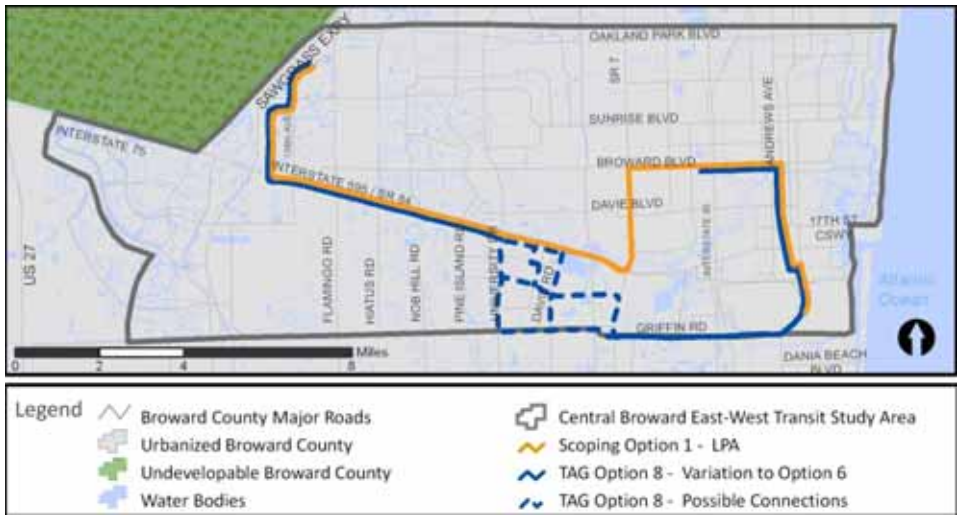
This option deviates from the LPA, turning south on University Drive to extend through the South Florida Education Center along Nova Drive, returning to the SR 7 alignment through the Davie Transit Oriented Corridor.

Exhibit 15: TAG Option 7

TAG Option 8 – Griffin Road Alignment

TAG Option 8 is a modification of Scoping Option 6, including a recommendation from the TAG to add the extension to connect to the Tri-Rail station on Broward Boulevard.

Exhibit 16: TAG Option 8



TAG Option 9 – Oakland Park Boulevard Alignment

A new alignment was added that goes north from Sawgrass International Corporate Park along 136th Avenue past the Sawgrass Mills Mall, north on Flamingo Road to Oakland Park Boulevard continuing east, then turning south on SR 7 to Broward Boulevard where it turns east toward Andrews Avenue, and heads south on Andrews Avenue, where it continues to the Airport similar to all other options.

Exhibit 17: TAG Option 9

Scoping Options 1 through 6, and TAG Options 7 through 9, were then evaluated using evaluation criteria weighted in consultation with the TAG.

Analysis and Evaluation

Criteria Development

Recommended evaluation criteria to be applied to these nine defined alternatives are derived from three evaluation frameworks: project goals and objectives, Federal Transit Administration (FTA) Section 5309 New Starts Criteria, and National Environmental Policy Act (NEPA) Criteria. Given that specific criteria identified in these evaluation frameworks are in many cases redundant, the recommended evaluation criteria and performance measures for this project are a combination of the criteria that correspond to all three frameworks without being duplicative. Exhibit 18 correlates the project goals and performance measures. For the full matrix correlating the goals, objectives, evaluation criteria, and performance measures, see Appendix B.

Exhibit 18: Goals and Performance Measures

Goals	Performance Measures
Travel and Mobility: **Enhance east-west mobility in central Broward County.**	Number of daily riders
	Number of people within ½ mile of potential stations
	Number of jobs within ½ mile of potential stations
	Number of major activity centers served
	Number of connections with existing Tri-Rail service
	Transit ridership potential
	Change in person capacity
	Volume to capacity ratio
	Average transit trip length
Financial and Economic: **Most efficiently use available financial resources, and support economic growth and development.**	Annualized capital cost and O&M cost per rider
	Annual operating cost per mile (not including background bus network)
	Economic development potential (serves Regional Activity Centers, Local Activity Centers, and Community Redevelopment Agencies)
Community: **Be consistent with the needs and desires of the residents of Broward County, in order to maximize community acceptance and support.**	Support exists
	Number of minority households within ½ mile of potential stations
	Number of low income households within ½ mile of potential stations
	Number of 65+ households within ½ mile of potential stations
	Number of disabled people within ½ mile of potential stations
Land Use: **Ensure compatibility between land use policies and transit service so that the need for trip-making and the amount of travel is reduced and the opportunities for transit-oriented development are maximized.**	Level of pedestrian/bicycle access
	Level of support for Transit Oriented Developments/Transit Oriented Corridor plans and/or policy initiatives
Environmental: **Enhance and preserve the social and physical environment, and keep potential impacts to sensitive resources to a minimum.**	Number of wetland areas contiguous to the alignment
	Number of parks contiguous to the alignment
	Number of community facilities within ¼ mile of the alignment
	Number of listed contaminated sites within ¼ mile of the alignment
	Number of threatened and endangered species sites within ¼ mile of the alignment
	Number of historical and archeological sites within ¼ mile of the alignment
	Level of emissions

Performance Measure Analysis

Performance measures were created to evaluate the criteria for each of the alignment alternatives. The performance measures were calculated by using quantitative or qualitative data. Most performance measures were quantitative and used raw figures from transportation and ridership forecasting models, U.S. Census data, cost estimates, and other measurable data. Qualitative performance measures include economic development potential, local support, existing development patterns, and future land use plans and policies and were rated based on existence or absence of these factors and experiences from other projects. Once assessed, all performance measures were given a point value (1, 2, or 3) based on how the performance measure met the needs of the goals and objectives. Results of the evaluation were further reviewed with the TAG to gain additional insights and recommendations.

Travel and Mobility

Evaluation of this goal assesses the degree to which alternatives could meet the mobility objectives. The evaluation performance measures for this goal include transit ridership potential, connectivity (to other transportation systems, residential areas, major activity centers and places of employment), total travel time savings in the corridor, and congestion reduction.

Performance measures for transit ridership potential were based on data generated by the latest version of the regional travel demand model, also known as the Southeast Florida Regional Planning Model (SERPM), version 6.5. The project team worked closely with the Federal Transit Administration staff to refine the model in an effort to improve the reliability of its forecasts of transit ridership. A number of quantitative measures reflect the potential of an alternative to meet the travel and transportation needs of residential areas.

The *number of daily riders* was used to measure the total number of daily passengers estimated to be using the system in 2035. A higher number of daily riders translated into a higher score. For this performance criterion, a higher score is good.

The *number of people who live within a half mile* of potential boarding / access points for the alternatives was calculated to determine this.[1] The more people within half mile of potential station locations translate into a higher score. For this performance criterion, a higher number is good.

Using the same methodology and proximity, the *number of jobs within half mile* of potential stations was also calculated to assess whether the alignments meet the travel and transportation needs for workers. Alternatives were ranked relative to each other, based on the absolute number of jobs within a half mile of boarding points for the alternatives.[1] Again, the greater number of jobs within a half mile of potential station locations translates into a higher score.

The *number of activity centers* measures the potential for connectivity of each alternative to the major trip generators in the study area.

The ability of an alternative to *connect to the existing regional transit system*, Tri-Rail, is another connectivity indicator and is measured by the number of Tri-Rail stations that are directly served.

[1] Data was obtained from the U.S. Census Bureau for existing conditions and from the Broward MPO for projected 2030 conditions.

Providing more connections to existing fixed guideway transit projects produces a synergistic effect on transit ridership. For this criterion, more connections, and therefore a higher number, are good.

Transit ridership potential is directly related to the ability to capture *new transit riders*. The number of new transit riders was derived by calculating the difference between existing ridership and projected ridership; the larger the difference, the higher the score. For this performance criterion, a higher number is good.

The problem statement for the project highlights the expected increase in traffic congestion resulting from anticipated growth in the county. Two elements that were used to assess congestion reduction were change in person capacity and a volume to capacity ratio on east-west arterials within the study area.

Change in person capacity measures the difference between the performance of the alternative and a baseline. Person capacity is the number of automobiles multiplied by the average auto occupancy (number of people in the car). A negative number appears for certain alternatives because fewer cars will travel through the area where an alternative results in fewer general purpose travel lanes indicating a decrease in mobility.[2] The baseline used for purposes of the Evaluation of Scoping Options comparison includes existing and committed projects plus express buses. Person capacity is compared for traffic flow at a specific location within the study area. For this performance criterion, a higher (positive) number is good.

Volume to capacity ratio is a measure of a roadway's level of service (LOS). If the ratio of volume to capacity is greater than one, there is a degradation of the level of service reflecting decreasing mobility. For this performance criterion, a lower number is good.

Average transit trip length measures the total miles traveled for the average rider for each alternative. Longer trips, or commuter trips, directly meet the purpose and need of the project, therefore lengthier transit trips translate into a higher score. Average transit trip length was defined as passenger miles divided by ridership (or number of boardings). For this performance criterion a higher number is good.

Financial and Economic

Financial and economic effectiveness was evaluated to assess the likelihood that an alternative can be implemented and will be cost effective in terms of capital and operating expenditures.

The cost effectiveness of each alternative was measured in the Evaluation of Scoping Options by comparing the estimated *annualized capital costs plus cost to operate and maintain (O&M)* each alternative divided by projected annual ridership. This is also a key criterion for the New Starts submittal. During the EIS, cost effectiveness of the proposed project will be evaluated according to a measure of transportation system user benefits, based on a multimodal measure of perceived travel times faced by all users of the transportation system for the horizon year of 2035 divided by the incremental cost of the proposed project. Incremental costs and benefits will be calculated as the differences between the proposed Build Alternative(s) and Baseline Alternative. In this case, a lower cost is good.

[2] Assuming that lanes will be utilized to accommodate the alignment and no right-of-way will be acquired.

Operating cost per passenger mile measures how efficiently each alternative would perform on an annual basis. Estimated annual operating cost of each alternative was divided by the total number of passenger miles for the system. Cost efficiency is also directly proportional to attractiveness of an alternative; therefore, a lower number is good.

Economic development potential is a qualitative criterion which assesses degree to which potential economic development exists by virtue of transit supportive characteristics of the area surrounding the alignment. An alternative where potential exists because of land use patterns was rated "Moderate" and received one (1) point; alternatives having existing land use densities and transit supportive land use policies or zoning was rated "Good" and received two (2) points; and alternatives in areas that include designated Transit Oriented Developments, Transit Oriented Corridors, Local Activity Centers, Regional Activity Centers, or is otherwise designated for redevelopment, such as Community Redevelopment Areas were rated as "Excellent" and received three (3) points. For this performance criterion a higher rating was good. For the Draft EIS, this evaluation will be based on more in-depth analysis of market and land use conditions.

Community

Community and land use issues associated with an alternative were evaluated to assess the potential for impacts to neighborhoods and protected or underserved populations, consistency with local plans, and agency and community support.

Local government and community support is a qualitative criterion based on support or opposition for an alternative expressed by local agencies or jurisdictions in the form of resolutions endorsing or opposing an alternative. This performance measure also reflects a general assessment of support or opposition for an alternative or alignment based on comments and input received from coordinated agency meetings and review with local governments, FDOT, and resource agencies. There were three categories for scoring: "Unknown" (U), where there was either limited public response or uncertainty about the project and received one (1) point; "Mixed Opinions" (M), which included either public or municipal support and received two (2) points; and "Supportive" (S), which included *both* public and municipal support and received three (3) points. For this performance criterion, a higher rating was good.

Environmental justice is an integral element in transportation planning to ensure a policy of fairness toward disadvantaged populations, many of whom are also transit dependent. Four segments of the population have been identified as being potentially disadvantaged or transit dependent. These segments include *minority* (non-white), *low-income* (living below the poverty line), *elderly* (age 65 and over), and *disabled* populations. Each of these segments was assessed using the absolute number of these populations (or households) within a half-mile of boarding points associated with the proposed system.[3] Because the intention of this exercise is to try to serve transportation disadvantaged groups, for all these performance criteria, a higher number is good.

[3] Data was obtained from U.S. Census Bureau for existing conditions and Broward MPO for projected 2030 conditions.

Land Use

It was determined that land use which maximizes transit oriented development opportunities would be compatible with the goals of this Study. Both existing development patterns and future land use plans and policies were evaluated to determine land use effectiveness.

Existing development patterns are influenced by many factors. One measure of development patterns that support transit is the existence of adequate facilities for *pedestrian and bicycle access*. There were three categories for scoring pedestrian and bicycle access: "Poor", where there are no sidewalks or bicycle facilities and received one (1) point; "Average", where either sidewalks or bicycle facilities exist and received two (2) points; and "Good", where both sidewalks and bicycle facilities exist and received three (3) points. For this performance criterion a higher rating is good. For the Draft EIS, this evaluation will be based on a more detailed assessment of existing development conditions.

Future land use is a qualitative measure of the *level of support for transit oriented development and corridor plans, and policy initiatives* which support future transit supportive land use. There were three ratings for future land use plans and policies: "Moderate", where potential exists because of land configuration or zoning, which received one (1) point; "Good", where existing policies or plans support transit oriented developments, or existing land uses are supportive but land is not readily available, which received two (2) points, and; "Excellent", where existing policies and plans support transit oriented developments or existing uses are supportive and land is available, which received three (3) points. For this performance criterion a higher rating is good. For the Draft EIS, this evaluation will be based on the FTA criteria for transit-supportive land uses.

Environmental

Environmental goals are to enhance and preserve the physical and social environment and minimize potential impacts to sensitive resources. The potential for environmental issues was gauged by a simple inventory of the number of sensitive land uses or resources within proximity to the alternative. The extent to which the sensitive resources are proximate to the alignment does not mean these resources will be negatively affected by the project. More information about the conceptual design, refined alignment and technology will be required to conduct an assessment of potential impacts to these sensitive resources. This will be conducted during the EIS study phase of for the Build, TSM (Baseline) and No Build Alternatives to gain a thorough understanding of the potential for negative and beneficial effects of the project.

The types of sensitive environmental resources inventoried included wetlands, parks, community facilities, listed and contaminated sites, threatened and endangered species, and listed historical and archaeological sites. Wetlands and parks were counted if they were contiguous with or adjacent to the potential alignments. Community facilities, listed and contaminated sites[4], threatened and endangered species, and listed historical and archaeological sites were counted if they were within a quarter-mile of the potential alignments.

Proximity to the alignment could result in potential impacts to certain sensitive receptors such as wetlands, parks, threatened and endangered species and listed historical and archeological sites;

[4] Hazardous material and Brownfield site data (contaminated sites) from existing federal, state and local databases was the source for this inventory.

however, the extent to which potential effects would occur was not measured at this screening level. The higher the number of sensitive resources, the higher the potential for impacts to be assessed, therefore the lower the score. In the case of community facilities, proximity to a premium transit service is a benefit, consequently, a higher number of community facilities served by the alternative resulted in a higher score.

Emissions reduction potential assessment is based on a quantitative analysis of hydrocarbons, carbon monoxide, and oxides of nitrogen emissions based on the MOBILE air emissions model and SERPM travel demand model forecasts. Southeast Florida is currently an attainment area for all pollutant criteria established by EPA; however, any new transportation project must not introduce any new exceedances in order to maintain conformity with these national standards. The measure used for Evaluation of Scoping Options focused on the potential for reduction of greenhouse gases (GHG) which is a recent focus of national and state policy.[5] Therefore, more reduction in GHG translates into a higher score. For this performance criterion a higher number is good.

Other important elements of the environmental assessment will be the study and analysis of the potential for noise and vibration impacts to sensitive land uses in the community such as residents, schools, hospitals and medical institutions, libraries, museums, theatres; property acquisitions and displacements; and travel time savings. Due to the extent of analysis required and the lack of necessary details for the alternative alignments, these measures were not evaluated during Evaluation of Scoping Options. These assessments will be conducted during the next EIS phase for all alternatives.

Tallying the Data

With the exception of qualitative data (as previously detailed), the scoring system was a three-tiered system and based on normalized data. The data was normalized by taking the raw data and dividing the data into four equal parts (quartiles). Those numbers were then given a point based on where they fell in the quartiles: numbers that fell into the first quartile were given one (1) point, numbers that fell between the first quartile and the third quartile were given two (2) points, and numbers that fell within the fourth quartile were given three (3) points. Qualitative data (not based on raw data numbers), was not normalized and relative scores were assigned, as previously detailed.

Compilation of performance measure results, including data valuations, calculation results, and rankings can be found in Appendix C.

Weighting of Performance Measures

During the second TAG meeting, members were asked to weight the measures based on “highest priority” and “not highest priority”. All performance measures for the goals of improving travel and mobility and maximizing transit oriented development opportunities were weighted with “highest priority”. All other goals received mixed weighting assignments. A rating of “Highest Priority” was weighted twice as much (and given a weight of two) as those of “Not Highest Priority” (which were given a weight of one). Those weightings are illustrated as follows in Exhibit 19.

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[5] The data source for GHG emission rates (pounds CO2 per passenger mile) by mode (auto and light rail transit) is *O'Toole, Randal. (April 14, 2008). Does Rail Transit Save Energy or Reduce Greenhouse Gas Emissions, Policy Analysis, Number 615. CATO Institute.*

Exhibit 19: Performance Measure Weights Assigned by the TAG

Goals	Performance Measure	Weight
Travel and Mobility	Number of daily riders.	2
	Number of people within one-half mile of potential stations.	2
	Number of jobs within one-half mile of potential stations.	2
	Number of major activity centers served.	2
	Number of connections with existing transit services or modes.	2
	Number of new transit riders.	2
	Change in person capacity (auto) on east-west arterials.	2
	Volume/capacity ratio on east-west arterials.	2
	Average transit trip length.	2
Financial and Economic	Annualized capital cost and O&M cost per rider.	1
	Annual operating cost per passenger mile.	2
	Potential exists or not (serves RAC, LAC, CRA).	2
Community	Support exists.	2
	Number of low income households within ½ mile of potential stations.	2
	Number of minority households within ½ mile of potential stations.	1
	Number of 65+ years old people within ½ mile of potential stations.	1
	Number of disabled people within one-half mile of potential stations.	1
Land Use	Level of pedestrian/bicycle access.	2
	Level of support for TOD/TOC plans and/or policy initiatives.	2
Environmental	Number of wetland areas contiguous to the alignment.	1
	Number of parks contiguous to the alignment.	2
	Number of community facilities within ¼ mile of the alignment.	2
	Number of listed contaminated sites within ¼ mile of the alignment.	1
	Number of threatened and endangered species sites within ¼ mile of the alignment.	1
	Number of historical and archeological sites within ¼ mile of the alignment.	1
	Reduction in greenhouse gasses (pounds of CO_2 per year).	2

Acronyms: O&M stands for Operating & Maintenance and CO_2 stands for Carbon Dioxide. The following are Future Land Use categories in the Broward County Land Use Plan: RAC stands for Regional Activity Center; LAC stands for Local Activity Center; CRA stands for Community Redevelopment Agency; TOD stands for Transit Oriented Development; and TOC stands for Transit Oriented Corridor.

After compiling the results for the performance measures relative to the project goals of travel and mobility, financial and economic, community, land use, and environmental for all nine alternatives, final scores were normalized, weighted and tabulated. See Appendix D for details by alternative. Exhibit 20 details composite scores and ranking for each of the optional alignments based on the technical evaluation of the performance measures. This information was presented at the third TAG meeting.

Exhibit 20: Alignment Option Technical Composite Scores and Ranking

Alignment Option	Composite Score	Ranking
Scoping Option 5 – Sunrise Blvd	107	1
TAG Option 8 – Extension to Griffin Rd Option	106	2
TAG Option 9 – Oakland Park Blvd	103	3
Option 7 – Variation to LPA	102	4
Scoping Option 1 – LPA	98	5
Scoping Option 6 – Griffin Rd	89	6
Scoping Option 4 – Davie Blvd	82	7
Scoping Option 3 – SR 84	67	8
Scoping Option 2 – I-95	60	9

The technical results of the evaluation of the nine alignment options were provided to the TAG for review, comment and a voting exercise to determine their preferences for alignments at the third scheduled meeting. After review and discussion of the analysis and scoring, the TAG was asked to vote on their top two alignment option preferences. TAG members were asked to indicate their first and second preferences. First preferences were weighted twice as much as second preferences. Those alignments not ranked did not receive any votes. Results of the TAG votes follow in Exhibit 22.

Exhibit 21: TAG Members discussing alignments before voting

Exhibit 22: TAG Vote Composite Scores and Ranking

Option	Number of Choice #1 Votes	Number of Choice #2 Votes	Weighted Composite Score	TAG Ranking
Option 7 – Variation to LPA	6	2	14	1
TAG Option 9 – Oakland Park Blvd	4	1	9	2
Scoping Option 5 – Sunrise Blvd	2	4	8	3
TAG Option 8 – Extension to Griffin Rd Option	2	3	7	4
Scoping Option 6 – Griffin Rd	0	1	1	5
Scoping Option 1 – LPA	0	0	0	NA
Scoping Option 2 – I-95	0	0	0	NA
Scoping Option 3 – SR 84	0	0	0	NA
Scoping Option 4 – Davie Blvd	0	0	0	NA

It should be noted that some TAG participants participated online, a few participants abstained from voting, and not all participants voted for a second choice. Scoping Options 1 through 4 received zero (0) votes.

Interestingly, the TAG participants' preferences for their top four options were consistent with the results of the technical analysis (shown in Exhibit 20); however, their preferred order was different. Participants were not asked to explain the reasoning behind their preferences.

Following the alignment voting, the TAG was also asked to consider transit technology choices for the top two alignments they had chosen (Option 7 and Option 9).

Technology Review

A review and evaluation of the different transit technologies was considered integral to the final selection of the alternatives. At this point in the Study, light rail transit (LRT) and bus rapid transit (BRT) are the two technologies in consideration.

The objective of the Evaluation of Scoping Options process is to select one Build Alternative to carry forward into the Environmental Impact Statement (EIS) process, and because the Build Alternative is both an alignment route (referred to as Scoping Options and Technical Advisory Group (TAG) Options in the previous section) and a transit mode or technology, choosing the technology is an integral part of the decision-making process. Although the alignment for premium transit is selected by utilizing existing transportation models and other tools, the choice of technology is often based on more

subjective criteria, including the ability to blend the system into the diverse environment of the service area. The technology that is chosen would not only need to serve downtown Fort Lauderdale, but also serve outlying activity centers, such as the South Florida Education Center (SFEC), Midtown Plantation, and the Sawgrass Mills Mall/Bank Atlantic Center area. Because there is no single finite way to resolve the debate, the technology evaluation has been taken through a series of iterative technical evaluations. In addition to technical evaluation, a number of non-technical issues arise when determining which technology to utilize, including political support, public sentiment, agency cooperation, and inter-governmental coordination.

Technology Review Background

Between 2002 and 2005 the Alternatives Analysis (AA) phase of this Study was performed. One of the objectives of the AA assessment was to determine the most appropriate technology (or mode) that could meet travel needs within central Broward County. Modes considered during the Alternatives Analysis included:

- Express Bus;
- Bus on High-Occupancy Vehicle (HOV) Lanes;
- Bus Rapid Transit (BRT);
- Light Rail Transit (LRT);
- Commuter Rail;
- Heavy Rail;
- Automated Guideway Transit (AGT); and
- Monorail.

Technology options were evaluated based on a pre-determined set of guidelines. Evaluation was conducted by considering advantages and disadvantages of each technology as they related to the defined guidelines. Only technologies that satisfied defined guidelines were considered feasible to carry forward in the Central Broward East-West Transit Analysis. The guidelines for the AA were:

1. Compatibility with the existing and planned transportation system and with community desires and the travel needs of central Broward County.
2. Cost-effectiveness. Projected capital and operating and maintenance costs should be comparable to that for at-grade alignments within comparable physical environments and the overall Broward County Transit system.
3. Adaptability to a variety of operating environments, including grade separation, ease or feasibility of system extension, transfer convenience, and feasibility of implementation in various rights-of-way.
4. Adaptability in service frequency to provide sufficient operating capacity for expected ridership.
5. Mitigating environmental impacts. A qualitative assessment of potential traffic, visual, historic, and other environmental impacts were noted.

6. Compatibility with existing and planned land uses, considering existing and planned development densities, mixed uses, socio-economic factors, neighborhood compatibility, and other factors that could affect level of transit demand.
7. Reliability based on proven technology.

As a result of this evaluation, the technology alternatives carried forward in the AA were BRT and LRT. (For further details of the evaluation during this phase, refer to the Alternatives Analysis Summary Report 2005.)

Although the Broward Metropolitan Planning Organization (MPO) selected LRT as part of the Locally Preferred Alternative (LPA) at the end of the AA, during the Scoping meetings in 2008, these two technologies were presented to the public. The decision to reintroduce BRT was based on public concern about the potential impacts of LRT and the need to consider all reasonable alternatives. More emphasis during Scoping was focused on the alignments; however, comments were received on the technology, particularly those with preferences for one over another. (For details on the technology review during Scoping, refer to the Scoping Summary Report March 2009.)

Comparing BRT and LRT

BRT is an integrated system which uses buses or specialized vehicles on roadways or dedicated travel lanes to quickly and efficiently transport passengers to their destination. It provides rail-like service utilizing rubber-tire vehicles. LRT, on the other hand, is an electrically-powered train system that can operate either in mixed traffic (with automobiles, trucks, etc.) or on a separate right-of-way. Power is typically provided through overhead wires (catenaries).

BRT and LRT each have their advantages. BRT generally has the advantage of having more flexibility than LRT, being able to phase in service rather than having to wait for an entire system to be built, and being used as an intermediate step to a light rail system. LRTs advantages include increased economic development and improved community image.

Beyond the technical specifics, public perception typically influences the consideration of each technology. Public perception of light rail is that it is more “permanent,” with quiet, comfortable vehicles, and a general impression of high quality. In contrast, public perception of BRT (possibly due to lack of familiarity with this technology) is that it shares those same, often negative characteristics as regular bus service.

Both technologies have the ability to integrate traffic signal priority, pre-board ticketing, real-time information, increased capacity, and low floors for easier boarding. Both technologies are being successfully utilized in major markets in the United States.

Technology Review Methodology

During the Evaluation of Scoping Options phase, a fresh approach was taken to assess which technology would be best suited for the project. While previous guidelines were expanded upon, more non-traditional, less rigid characteristics of the vehicles, corridor impacts, and overall system characteristics were considered, as detailed in Exhibit 23.

Exhibit 23: Transit Technology Characteristics

Area of Focus	Goal	Key Characteristics
Vehicle	Comfort	Vibration
		Room/spaciousness
		Turning comfort
		Door access, size, and location
		Seats
	Safety	Braking time
		Off-route service
	ADA Accessibility	Floor height
		Lift system availability
		Ramp availability
	System Capacity	Passenger count
		Speed
Corridor Impacts	Economic Development	Review of Case Studies
	Traffic Impacts	Signal prioritization
		Restrictions to traffic
System	Lifecycle Costs	Vehicle cost per passenger per year
	Time Frame	Roadway impacts
		Implementation of system
		EIS process
	Operational Flexibility	Off-route flexibility
	Energy Source	Hybrids availability

Similar to the performance measures of alignments, the TAG was asked to weight the criteria considered for the transit technology. The results of the weighting exercise indicate that comfort, safety, ADA accessibility, capacity, lifecycle costs, and flexibility in energy sources were a higher priority for the TAG members. As a result, these criteria were given a weighting of two while the remaining criteria were not weighted, as shown in Exhibit 24.

Most scores were calculated by adding how many of the key characteristics were met for both technologies. A majority of those characteristics were similar enough to generate equal scores. Those goals that had a range of scores included comfort, system capacity, economic development, lifecycle costs, time frame, and operational flexibility. LRT received a higher score for comfort because those vehicles tend to have less vibration, be more spacious, and have a larger turning radius. LRT received a slightly higher score for system capacity due to the incremental advantages in both passenger capacities per vehicle and maximum operational speeds. The advantage is slight because limitations of capacity in both vehicle types can be overcome by adjusting the frequency of service. LRT received a higher score for economic development, because as previously noted, case studies show that higher economic development is found in areas with LRT over areas with BRT. BRT received a higher score for lifecycle costs based on vehicle costs per passenger per year. The average costs of a BRT vehicle is

less than half of that of an LRT vehicle, while vehicle-life for both is relatively similar. Overall, lifecycle costs for BRT is approximately 54% of LRT. BRT received a slightly higher score for time frame because, while both systems would require going through the same EIS process, BRT would have a reduced implementation period and constructing the actual system would also take less time. BRT received a higher score for operational flexibility because of its ability to run both in a separated guideway, as well as in mixed traffic.

Results of the TAG weighting and the relative scores are shown in Exhibit 24, and further detailed in Appendix E.

Exhibit 24: Overall Vehicle Technical Preference

Goals	Weighting (as determined in TAG Meeting #2)	LRT Weighted Score	BRT Weighted Score
Comfort	2	6	2
Safety	2	4	4
ADA Accessibility	2	6	6
Capacity	2	6	4
Economic Development	1	3	1
Traffic Impacts	1	1	1
Lifecycle Costs	2	2	4
Time frame	1	2	3
Operational Flexibility	1	1	3
Energy Sources	2	6	6
Total Raw Score		37/48	34/48
Total Percentage		77%	71%

Based on technology alone, no clear technical preference emerges, with LRT rating higher by only a slight margin. Since the premise of BRT is to mirror the benefits achieved with LRT technology, it is no surprise that their relative benefits are well matched. Also, when further comparing these characteristics for both LRT and BRT, it was found that many characteristics were either comparable or could be overcome by modifications to either vehicle, in a way that equalized the comparative analysis.

After further review, it was agreed that evaluating a technology would be more effective within the context of each alignment. With the expectation that the context and character of surrounding land use of an alignment and type of structure (elevated or at-grade) could affect preferences for a technology, a supplemental assessment was conducted to gain additional insight into technologies for discussion.

Ultimately, the following three contextually-based characteristics stood out as substantiating tests for each technology on each alignment:

- Number of turns;
- Elevation; and
- Ridership.

A discussion of each measure and their relative importance follows.

Performance Measure Analysis

Performance measures for the contextual technical analysis were created to evaluate the criteria for the two transit technologies and were calculated using entirely quantitative data. The raw data was then normalized based on certain thresholds of the data.

The *number of turns* is a measure of two potential issues: the possibility of right-of-way issues and the need to reduce vehicle speed, both due to the turning radius of the vehicle. Great effort will be made to mitigate the need of appropriating right-of-way during Preliminary Engineering. Reducing the speed of the vehicle multiple times over the course of the alignment may have an effect on the vehicle's overall efficiency and ridership. The larger the number of turns, the more suitable the alignment is for BRT and less suitable for LRT.

Elevation, in this analysis, is directly related to the cost effectiveness of building elevated structures for the system. The costs associated with building elevated structures are better justified with a more permanent system. The number of miles for each alignment that were required to be elevated was calculated. For the options being evaluated, the only elevated portion was the segment within the I-595 corridor where an envelope for an elevated guideway was preserved through coordination with the roadway design of the I-595 managed lanes. Some variation in the length of this elevated segment occurs as some of the options remain in the I-595 corridor for a longer distance than others. Those alignments with more miles of elevated structure were considered more suitable for LRT and those with fewer or zero miles of elevated structure were considered more suitable for BRT.

Based on several case studies from the *Status of North American Light Rail Projects*[6] (October 2002), LRT cost efficiency improves dramatically as ridership increases; therefore *ridership*, in this case, is directly related to operating efficiency, and higher ridership experience is indicated with LRT systems. Specifically, an alignment with ridership greater than 20,000 showed a propensity towards LRT. An alignment with ridership less than 17,000 showed a propensity towards BRT.

[6] http://www.lightrail.com/projects.htm

Unlike the analysis of the alignments, where characteristics were either deemed as an advantage or disadvantage for each alignment, the transit technology characteristics were shown to either have a propensity to one technology or another. Raw scores were normalized on a base of 1, 2, and 3. The average of all normalized scores were taken and put on a scale from 0 to 1. Zero (0) showed an inclination to BRT and 1 showed an inclination to LRT.

Results of the contextual technical analysis are as follows, in Exhibit 25, and further detailed in Appendices F and G.

Exhibit 25: Contextual Technical Analysis

Results by Alignment	Score	LRT Suitability	BRT Suitability
Scoping Option 1 – LPA	.500		
Scoping Option 2 – I-95	.500		
Scoping Option 3 – SR 84	.667	✓	
Scoping Option 4 – Davie Blvd	.167		✓
Scoping Option 5 – Sunrise Blvd	.333		✓
Scoping Option 6 – Griffin Rd	.333		✓
Option 7 – Variation to LPA	.667	✓	
TAG Option 8 – Extension to Griffin Rd Option	.500		
TAG Option 9 – Oakland Park Blvd	.667	✓	

Technology Determination

The weighted review and contextual assessment was presented to the TAG for discussion and consideration prior to voting on transit technology preferences. The TAG was advised to consider any specific contextual alignment issues in weighting a preference for technology based on characteristics.

It was reiterated to TAG members that the purpose of the voting activities was to narrow the choices of alignments and technology to two (2) Build Alternatives, moving forward with either both technologies to be studied on one option or one technology for the top two options. A clear preference for LRT is evident as shown in Exhibit 26.

Exhibit 26: Transit Technology TAG Voting Results

Alignment Choice #1 TAG Option 7 Modified LPA		Alignment Choice #2 TAG Option 9 Oakland Park Boulevard	
LRT	**BRT**	**LRT**	**BRT**
10	6	8	2
Both: 4		Both: 1	

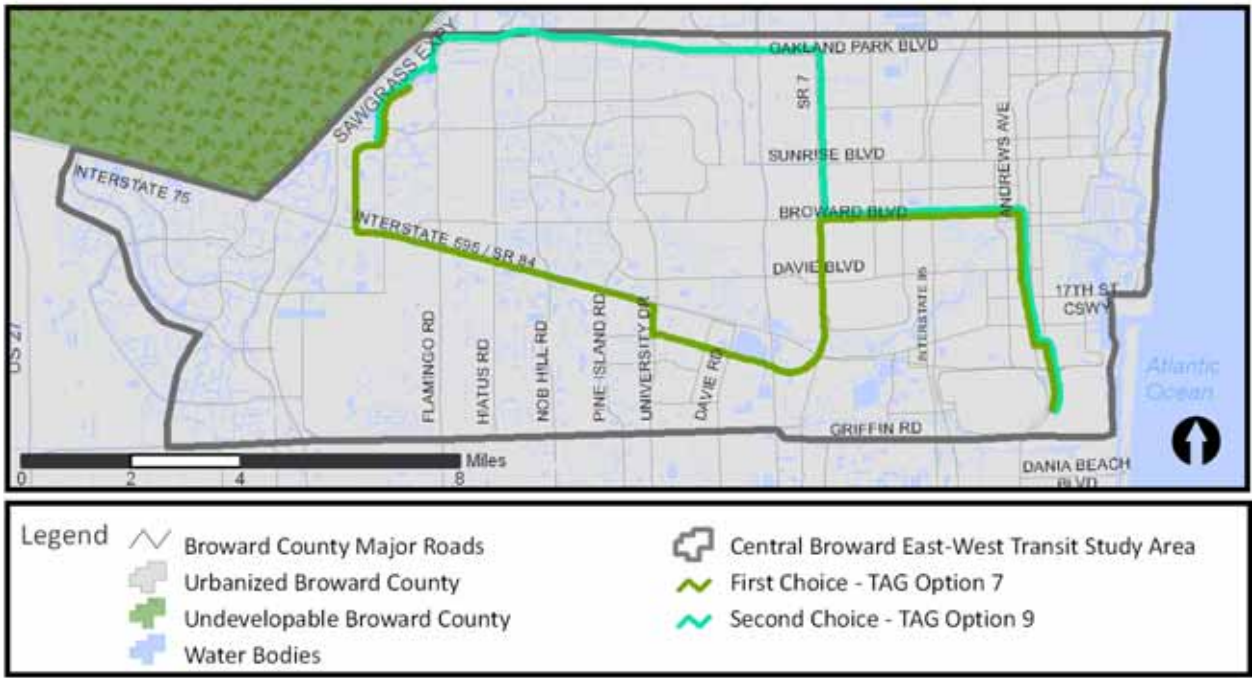
It should be noted that some TAG participants participated online, a few participants abstained from voting, and not all participants voted for a second choice or did not indicate a choice for both technologies for one alignment, therefore the results are not additive.

Narrowing of Alternatives for Further Study

The results of the voting exercise gained the following preference of the TAG for two Alternatives (also illustrated in Exhibit 27):

- First Choice – TAG Option 7 Modified LPA to serve SFEC with LRT
- Second Choice – TAG Option 9 Oakland Park Boulevard with LRT

Exhibit 27: TAG First and Second Choice Alternatives



TAG members were asked whether they would be open to advancing the study of LRT and BRT on the first choice alignment rather than one technology on two separate options. By a show of hands, the majority of TAG members preferred to move forward with two options to be evaluated with LRT only.

After voting was complete, TAG members were advised that the top four alignments would be taken to the public for further review and input. While the public were informed of the TAG's recommendations for the top two alignments, they were given the opportunity to provide input for all four alignments, as well as the two technologies. The combined input from the TAG and public was presented to the project sponsor and will be presented to local leadership for their consideration in determining which Build alternatives to carry forward into the detailed Environmental Impact Statement phase of project development.

It should be noted that during the TAG meeting, Broward County Transit (BCT) objected to the study of LRT only and indicated a strong preference for the study of BRT. It was also noted to the TAG that at the conclusion of Evaluation of Scoping Options (following additional outreach to gather public preferences) the alternatives would be reviewed with the Federal Transit Administration and that they may require that the EIS consider BRT in the review of all reasonable alternatives.

Results of Input from the Public

Three public workshops have been conducted and presentations were given at 21 homeowner association and community meetings throughout the study area. Participants at the workshops and presentations were asked to select their preferred route and vehicle options. Furthermore, participants were given the opportunity to veto one of the alignments. This survey was also made available on the project website from October 7, 2009 through December 30, 2009.

Almost sixty percent of the public favors TAG Option 7 (a modification to the LPA which serves the SFEC), which is also the top alignment choice of the TAG. The public's second choice alignment (19% in favor) is Scoping Option 5 (Sunrise Boulevard), the top scored option based on the technical analysis. Of those participants who chose to veto an alignment, 53% vetoed TAG Option 9 (Oakland Park Boulevard) and no one vetoed TAG Option 7.

Preferences for technology show a two to one preference (66.9%) for LRT over BRT. This is again consistent with the TAG preference for LRT.

A composite of all public input can be found in Exhibits 28 and 29.

Exhibit 28: Public Input Voting Results for Alignment Options

Option	Total votes		Percent of #1 Choice Votes
	Votes for #1 Choice	Veto Vote	
TAG Option 7 – Variation to LPA	103	0	59.2%
TAG Option 9 – Oakland Park Blvd	23	32	13.2%
Scoping Option 5 – Sunrise Blvd	33	13	19.0%
TAG Option 8 – Extension to Griffin Rd Option	15	16	8.6%

Exhibit 29: Public Input Voting Results for Transit Technology

Transit Technology	Vote	Percent of Votes
Bus Rapid Transit	58	33.1%
Light Rail Transit	117	66.9%

Final Refinement and Selection of a Build Alternative

Final refinement and selection of alternatives is based on a combination of technical analysis, TAG recommendations, public input, and agency feedback. The Florida Department of Transportation has consulted with BCT and the South Florida Regional Transit Authority (SFRTA) to determine what support potential operators may have for the alternatives. Considerable concern has been expressed by BCT as to technology (preference for BRT) and an alignment on I-595 (not in favor of any fixed guideway improvements within the I-595 corridor). BCT is preparing for roll-out of an express/limited stop bus service on I-595 consistent with the Build Alternative alignment preferred by the TAG and the public.

The Broward MPO adopted the 2035 LRTP in December 2009, which also calls for the need to address east-west travel. This new LRTP, known as "Transformations", places a high priority for funding of high capacity premium transit projects and for the construction of Mobility Hubs throughout the county. The policy shift to transit and transit-supportive development provides a consistent framework with the purpose and need of the Central Broward East-West Transit Project. A number of premium transit corridors are identified in the 2035 LRTP, including those that fall within the most popular alternative alignment choice among members of the public and the Technical Advisory Group. The Central Broward East-West Transit Analysis is included in the 2035 Cost Feasible Plan as an "Illustrative" project and would be included in an amended LRTP should reasonable funding resources be identified.

The result of FDOT's coordination with these potential operators and the Broward MPO is the identification of two separate corridor studies on Broward Boulevard and Oakland Park Boulevard. The studies will examine the feasibility of implementing improvements within a two to three year timeline. The range of improvements varies from signalization and intelligent transportation systems (ITS) to rapid bus service implementation to the possible peak-hour conversion of lanes for bus-only use.

The definition of build alternatives for the Central Broward East-West Transit Analysis resulted in a corridor that incorporates the previously identifies LPA with a deviation into the South Florida Education Center to capture this travel market. The Oakland Park corridor is the subject of a separate demonstration project and future alternatives analysis. The final definition of build alternatives was presented to the TAG on February 24, 2010.

The results of this Evaluation of Scoping Options indicate a clear preference for the modified LPA, which serves the South Florida Education Center and potentially the following Mobility Hubs (as shown in Exhibit 30):

- Gateway Hub located at NW 136th Avenue and Sunrise Boulevard;
- Anchor Hub located in the Sawgrass International Corporate Park;
- Community Hub located at I-595 and NW 136th Avenue;
- Community Hub located at I-595 and Hiatus Road;
- Anchor Hub located at I-595 and Pine Island Road;
- Community Hub located at I-595 and University Drive;
- Gateway Hub located at SW 30 Street and University Drive;
- Gateway Hub located at SR 7 and I-595;
- Community Hub located at Peters Road and SR 7;
- Community Hub located at Broward Boulevard and SR 7;
- Gateway Hub located at Broward Boulevard and I-95;
- Gateway Hub located at Broward Boulevard and First Avenue;
- Anchor Hub located at Andrews Avenue and 17th Street;
- Anchor Hub located at SR84 and Andrews Avenue; and
- Gateway Hub located at US-1 and the Fort Lauderdale-Hollywood International Airport.

In consideration of the preferences expressed by the TAG and the public and in light of the consultation with the potential operators and stakeholders, it is recommended that the Modified LPA be carried forward for further study in the Environmental Impact Statement (EIS) as the Build Alternative to be evaluated for low-cost LRT, low-cost BRT, and a hybrid that includes a fixed guideway in the eastern portion of the corridor and improved bus-based service in the western portion. The Build Alternative is depicted in Exhibit 30. In spite of the clear preference for LRT, it will be advantageous to review the potential benefits to be gained for a lower-cost option with BRT, particularly in light of the strong preference for BRT by BCT.

Exhibit 30: Potential EIS Build Alternative

Next Steps

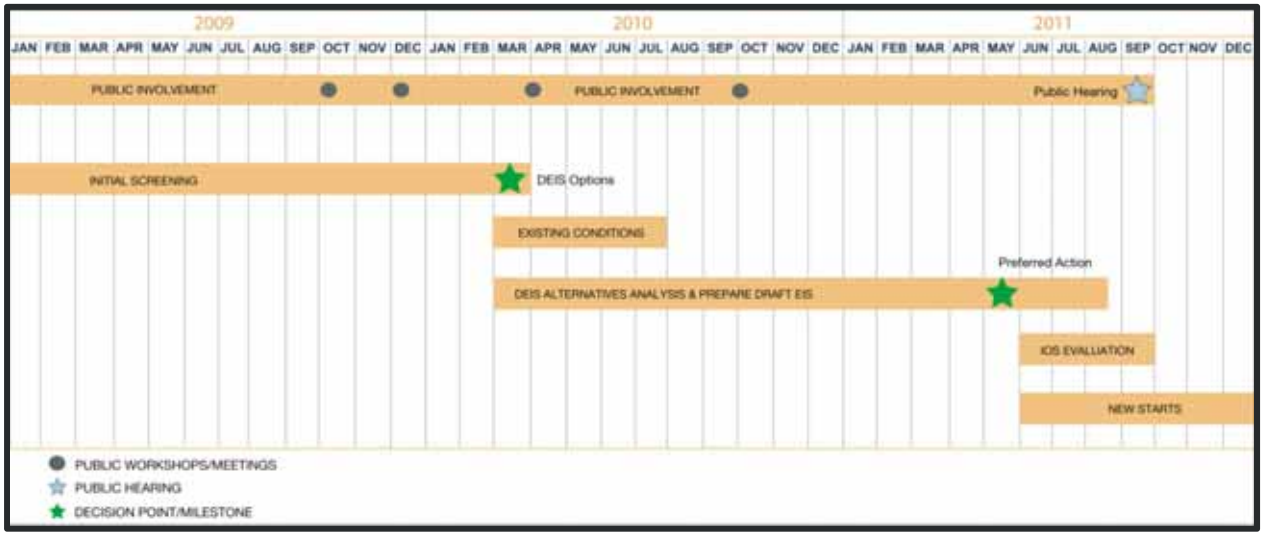
Further definition of the alternatives for the EIS will be conducted in consultation with the TAG, BCT, the SFRTA, and the Broward MPO. This *Definition of Alternatives* will define the No Build, Transportation System Management (TSM)/Baseline, and operating scenarios for the Build Alternative. Once identified, this recommendation and a brief summary of the Evaluation of Scoping Options process and results will be presented to both the Broward County Commission and the MPO Board.

Once concurrence and confirmation on the alternatives to be studied in the EIS is reached, the detailed EIS study phase will proceed. Conceptual engineering of the alignments will be developed for further refinement of the Build alternatives. Alignment and station area planning will be initiated to include the Working Groups developed in part from participants engaged in this Evaluation of Scoping Options.

An on-board transit survey is already underway. This is an important first step to update the travel demand model which will provide important key performance data for the Study and for the New Starts submittal tentatively scheduled for August 2011.

Future milestones for the project are shown below (Exhibit 31) that would lead to a Local Action. This schedule is tentative and could change, particularly in consideration that the Evaluation of Scoping Options stage of project development has taken longer than originally anticipated.

Exhibit 31: Project Milestones



Appendix A: Regional Plans & Systems

Appendix B: Goals, Objectives, Evaluation Criteria, & Performance Measures

Goals/Category	Objectives	Evaluation Criteria	Performance Measures
Travel and Mobility: Enhance east-west mobility in central Broward County.	• Select an alternative that maximizes "system user benefits" as defined by the Federal Transit Administration (essentially, provides the greatest, overall travel time savings in the corridor). • Select an alternative that provides the highest level of accessibility (connects the greatest number of major destinations, e.g., employment nodes, and activity centers: downtown Fort Lauderdale, the South Florida Education Center, Sawgrass International Corporate Park, Fort Lauderdale-Hollywood International Airport, etc.). • Select an alternative that has high ridership potential. • Select an alternative that minimizes disruption to automobile traffic.	Transit ridership potential	Number of daily riders.
			Number of people within one-half mile of potential stations.
			Number of jobs within one-half mile of potential stations.
			Number of new transit riders.
			Average transit trip length.
		Connectivity to major activity & employment centers	Number of major activity centers served.
		Connectivity to transportation system	Number of connections with existing transit services or modes.
		Reduce congestion	Change in person capacity (auto) on east-west arterials compared to baseline (University Drive Screen-line)
			Volume/capacity ratio on east-west arterials (roadway level of service).
Financial and Economic: Efficiently use available financial resources and support economic growth and development.	• Select an alternative that is cost effective in terms of capital cost and operating cost. • Select an alternative that can be operated efficiently in terms of annual operating cost per passenger mile. • Identify the appropriate local implementing agency.	Cost effectiveness	Annualized capital cost and O&M cost per rider.
		Cost efficiency	Annual operating cost per passenger mile.*
		Economic development potential	Potential exists or not (serves RAC, LAC, CRA).
Community: Be consistent with the needs and desires of the residents of Broward County, in order to maximize community acceptance and support.	• Select an alternative that will be endorsed by the municipalities that it will serve. • Select an alternative that will be endorsed by community organizations. • Select an alternative that is compatible to the greatest degree possible with the multiple transit planning and system plans being developed in the area.	Agency/local government support/opposition	Support exists.
		Minority households served	Number of minority households within one-half mile of potential stations.
		Low-income households served	Number of low income households within one-half mile of potential stations.
		Elderly population served	Number of 65+ years old people within one-half mile of potential stations.
		Households that include persons with disability served	Number of disabled people within one-half mile of potential stations.
Land Use: Ensure compatibility between land use policies and transit service so that the need for trip-making and the amount of travel is reduced and the opportunities for transit-oriented development are maximized.	• Coordinate the "premium transit" improvement with existing and planned development and the growth of Broward County in an efficient and sustainable way. • Identify transit-supportive land use policies that are in place in the corridor and affected municipalities. • Identify transit-supportive land use policies that need to be implemented in the corridor and affected municipalities.	Existing development patterns	Level of pedestrian/bicycle access.
		Future land use plans and policies	Level of support for TOD/TOC plans and/or policy initiatives.
Environmental: Enhance and preserve the social and physical environment, and keep potential impacts to sensitive resources to a minimum.	• Select an alternative that has maximum environmental benefit (e.g., greatest reduction in greenhouse gas and ozone precursor emissions, etc.). • Select an alternative that has minimal negative impact on sensitive resources (noise receptors, wetlands, historic resources, etc.).	Wetlands within the transit envelop	Number of wetland areas contiguous to the alignment.
		Parks within the transit envelop	Number of parks contiguous to the alignment.
		Proximate transit facilities	Number of community facilities within quarter-mile of the alignment.
		Listed contaminated sites	Number of listed contaminated sites within quarter-mile of the alignment.
		Threatened and endangered species	Number of threatened and endangered species sites within quarter-mile of the alignment.
		Listed historical and archaeological sites	Number of historical and archeological sites within quarter-mile of the alignment.
		Emissions reduction potential	Reduction in greenhouse gasses (pounds of CO_2 per year).

*O&M costs are for the Scoping Options only and do not include the background bus network.

Appendix C: Goals, Performance Measures, & Raw Results

Goal	Performance Measure	LPA Scoping Option 1	I-95 Scoping Option 2	SR 84 Scoping Option 3	Davie Blvd Scoping Option 4	Sunrise Blvd Scoping Option 5	Griffin Rd Scoping Option 6	Variation to LPA TAG Option 7	Variation to Option 6 TAG Option 8	Oakland Park Blvd TAG Option 9
Travel and Mobility	Number of daily riders.	18,303	15,649	16,007	16,932	19,295	18,866	22,529	22,923	24,341
	Number of people within one-half mile of potential stations.	69,045	58,398	55,620	66,707	82,437	57,906	78,134	76,498	133,696
	Number of jobs within one-half mile of potential stations.	68,327	68,192	70,806	66,785	72,791	89,498	81,307	95,582	79,073
	Number of major activity centers served.	6	6	6	6	6	6	6	6	4
	Number of connections with existing Tri-Rail stations.	1	1	1	1	1	1	1	2	1
	Number of new transit riders.	8,000	7,050	6,700	7,500	8,250	8,600	10,250	10,400	10,550
	Change in person capacity (auto) on east-west arterials compared to baseline.*	2,310	-1,561	104	-649	610	2,861	2,075	3,340	-12,399
	Volume/capacity ratio on east-west arterials.	1.28	1.28	1.28	1.28	1.28	1.28	1.27	1.28	1.29
	Average transit trip length.	6.8	6.9	6.0	7.0	7.1	7.5	6.8	7.0	5.9
Financial and Economic	Annualized capital cost and O&M cost per rider.	$21.07	$25.53	$25.08	$23.15	$20.67	$18.50	$16.91	$16.12	$11.47
	Annual operating cost per passenger mile. **	$0.20	$0.23	$0.23	$0.21	$0.20	$0.18	$0.18	$0.17	$0.17
	Potential exists or not (serves RAC, LAC, CRA).	Excellent	Good	Good	Good	Excellent	Excellent	Excellent	Excellent	Good
Community	Support exists.	Moderate	Unknown	Unknown	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
	Number of minority households within one-half mile of potential stations.	24,679	17,533	15,603	22,510	31,415	9,127	25,757	16,923	51,590
	Number of low-income households within one-half mile of potential stations.	3,004	2,839	2,650	2,966	3,660	1,979	3,521	3,566	5,573
	Number of 65+ years old people within one-half mile of potential stations.	4,473	4,162	3,943	5,593	5,348	3,688	5,321	5,266	10,626
	Number of disabled people within one-half mile of potential stations.	15,953	13,944	13,085	14,469	19,216	10,061	18,153	16,122	33,031
Land Use	Level of pedestrian/bicycle access.	Average	Average	Average	Average	Average	Average	Average	Average	Good
	Level of support for TOD/TOC plans and/or policy initiatives.	Excellent	Good	Excellent	Excellent	Excellent	Good	Good	Good	Good
Environmental	Number of wetland areas contiguous to the alignment.	2	3	3	2	2	3	3	3	2
	Number of parks contiguous to the alignment.	5	7	7	6	5	4	5	5	3
	Number of community facilities within quarter-mile of the alignment.	27	24	27	29	33	25	21	25	27
	Number of listed contaminated sites within quarter-mile of the alignment.	65	59	63	65	66	66	69	66	57
	Number of threatened and endangered species sites within quarter-mile of the alignment.	0	1	1	0	0	3	2	3	1
	Number of historical and archeological sites within quarter-mile of the alignment.	403	412	413	404	405	261	400	261	189
	Reduction in greenhouse gasses (pounds of CO2 per year).	5,671,491	4,965,893	4,402,085	5,419,367	6,262,871	6,534,554	6,998,64	7,319,398	6,579,444
	Low End Total Capital Cost (2009 dollars)	$1,179,504,565	$1,221,765,472	$1,227,639,103	$1,198,845,729	$1,219,689,947	$1,067,252,655	$1,165,357,398	$1,129,933,241	$825,710,724
	High End Total Capital Cost (2009 dollars)	$1,533,355,934	$1,588,295,114	$1,595,930,833	$1,558,499,448	$1,585,596,931	$1,387,428,451	$1,514,964,618	$1,468,913,214	$1,073,423,941
	Annualized Capital Cost (2009 dollars)***	$98,341,193	$101,864,696	$102,354,410	$99,953,763	$101,691,649	$88,982,190	$97,161,673	$94,208,184	$71,217,550
	Annual Operating Cost (2009 dollars)	$6,332,410	$6,319,260	$5,602,969	$6,297,343	$7,027,894	$6,390,854	$7,007,438	$6,998,672	$6,046,034
	Annual Ridership	4,667,265	3,990,495	4,081,785	4,317,660	4,920,225	4,810,830	5,744,895	5,845,365	6,206,955
	Annual Passenger Miles	31,508,285	27,588,297	24,456,030	30,107,595	34,793,730	36,303,075	38,881,380	40,663,320	36,552,465
	Average Trip Length (per passenger, in miles)	6.8	6.9	6.0	7.0	7.1	7.5	6.8	7.0	5.9
	Length (linear distance in miles)	21.5 (approx.)	21.5 (approx.)	21.5 (approx.)	21.5 (approx.)	24 (approx.)	21.5 (approx.)	22.5 (approx.)	22.0 (approx.)	19.8 (approx.)
	Route Length (in miles)	21.48	21.15	24.81	21.38	23.46	21.40	22.22	23.13	19.60
	Total # stations	16	16	16	16	18	16	19	19	20
	Elevated stations	3	3	3	3	3	3	3	2	0
	At-grade stations	13	13	13	13	15	13	16	17	13

Notes:
Capital and O&M costs are based on LRT transit technology only because that is what the ridership was modeled for. LRT was the technology chosen as the LPA. As part of Evaluation of Scoping Options, transit technology will be decided and that will be the basis for the detailed cost analysis as part of the DEIS.
Capital cost estimates are preliminary and do not include right-of-way costs.
*Baseline is University Drive screen-line.
**O&M costs are for the Scoping Options only and do not include the background bus network.
***Annualization factor 0.0725 is based on the following assumptions: 7% discount rate and 50-year design life.

Appendix D: Goals, Performance Measures, & Weighted Scores

Goal	Performance Measure	LPA Scoping Option 1	I-95 Scoping Option 2	SR 84 Scoping Option 3	Davie Blvd Scoping Option 4	Sunrise Blvd Scoping Option 5	Griffin Rd Scoping Option 6	Variation to LPA TAG Option 7	Variation to Option 6 TAG Option 8	Oakland Park Blvd TAG Option 9
Travel and Mobility	Number of daily riders.	4	2	2	2	4	4	6	6	6
	Number of people within one-half mile of potential stations.	4	2	2	4	6	2	6	4	6
	Number of jobs within one-half mile of potential stations.	2	2	4	2	4	6	6	6	4
	Number of major activity centers served.	6	6	6	6	6	6	6	6	2
	Number of connections with existing Tri-Rail stations.	2	2	2	2	2	2	2	6	2
	Number of new transit riders.	4	2	2	2	4	4	6	6	6
	Change in person capacity (auto) on east-west arterials compared to baseline.*	6	2	4	2	4	6	4	6	2
	Volume/capacity ratio on east-west arterials.	6	2	2	4	6	4	6	4	2
	Average transit trip length.	2	4	2	6	6	6	4	4	2
Financial and Economic	Annualized capital cost and O&M cost per rider.	2	1	1	1	2	2	3	3	3
	Annual operating cost per passenger mile. **	4	2	2	2	4	6	4	6	6
	Potential exists or not (serves RAC, LAC, CRA).	6	4	4	4	6	6	6	6	4
Community	Support exists.	4	2	2	4	4	4	4	4	4
	Number of minority households within one-half mile of potential stations.	2	2	1	2	3	1	3	1	3
	Number of low-income households within one-half mile of potential stations.	4	2	2	4	6	2	4	6	6
	Number of 65+ years old people within one-half mile of potential stations.	2	1	1	3	3	1	2	2	3
	Number of disabled people within one-half mile of potential stations.	2	1	1	2	3	1	3	2	3
Land Use	Level of pedestrian/bicycle access.	4	4	4	4	4	4	4	4	6
	Level of support for TOD/TOC plans and/or policy initiatives.	6	4	6	6	6	4	4	4	4
Environmental	Number of wetland areas contiguous to the alignment.	3	1	1	3	3	1	1	1	3
	Number of parks contiguous to the alignment.	6	2	2	2	6	6	6	6	6
	Number of community facilities within quarter-mile of the alignment.	6	2	6	6	6	2	2	2	6
	Number of listed contaminated sites within quarter-mile of the alignment.	2	3	3	2	1	1	1	1	3
	Number of threatened and endangered species sites within quarter-mile of the alignment.	3	2	2	3	3	1	1	1	2
	Number of historical and archeological sites within quarter-mile of the alignment.	2	1	1	2	1	3	2	3	3
	Reduction in greenhouse gasses (pounds of CO2 per year).	4	2	2	2	4	4	6	6	6
	Total Weighted Score	**98**	**60**	**67**	**82**	**107**	**89**	**102**	**106**	**103**
	Goals	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 7**	**Option 8**	**Option 9**
	Travel & Mobility	36	24	26	30	42	40	46	48	32
	Financial & Economic	12	7	7	7	12	14	13	15	13
	Community	14	8	7	15	19	9	16	15	19
	Land Use	10	8	10	10	10	8	8	8	10
	Environmental	26	13	17	20	24	18	19	20	29
	TOTAL SCORE	**98**	**60**	**67**	**82**	**107**	**89**	**102**	**106**	**103**

Notes:
Capital and O&M costs are based on LRT transit technology only because that is what the ridership was modeled for. LRT was the technology chosen as the LPA. As part of Evaluation of Scoping Options, transit technology will be decided and that will be the basis for the detailed cost analysis as part of the DEIS.
Capital cost estimates are preliminary and do not include right-of-way costs.
*Baseline is University Drive screen-line.
**O&M costs are for the Scoping Options only and do not include the background bus network.

Appendix E: Initial Technology Analysis

Goals	Characteristics		Score		Weighting as determined in TAG Meeting #2	Weighted Score	
	LRT	BRT	LRT	BRT		LRT	BRT
Comfort	Less vibration		3	1	2	6	2
	More spacious vehicle						
	Doors available on both sides						
	Larger turning radius						
		Larger and more comfortable seats					
Safety		Faster braking time	2	2	2	4	4
	No possibility of accidental off-route service						
ADA Accessibility	Low floors	Low floors	3	3	2	6	6
	Hydraulic/lift system available	Hydraulic/lift system available					
	Ramps available	Ramps available					
System Capacity	148 passengers	117 passengers	3	2	2	6	4
	Maximum operational speed of 55 to 66 mph	Maximum speed of 45 mph with a full load					
Economic Development	Fixed system leads to more fixed investments		3	1	1	3	1
	Case studies shows higher economic development in areas with implemented LRT over BRT						
Traffic Impacts	Signal prioritization and train warning signals	Signal prioritization and traffic signalization	1	1	1	1	1
	Possible restrictions to left and right turns	Possible restrictions to left and right turns					
Lifecycle Costs (Vehicle only)	*Passengers: 148*	*Passengers: 117*	1	2	2	2	4
	Millions per Vehicle: $3.5	*Millions per Vehicle: $1.2*					
	Vehicle Life (years): 25	*Vehicle Life (years):20*					
	Total vehicle cost per person per year: $946	Total vehicle cost per person per year: $512					
Time Frame		Less roadway impacts	2	3	1	2	3
		Shorter implementation period					
	Requires EIS process	Requires EIS process					
Operational Flexibility		Allows off-route flexibility	1	3	1	1	3
Energy Source	Hybrids available	Hybrids available	3	3	2	6	6
		Total	22	21	NA	37	34

Appendix F: Contextual Technology Analysis

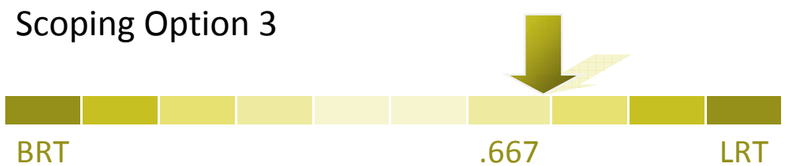
Characteristics: Raw Score	Scoping Option 1	Scoping Option 2	Scoping Option 3	Scoping Option 4	Scoping Option 5	Scoping Option 6	TAG Option 7	TAG Option 8	TAG Option 9
Number of right angle turns	8	8	7	10	10	9	9	10	7
Amount of elevation (miles)	9.47	16.62	16.29	9.47	9.47	6.05	9.49	9.70	0
Amount of elevation (feet)	50,021	87,775	86,037	50,021	50,021	31,960	50,121	51,225	0
Total ridership	18,303	15,649	16,007	16,932	19,295	18,866	22,529	22,923	24,241
Characteristics: Normalized Score	**Scoping Option 1**	**Scoping Option 2**	**Scoping Option 3**	**Scoping Option 4**	**Scoping Option 5**	**Scoping Option 6**	**TAG Option 7**	**TAG Option 8**	**TAG Option 9**
Number of right angle turns	2	2	3	1	1	2	2	1	3
Amount of elevation	2	3	3	2	2	1	2	2	1
Link level ridership	2	1	1	1	2	2	3	3	3
Characteristics: Scale	**Scoping Option 1**	**Scoping Option 2**	**Scoping Option 3**	**Scoping Option 4**	**Scoping Option 5**	**Scoping Option 6**	**TAG Option 7**	**TAG Option 8**	**TAG Option 9**
Number of right angle turns	0.5	0.5	1.0	0	0	0.5	0.5	0	1.0
Amount of elevation	0.5	1.0	1.0	0.5	0.5	0	0.5	0.5	0
Link level ridership	0.5	0	0	0	0.5	0.5	1.0	1.0	1.0
Total average	0.5	0.5	0.67	0.17	0.33	0.33	0.67	0.50	0.67
Propensity of one alignment to a particular technology	Neutral	Neutral	LRT	BRT	BRT	BRT	LRT	Neutral	LRT

Appendix G: Propensity of Technology for Each Option

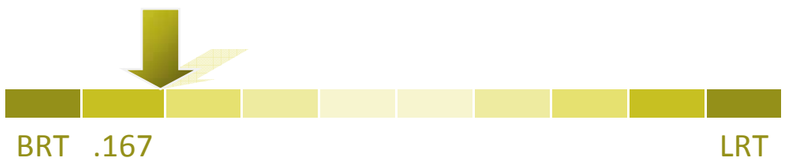
Scoping Option 1

Scoping Option 2

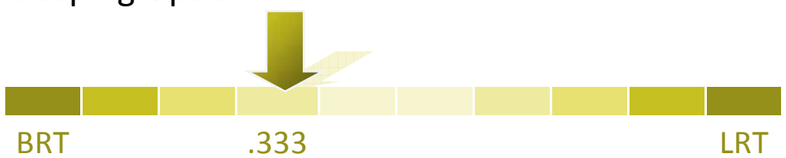
Scoping Option 3



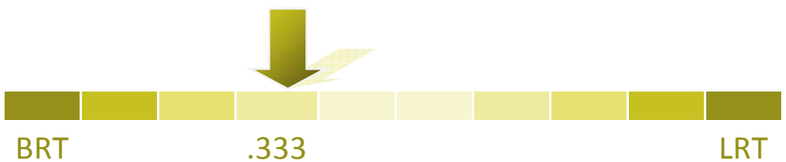
Scoping Option 4



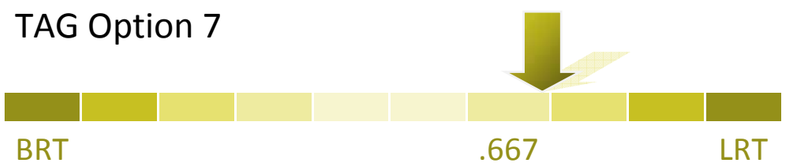
Scoping Option 5



Scoping Option 6



TAG Option 7



TAG Option 8

TAG Option 9