

This section provides an overview of the alternatives developed for implementation during the 10-year TDP. For organizational purposes, the alternatives have been organized into two categories: Status Quo Plan and Vision Plan. Improvements in each category are detailed in this section. The projects in the Status Quo Plan are necessary to keeping the current system operational through the 10-year period. The Vision Plan projects are those that go beyond basic necessities and move the system toward more completely meeting the needs of Broward County residents.

The process to develop the alternatives included consultation with BCT staff, public outreach activities, a needs assessment based on the trend and peer analyses, and input from the ARC and local elected officials. The improvements are need-based improvements and therefore funding may not necessarily have been identified for them. Section 8, Financial Plan, will provide information on the costs associated with these improvements and funding available for them.

Following a description of the potential improvements, BCT provides analyses regarding ridership projections. Two tools are used; one is a Passengers per Hour (PPH) calculation while the other is the FDOT-required ridership model, Transit Boardings Estimation and Simulation Tool (TBEST), analysis.

## STATUS QUO PLAN

The following projects are meant to ensure the current transit system is operational for the 10-year TDP timeframe.

### ***Reliability/Capacity Adjustments***

To improve on-time performance on routes that are experiencing schedule adherence issues, BCT plans to put more buses on the road to allow for greater capacity on the routes. For some routes, it is hard for drivers to maintain the schedule due to traffic congestion, for others it is due to over-crowding which causes performance delays by requiring many stops so passengers can board or alight, or it is a combination of the two. This alternative puts more buses out on the street on these routes in order to allow for better schedule adherence. These improvements are targeted for Routes 1, 10, 18, 22, 34, 36, 50, 72 and 441 Breeze. Map 7-1 provides a map of the affected routes.

### ***New Service - The Wave***

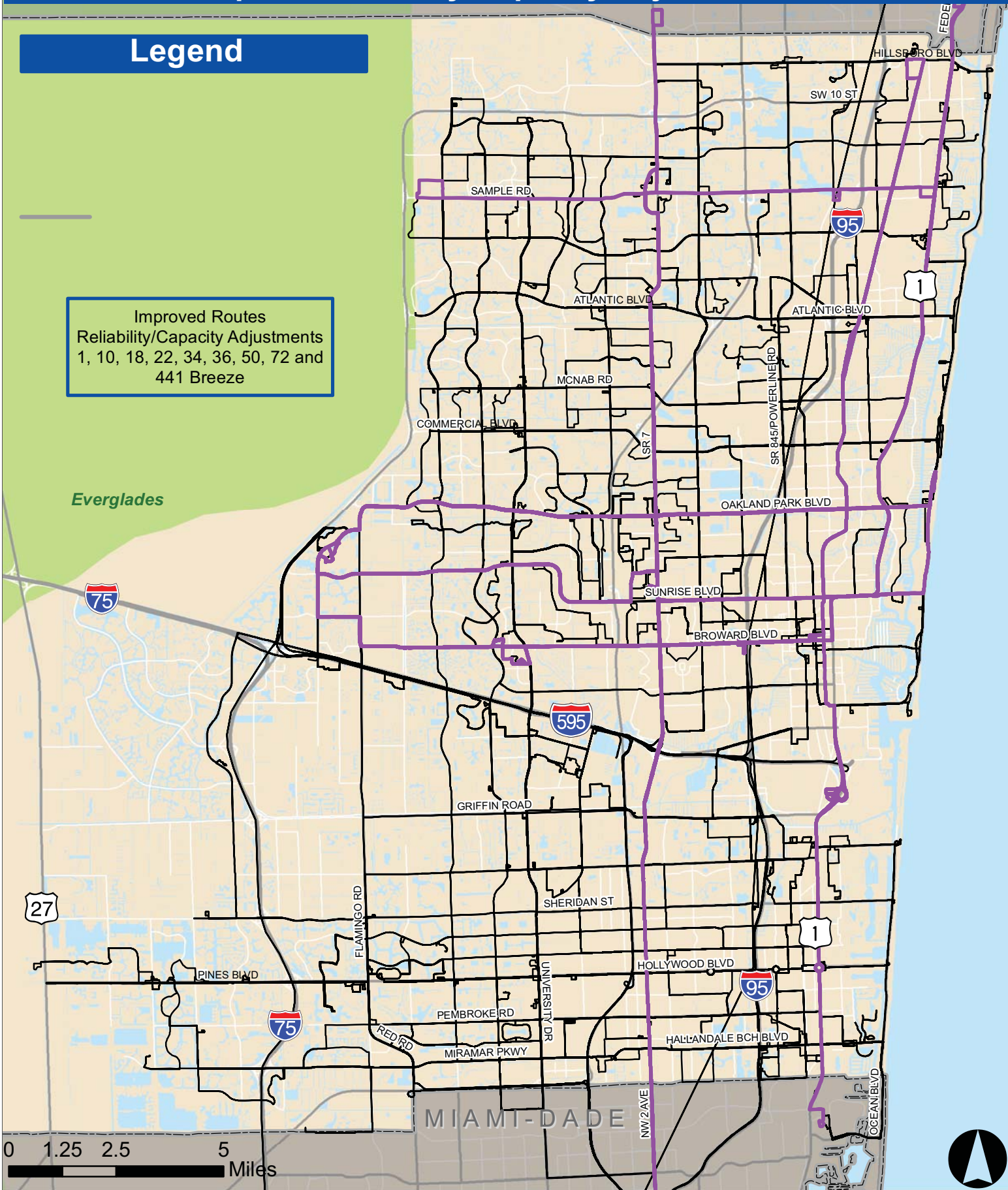
In 2013, the Broward County BCC reiterated its support for providing \$2.5 million annually to operate and maintain The Wave Streetcar system. The Wave Streetcar is a 2.7-mile local circulator planned for downtown Fort Lauderdale. As of August 2013, capital funding has been secured for the construction of the first phase of the project, a 1.4-mile portion that will extend from the Broward Central Terminal south to the Broward Courthouse area.

# Map 7-1 Reliability/Capacity Adjustments

## Legend

Improved Routes  
Reliability/Capacity Adjustments  
1, 10, 18, 22, 34, 36, 50, 72 and  
441 Breeze

Everglades



The initial line will provide circulator service in downtown Fort Lauderdale between 10 stations, with proposed 7.5-minute headways on weekdays and 15-minute headways during evenings and weekends. Following the construction of this initial 1.4-mile line by SFRTA in late 2016, BCT will become the owner and operator of the system.

The Wave Streetcar aims to create a livable community by integrating existing and planned transit-supportive land use, transportation, economic development, and environmental sustainability decisions in downtown Fort Lauderdale. By providing rail circulation between surrounding neighborhoods and downtown residents, and for regional transit users utilizing the Broward Terminal and connectivity to major employers, the WAVE Streetcar will accelerate the livability of the downtown and areas along the line.

#### ***Vehicle Replacement – Fixed Route***

Each vehicle in the BCT fleet has a certain useful life and will need to be replaced when its useful life comes to a close. For the larger vehicles used on fixed route services, the useful life is about 14 years. Based on the age of BCT's current fleet and their replacement cycles, BCT developed a Fixed Route Fleet Replacement Plan.

#### ***Vehicle Replacement – Community Bus***

As vehicles in the Community Bus system reach their useful lives and need to be replaced, BCT will begin to replace some of them with larger 30-foot buses. These larger buses will alleviate some of the overcrowding occurring in routes in these areas and allow for ridership growth with added capacity. Larger buses will be purchased for routes in Lauderdale Lakes, Lauderhill, Hallandale Beach, Pompano Beach, Deerfield Beach, Davie, and Fort Lauderdale.

#### ***Vehicle Purchase - Paratransit***

BCT currently contracts out paratransit service, which includes the ownership of paratransit vehicles. BCT will slowly acquire paratransit vehicles in order to negotiate a new contract to allow for BCT to own the vehicles while a third party maintains and operates them. As such, BCT plans to purchase 234 new paratransit vehicles over the next one to two years. By moving to BCT ownership, equipment specific to BCT and its operations that is installed on the vehicle can be maintained on a vehicle even if the contract for paratransit operations changes between vendors. This avoids the situation where BCT is installing its equipment on vendor-owned vehicles. It also allows BCT to employ a better ratio of capital funds versus operating funds.

#### ***Cypress Creek Tri-Rail Station Access Improvements***

Currently, the BCT station that serves the Cypress Creek Tri-Rail Station is across Andrews Avenue from the Tri-Rail station. In order to improve access for transferring passengers, BCT needs to realign the

routes in that area to enter the Tri-Rail area directly. The improvement will require a redesign and improvement of access roads into the Station as well as the purchase of three new vehicles to facilitate the realignment of routes serving the station.

#### ***Lauderhill Mall Transit Center***

A new transit center is needed at Lauderhill Mall to accommodate community shuttle buses, 40-foot vehicles, 60-foot vehicles, restroom facilities, and ticketing areas. The facility is scheduled for FY 2014. The facility will continue to serve Routes 18, 36, 40, 441 Breeze, and 81 as well as Community Bus routes from Lauderhill, Lauderdale Lakes, and Plantation.

#### ***Park-and-Ride Lots***

Two park-and-ride lots are planned for the near future: Miramar and Westgate. The Miramar facility will service I-95 Express Routes and the Westgate facility will serve I-595 and I-95 Express routes.

#### ***Copans Road Facility Administrative Building #4 Rehabilitation***

BCT's Building #4 on its current Copans Road Maintenance and Operations Facility will be rehabilitated in 2014 in order to better house BCT's overall Operations Department.

#### ***Copans Road Maintenance and Operations Facility Rehabilitation/Upgrade***

The Copans Road Operations and Maintenance Facility campus currently in use needs to be upgraded, modernized, and expanded. It is expected that these improvements will allow the capacity for 80 additional buses.

#### ***B-Cycle Expansion***

Broward B-Cycle launched on December 14<sup>th</sup>, 2011, with 20 stations in three cities (Hollywood, Fort Lauderdale, and Pompano Beach). Within its first year, the program grew to a total of 26 stations with the addition of stations in the cities of Dania Beach, Hallandale Beach, and the Town of Lauderdale-by-the-Sea. The 275-bike system now has 27 stations in six cities within the County with additional stations to be added. Since Broward B-Cycle launched, over 29,809 riders have taken more than 45,000 bike rides, saving more than 7,700 gallons of gas, offsetting more than 143,000 pounds of carbon emissions, and burning more than 5.9 million calories.

Bikesharing offers residents and visitors an alternative and active form of public transportation, which is good for their health, environmentally friendly, and affordable. BCT estimates that a minimum of two additional stations per year will facilitate more uses of the system if stations are placed in favorable locations. Locations of future stations will be based on connectivity with other B-Cycle Stations, area uses with higher ridership potential, local codes or other permitting requirements/regulations, and funding availability.

***Bus Shelter/Stop Replacement***

BCT will complete its first major bus shelter expansion plan by the end of FY 2014. Once completed, over 1,000 BCT bus stops throughout the county will have some type of bus shelter. Beyond FY 2014, BCT anticipates a minimum of fifty new bus shelters and/or upgraded bus stops per year where feasible.

***Computer-Aided Dispatch/Automatic Vehicle Locator/Single Sign-On/Real Time Passenger Information System***

BCT has an existing Computer-Aided Dispatch/Automatic Vehicle Locator (CAD/AVL) system that helps manage fleet operations, track vehicle movements, and facilitate communication. Working in conjunction with this system is the agency's Automatic Passenger Counter (APC) technology, which counts passengers as they board and leave buses, and Voice Annunciation System (VAS), which gives English/Spanish/Haitian Creole on-board automatic voice announcements for major stops, transfer points, landmarks, and safety advisories. BCT is currently working toward replacing the existing system with enhanced capabilities including Real-Time Bus/Passenger Information System, Yard Management System, and other beneficial functions. The real-time information system will provide patrons with accurate bus arrival information and allow them to plan their travel more efficiently. It also will help BCT staff support the agency's operational activities. The new system is expected to be deployed in FY 2015, with planned system upgrades subsequently occurring in FY 2017 and FY 2020.

***AssetWorks Fleet Anywhere (FA) Suites***

Fleet Anywhere from AssetWorks is a computer-based fleet management system that tracks all functions related to the inventory and the maintenance of vehicles and equipment. For a transit agency, it can help staff process repair and preventive maintenance work orders, capture operating expenses by maintenance category, manage the parts inventory, and track warranty schedules and repairs, among other capabilities. After implementation in FY 2013, BCT will need to upgrade the system in FY 2018.

***Fare System Interoperability (Open Fare Payment System)***

BCT's current fareboxes allow the agency to accommodate electronic fare payment, whereby electronic communication, data processing, and data storage techniques are used to automate manual fare collection processes. To further enhance the fare payment process and make it even more convenient for patrons, BCT will be pursuing the integration of Smart Card technology to these devices, which would also support the ongoing fare interoperability efforts in the region and allow for the transferability of fare payments across transit systems in Southeast Florida (e.g., Miami-Dade Transit's Easy Pass program). It is estimated that this project would be completed in FY 2016. In addition, BCT is also researching the potential feasibility of an open fare payment system (e.g., "Mobile Ticket" technology) to further expand the array of payment methods that it can offer to riders. BCT will participate in a pilot project in partnership with Palm Tran and then proceed with full deployment based on the outcome of the pilot.

***Personal Computer Replacement and Growth***

Like all other capital equipment used by a transit agency, computer and technology-related equipment has a distinct life cycle and must be maintained and replaced accordingly. BCT intends to develop and maintain a scheduled replacement plan and to support any future personnel increases. Such a plan will allow the agency to ensure that it has an up-to-date and functional computer and technology infrastructure to support its services and operations in an ongoing fashion. This will be an annual priority project for BCT for FY 2015-23.

***eLearning Solution for Computer-based Training (CBT)***

BCT will implement an internal e-learning solution for Transit Operations & Maintenance employees focusing on service and operation improvements in FY 2015. This initiative will enable BCT to conduct ongoing CBT as needed.

***Closed Circuit Television (CCTV) - Campus Surveillance System***

BCT plans to upgrade to Internet Protocol (IP) Camera Technology from coaxial Point to Point in FY 2015, where possible. This upgrade will also include expanded channel counts for Digital Video Recorders as a part of the life cycle replacement program.

***On-Board Vehicle Surveillance System***

BCT has been using an on-board, closed circuit camera surveillance system on its buses since 2010. The system is used to record passenger and operator behavior, help deter crimes and disruptive behavior, and boost the overall safety and security of the vehicles while in service. The surveillance system recordings provide BCT staff with the ability to review occurrences for investigative and risk management purposes. A desired add-in, Live Look-in, is planned for acquisition in FY 2013, which will provide the additional capability to view and listen, in real-time, to the activities occurring on any one of the equipped BCT buses. This additional capability will enable transit, law enforcement, and security personnel with the ability to better assess situations as they unfold, thereby helping the agencies devise and implement appropriate responses. Thereafter, the entire camera system will be slated for an upgrade or replacement in FY 2016.

***Real-Time Information Monitors at Employee Facilities (Digital Signage)***

BCT intends to implement real-time information monitors at its major transit employee facilities. The monitors will be used to provide training, internal news, and job related information to the transit staff in FY 2015.

***Trapeze Midas-BD Bidding & Dispatching Software***

BCT currently uses Midas-Bidding and Dispatch Software, a vendor provided software package, to manage its operator bidding processes, operator dispatching, and timekeeping function. This workforce management software tool is slated to be upgraded or replaced in FY 2016.

***Genfare Odyssey Electronic Validating Fareboxes***

BCT's bus fleet is equipped with electronic validating fareboxes used to accept fares and bus passes. These fareboxes, have a built-in electronic identification system that can accept and validate coins, tokens, and bills. They also have the capability to accept and process magnetic fare cards; accept, issue, and validate electronic transfers. BCT has planned a replacement for the fareboxes in FY 2016-17 which will follow the Fare Systems Interoperability project.

***Business Continuity***

BCT intends to establish a backup Disaster Recovery Site to the existing Category 5 Rated Data Center site in FY 2015.

***Security Assessment***

After deployment of key Strategic Initiatives in FY 2015 (e.g. CAD AVL), BCT will initiate a Security Assessment and Evaluation for Cyber/Network Security Risk and recommended actions for mitigation in FY 2016-17.

***Radio Lifecycle***

As a part of Lifecycle replacement, BCT will replace the existing radios with newer technology based on technology advancements in FY 2017 and FY 2021.

***Paratransit Virtual Desktop***

BCT intends to virtualize paratransit personal computers to clientless technology and upgrade backend infrastructure in FY 2014. Upgrades of the hardware and software will be considered in FY 2019.

***Real-Time Information for Downtown Kiosks***

The Fort Lauderdale DDA, in a pass through arrangement with BCT, is enhancing the provision of transit services in the downtown area by strategically placing kiosks that would provide real-time bus schedule information for the local BCT routes serving this area. Real-time bus schedule information technology is designed to improve customer service by disseminating timely and accurate service information about projected bus arrival and departure times, disruptions and delays, transfers, and other transportation services at key locations. BCT will be coordinating with the DDA on its implementation of the kiosks so that they can be coordinated with the transit agency's planned real-time information system deployment in FY 2015.

***Wi-Fi Hardware Upgrade on Express/Breeze Buses***

BCT's current Express and Breeze bus services provide patrons with Wi-Fi on-board the vehicles to help accentuate the premium nature of these services. The existing Wi-Fi hardware on the vehicles is in need of upgrade to make the Wi-Fi service more reliable. BCT is still working on the schedule for this particular improvement; however, it is clear from staff that the agency's 10-year vision includes Wi-Fi only for Breeze, Express, and all other future premium bus services and not the entire fleet.

***Workers Compensation Upgrade***

BCT will upgrade the existing system in FY 2015 to provide employees with first level reporting of on-the-job injuries and track standard NCCI codes for reporting.

***Document Management System***

By implementing a document management system in FY 2015, BCT will be able to reduce the storage requirements for physical documents, enhance productivity; reduce paper printing and convert e-File for easy access. BCT will be able to store a version history of all documents and record change logs. An upgrade of the system is programmed for FY 2019.

***Video Conferencing***

Video conferencing capabilities will improve communications between BCT staff and will reduce the need for travel to and from BCT or County office locations, further enhancing productivity levels across dispersed workforces and teams in all BCT departments. Video conferencing equipment would only be installed at select locations and is scheduled for implementation in FY 2015.

***Net Backup and Network Upgrades***

BCT will maintain and upgrade backup and recovery systems along with Network Upgrades which will increase bandwidth for ease of access. These upgrades are scheduled for FY 2015.

***End of Life Server Replacement***

BCT plans the development of a Life Cycle Replacement Plan for server infrastructure, which would include cost estimates and procedures for end-of-life replacement, as well as upgrades and maintenance of software and hardware components where necessary. This will be an annual priority project for BCT for FY 2015-23.

***The Wave Streetcar Technology Needs***

The Wave Streetcar system is expected to be operational in late 2016 and includes a number of Advanced Public Transportation System (APTS) technologies to attract and assist riders and make their travel experience more convenient. Among the technology needs for which BCT will need to plan in conjunction with system start-up are real-time information monitors, information kiosks, video cameras, APCs, AVLS, automated annunciators, and potential signal priority applications, among other elements.

***Community Bus Technology Needs***

The aforementioned CAD/AVL/APC/Annunciation system upgrade that BCT is planning for FY 2015 will benefit the agency's existing local and premium bus services. The upgrade will also be expanded to the Community Bus service as necessary to ensure compatibility of technology and operations across all modes/services. This technology expansion to the Community Bus vehicles will occur sometime after the overall system upgrade has been completed and will be accommodated by new vehicle purchases for the program, as well. Exact costs for this need are to be determined in future years.



***Transit Signal Priority Implementation***

TSP is a technology strategy that gives buses preference at selected traffic signals when they arrive at the intersections, potentially dependent on some set of pre-established conditions. Since signal delay presents a major impact to bus operations, this technology has the potential to help BCT better maintain its bus schedules on key corridors with minimum impact on cross street traffic. To this end, FDOT and BCTED have been working in conjunction with BCT in a pilot project to test the technology and assess its potential uses, benefits, and impacts. To date, TSP is not widely used; however, BCT is interested in expanding the application of the technology to major corridors across the county in coming years as part of its 10-year vision. A future expansion plan will need to be developed.

The expansion of TSP will likely occur on a corridor-by-corridor basis following detailed transit corridor studies such as those being scheduled, underway, or completed on Broward Boulevard, Oakland Park Boulevard, University Drive, and US 1. Corridors such as Hollywood/Pines Boulevard, State Road 7/US 441, and Hallandale Beach Boulevard will also have more detailed corridor planning in the next one to three years. An estimated cost for TSP deployment is factored into the overall capital costs of Enhanced Bus service (see Table 7-1).

***Additional IT Personnel and IT Temporary Staff***

Any organization with a robust technology infrastructure will require an equivalent IT staff with which to maintain it. This equivalence matters in both the quantity and the quality of the staff. Given BCT's commitment to customer-service-based technology as well as its planned enhancements, it also will be prudent for the agency to develop an IT staffing plan to ensure appropriate and sufficient support for both current and new/upgraded equipment with the proper mix of permanent and temporary staffing. This staffing plan will be developed in FY 2014 and adjusted annually as different technologies become imbedded in BCT's day-to-day business.

***Maintenance and Support Services***

BCT continues to provide IT Support Services for routine maintenance, security services and upgrades of software and hardware systems through various vendor agreements. Needs under this category will remain an annual priority for BCT for FY 2015-23.

***Software Tools and Database Licenses***

BCT will continue to maintain compliance with software license agreements for databases and programs such as Business Objects, Crystal, and Toad that are used for various support and project related functions. Needs under this category will remain an annual priority for BCT for FY 2015-23.

***Real Time Communications (Service)***

With the implementation of the new CAD/AVL System, Real Time Communications requirements will increase. The additional carrier services are accounted for within this line item. Needs under this category will remain an annual priority for BCT for FY 2015-23.

***Comprehensive Operational Analysis***

A COA will examine the operational aspects of the current system and determine changes that would improve efficiencies and better address changing rider needs. COAs make recommendations that range from schedule alterations, route realignments, new service needs, and other operationally-based improvements that enhance the customer experience and increase ridership. BCT will fund and development an updated COA every five years, with FY 2014 and FY 2019 as the target years.

***Park-and-Ride Lot Study***

BCT will conduct a market analysis study to determine the need for park-and-ride lots for current or planned Express Bus services. At a minimum, the study will need to identify available parcels, including parcels currently owned by governmental entities, locations or development opportunities that provide optimal access and amenities that are attractive to BCT's customers, and sites that encourage or are part of local or regional transit-supportive land use developments. This study will include a solid review of all past, current, or future park-and-ride and/or hub development studies completed by a municipality, the Broward MPO, FDOT, or other parties as needed.

***Intermodal Facility Study***

BCT intends to build a new downtown Fort Lauderdale intermodal facility by FY 2016 as well as up to six new intermodal transfer facilities around Broward County. A study is needed to determine the best available locations for these new facilities collectively.

***ADA Accessibility Study***

In order to ensure BCT is in continued compliance with the ADA, BCT will complete an ADA accessibility study. An accessibility study with a prioritization plan will assist BCT in understanding what needs to be done throughout the system to remain compliant with ADA.

**VISION PLAN**

The following improvements are intended to improve the transit system beyond its current capabilities, level of service, and current funding levels.

***Frequency Improvements***

Frequency improvements, also called headway improvements, are needed on many routes to

accommodate demand for more service. Frequency improvements generally include the reduction in headways. Most headway adjustments in this plan are to provide 10-, 20-, or 30-minute headways. Frequency adjustments are based on existing demand for the service coupled with estimated demands for service through FY 2023. Demand was estimated using the PPH methodology and TBEST as described later in this section. Frequency improvements are needed for Routes 1, 2, 7, 10, 14, 18, 28, 30, 31, 34, 36, 40, 42, 50, 55, 60, 72, 81, 108X, and 109X. Map 7-2 provides a map of the affected routes.

### ***Service Span Improvements***

Service span improvements extend service later in the evening, extend service earlier in the morning, add service during mid-day, or add service on the weekends on routes that are currently in operation. Service span improvements are targeted for 35 routes: 1, 2, 6, 7, 9, 10, 11, 12, 14, 15, 16, 18, 20, 22, 23, 28, 30, 31, 34, 36, 40, 42, 48, 50, 55, 56, 60, 62, 72, 81, 83, 88, 108x, 109x, and 441 Breeze. Map 7-3 provides a map of the affected routes.

### ***Route Realignments***





Several routes will be re-aligned, extended, or truncated in order to improve efficiency of operations or better serve passengers. For example, Routes 14, 60, and 62 are scheduled to be realigned to directly serve the new bus terminal at the Cypress Creek Tri-Rail Station. This improvement will allow passengers to board and alight from BCT routes without having to cross a major roadway to access the Tri-Rail station. Other realignments for Routes 9, 11, 12, 20, 42, 48, 55, 81, 108X, and 109X are detailed in the service plan found in Appendix L. Map 7-4 provides a map of the affected routes.

### ***New Service - Enhanced Bus***

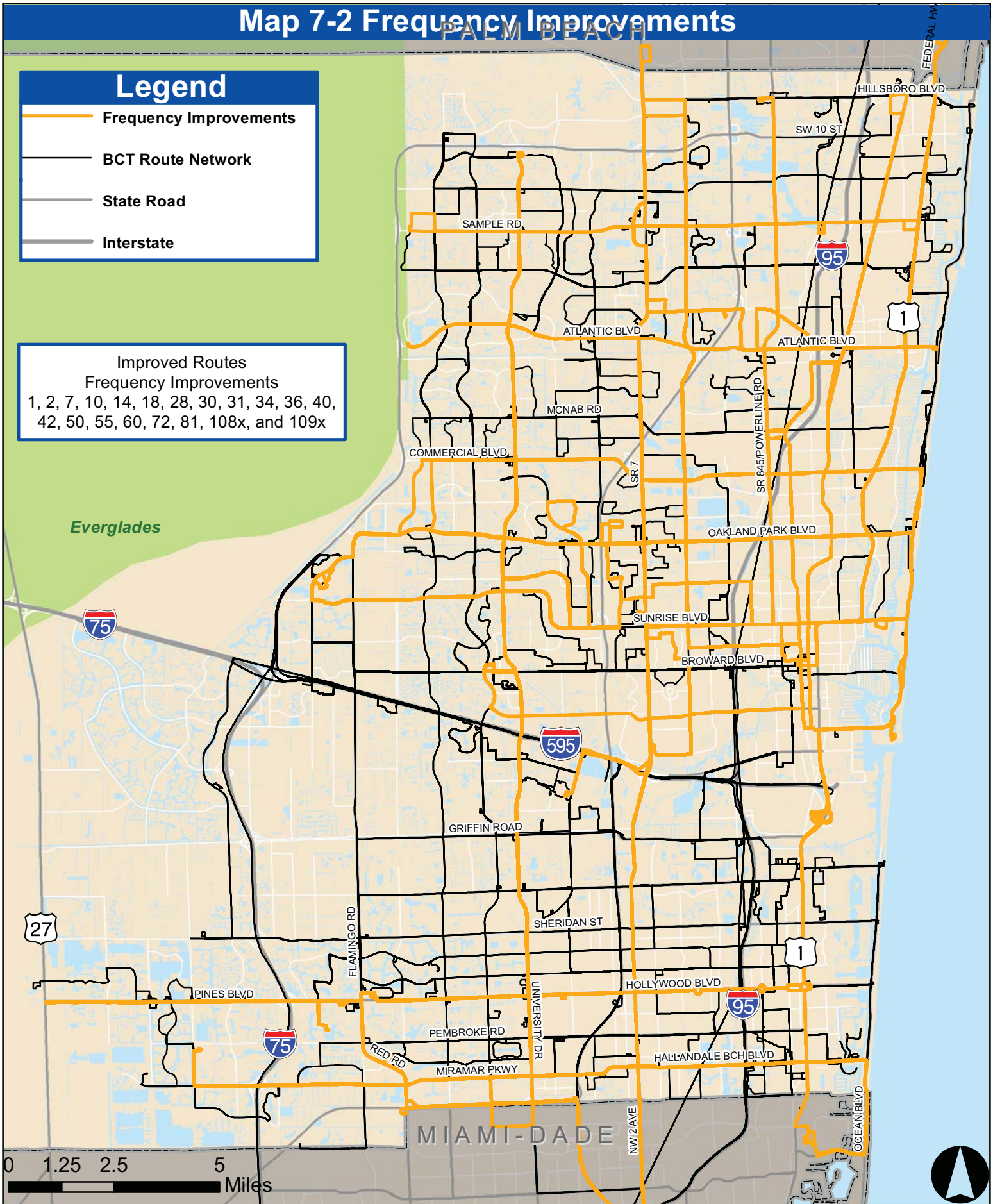
BCT will implement a number of Enhanced Bus routes during the TDP timeframe. The planned Enhanced Bus layer of service is different than the current limited stop BCT Breeze service. Enhanced Bus is characterized by providing a higher level of service than the current Breeze service, including the additions of transit service enhancements such as real-time information signage, more frequent service (10- to 15-minute headways during the peak periods), TSP, branding, and station amenities such as payment kiosks. The Table 7-1 provides an overview of these routes while Map 7-5 displays their alignments. The Enhanced Bus routes will replace Breeze routes operating in the corridor, but the local fixed route service layer will continue in each corridor.

# Map 7-2 Frequency Improvements

## Legend





-  Frequency Improvements
-  BCT Route Network
-  State Road
-  Interstate

Improved Routes  
 Frequency Improvements  
 1, 2, 7, 10, 14, 18, 28, 30, 31, 34, 36, 40,  
 42, 50, 55, 60, 72, 81, 108x, and 109x



# Map 7-3 Service Span Improvements

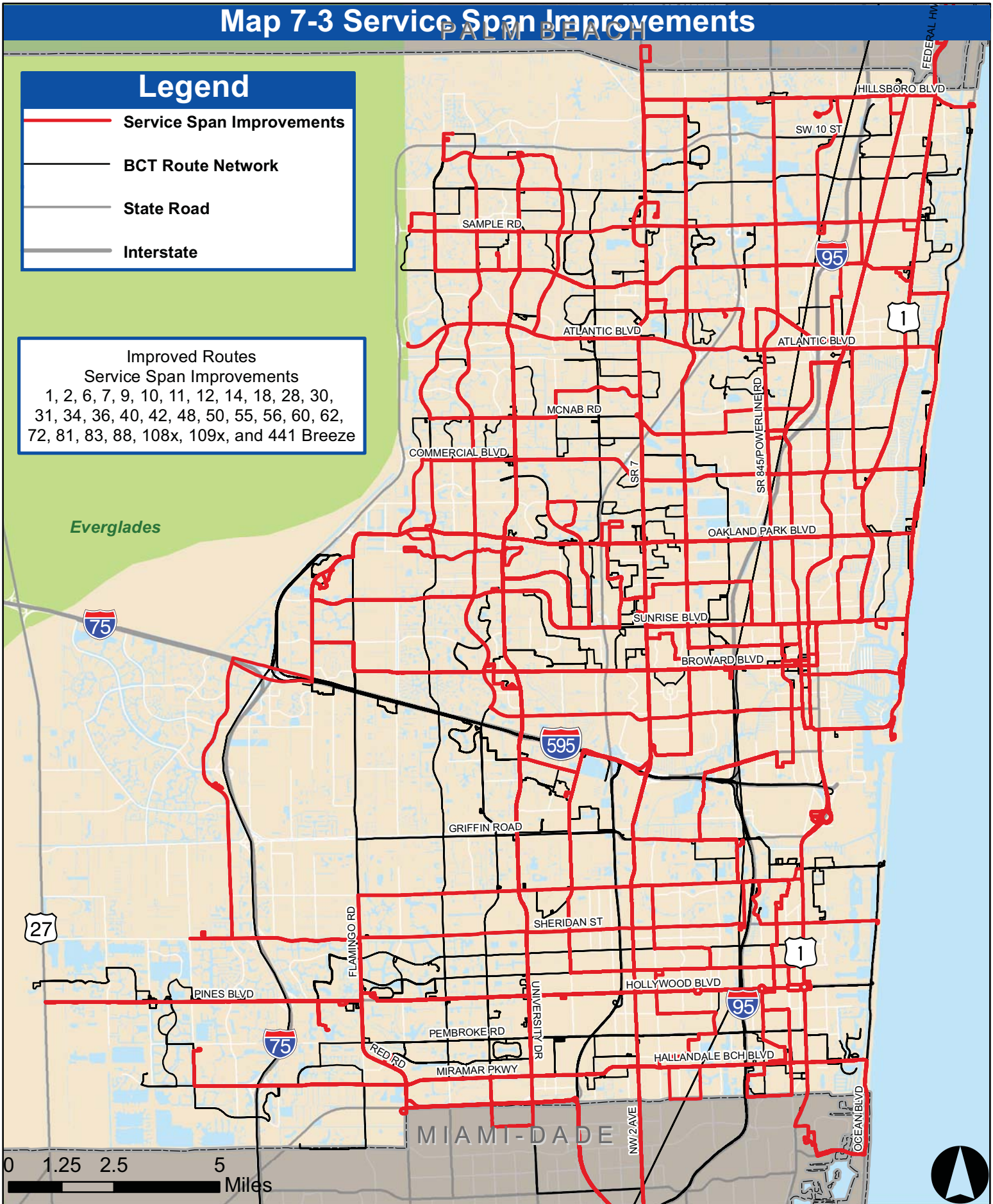
## Legend

-  Service Span Improvements
-  BCT Route Network
-  State Road
-  Interstate

### Improved Routes

#### Service Span Improvements

- 1, 2, 6, 7, 9, 10, 11, 12, 14, 18, 28, 30, 31, 34, 36, 40, 42, 48, 50, 55, 56, 60, 62, 72, 81, 83, 88, 108x, 109x, and 441 Breeze



# Map 7-4 Route Realignments

## Legend

Improved Routes  
Realignments  
9, 11, 12, 20, 42, 48, 55,  
81, 108x, and 109x

Everglades



The priority of each Enhanced Bus route was determined via an analysis of current levels of demand on each corridor (current and projected PPH) coupled with estimated demand (TBEST) by FY 2023. Demand was estimated using the PPH methodology and TBEST as described later in this section. It should be noted that any exact service plan and terminus of Enhanced Bus routes on each respective corridor will depend on the completion of a robust transit corridor study, an extensive on-board/origin-destination survey, and a clear analysis of the market demand and need for such planned activities.

**Table 7-1**  
**Enhanced Bus Routes**

Primary Corridor	Terminus #1	Terminus #2	Implementation Year (Fiscal Year)
US 441	Sandalfoot Boulevard	Golden Glades	2017
Oakland Park Boulevard	Sawgrass Mills Mall	State Road A1A	2018
Federal Highway (US 1)	Broward Terminal	Aventura Mall (Miami-Dade County)	2019
University Drive	Sample Road	Golden Glades	2020
Broward Boulevard	Sawgrass Mills Mall	Broward Terminal	2021
Sunrise Boulevard	Sawgrass Mills Mall	SR A1A	2022
Pines/Hollywood Boulevard	Pembroke Lakes Mall	Young Circle	2023
Sample Road	Coral Ridge Drive	Federal Highway (US 1)	2023

#### ***New Service - Express***

BCT would like to expand express bus service in the I-75 corridor in southwest Broward County and into Miami-Dade County. Currently, FDOT has listed the operating funding needed to operate an I-75 Express route in its latest Work Program for FY 2018. Although an operating agency has not been identified for utilization of these funds, BCT will be prepared to seek this funding to provide an express bus connection between Broward County (I-595/I-75 area) to the job center(s) in and around the Miami-Dade International Airport (MIA). Service would operate during the weekdays on 30-minute headways beginning in FY 2018 and use the Managed Lanes soon to be under construction on I-75.

#### ***New Service - Fixed Route***

Scheduled for implementation in FY 2020, new local fixed route service on Nob Hill Road is planned between Broward Boulevard and Holmberg Road. Also in FY 2020, service is planned for McNab Road and Cypress Creek Boulevard between Federal Highway and Hiatus Road. Both of these routes are planned to operate with 30-minute frequencies during the weekday peak period and 60-minute frequencies during the off-peak weekday and weekend periods.

# Map 7-5 BCT Improvements

## Legend

- Reliability/Capacity Adjustments
- Realignment
- Frequency Improvements
- Service Span Improvements
- Current Bus Routes
- State Road
- Interstate





***New Service - Community Bus Improvements***

There are a number of Community Bus improvements planned for the next 10 years. One priority is to improve the frequency of all routes to at least 60-minute headways by FY 2023. This would positively benefit routes in Davie (Green), Miramar (Green, Red, Yellow, Orange), and Pembroke Pines (Blue West). In addition, BCT received a number of requests from participating and community bus partners for new or expanded service by FY 2023. These municipalities include Fort Lauderdale, Hallandale Beach, Hillsboro Beach, Lauderdale-by-the-Sea, and Lauderdale Lakes. Lastly, BCT has recently received unfunded service requests from new partners, including Hollywood, Sunrise, and West Park. In total, BCT anticipates that all of these improvements will provide better service for local residents trying to circulate within their respective area as well as provide better connectivity to the rest of the BCT system.

***Downtown Intermodal Center***

The introduction of passenger rail on the FEC Railway corridor has been proposed by both the FEC, Inc.'s All Aboard Florida (AAF) and SFRTA's Tri-Rail Coastal Link/SFFEC projects. Both of these efforts identify BCT's Broward Central Terminal (BT) site and surrounding parcels as a potential major passenger rail station for FEC passenger rail corridor service. In addition, it is expected that the development of The Wave Streetcar alignment and potential maintenance facilities near the BT offer further multimodal connections in and around the BT. In total, all of these forthcoming passenger rail efforts offer tremendous opportunity for redevelopment of the BT site, such as public-private joint development in and around the BT site, and an exciting opportunity for all transit users to have a world-class array of transit services and related amenities in one site or area. Further redevelopment plans for the BT and surrounding parcels will continue through FY 2016. At this time, exact plans, designs, costs, and funding sources for all potential changes to this site and surrounding area are not yet identified.

***Maintenance/Operations Facility***

Once BCT is able to access a dedicated funding source to increase the number of vehicles in its fleet per the TDP Vision Plan, a third maintenance/operations facility will need to be constructed to accommodate the expanded fleet. An exact location for this facility is to be determined.

***Park-and-Ride Lots***

Beyond the facilities planned in Miramar and Westgate, other park-and-ride lots are also needed. A study to determine locations and sizes will be undertaken.

***Transit Intermodal Centers***

BCT estimates that the expanded system as detailed in the TDP Vision Plan may require the development of additional intermodal transit centers to accommodate transfers between BCT services and other modes. Future locations of such intermodal centers remain unidentified at this time. Such locations will depend heavily on a number of factors that BCT will monitor, such as the likely progress of

transit-supportive land use developments, future regional express bus or passenger rail investments, or specific operating needs within BCT’s system.

***Pedestrian/Complete Streets Improvements***

BCT is committed to improving the passenger experience by improving pedestrian connectivity with BCT services. Pedestrian improvements such as the addition of connecting sidewalks or other access improvements will remain a perennial investment for BCT, particularly around existing BCT bus stops. In addition, BCT will continue to partner with other Broward County departments, municipalities, and FDOT on initiating and completing Complete Streets projects that also will enhance the BCT passenger experience.

***BCCB Contractual Reorganization***

Over the next several years, BCT will work with its local community bus partners to create two or three standard contractual agreements for providing community bus service. At present, there are 18 different contracts that BCT must administer. In adherence with FTA policy, BCT will move toward the use of a much smaller number of standardized contracts.

***Driver Training***

Recent complaints filed by passengers have suggested that drivers need ongoing training to ensure they are following proper procedures with regard to ADA assistance, safety, and etiquette. Drivers are the primary source of interaction with BCT riders so they need to be trained to assist passengers.

***Business Analysts***

BCT would like to add between up to six business analysts to its staff over the next 10 years. Business analysts will assist the agency with detailed budgetary, service planning, and operational analysis.

**RIDERSHIP PROJECTIONS**

Two ridership projection tools were used to prioritize improvements. The first, a PPH analysis, uses historical ridership rates and growth rate to project future ridership levels. The second, TBEST, is the FDOT-required method for projecting ridership impacts from changes to a transit network.

**PASSENGERS PER HOUR ANALYSIS**

BCT staff conducted an analysis of projected PPH by route in order to determine which routes might be ready for more premium level service in the future. By looking at passenger loads, BCT can better determine if a bus is standing room only such that more service on the route may be required. BCT staff started with current PPH levels on the network and then assumed a 1.5 percent annual growth rate.

Table 7-2 displays the passengers per hour by route and time of day. It is color-coded to indicate differing levels of ridership.

On Table 7-2, green font indicates ridership levels above 50 PPH, red font indicates ridership levels above 60 PPH, and purple font indicates ridership levels above 70 PPH. These levels are such that greater service on the route may be necessary to avoid overcrowded and standing room only conditions.

## TBEST MODELING

Ridership forecasts were prepared using the FDOT-approved transit demand forecasting tool, TBEST. TBEST is a comprehensive transit analysis and ridership-forecasting model that is capable of simulating travel demand at the individual route level. The software was designed to provide near- and mid-term forecasts of transit ridership consistent with the needs of transit operational planning and TDP development. In producing model outputs, TBEST also considers the following:

- *Transit network connectivity* – Refers to the level of connectivity between routes within the bus network. The greater the connectivity between bus routes, the more efficient the bus service becomes.
- *Spatial and temporal accessibility* – Refers to service frequency and to distance between stops. The larger the physical distance between potential bus riders and bus stops, the lower the level of service utilization. Similarly, less frequent service is perceived as less reliable and, in turn, utilization decreases.
- *Time-of-day variations* – TBEST accommodates peak-period travel patterns by rewarding peak service periods with greater service utilization forecasts.
- *Route competition and route complementarities* – TBEST accounts for competition between routes. Routes connecting to the same destinations or anchor points, or that travel on common corridors, experience decreases in service utilization. Conversely, routes that are synchronized and support each other in terms of service to major destinations or transfer locations and schedule benefit from that complementary relationship.

The following section outlines the model input and assumptions used, includes a description of the TBEST scenario run performed using the model, and summarizes the ridership forecasts produced by TBEST.

**Table 7-2  
Passengers per Hour Analysis**

Route	Period	Headway		Vehicles		2012 Actual PPH	Passengers per Hour Projections										
		Original	Proposed	Original	Proposed		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
18	Sat Eve	30	20	9	14	68.4	69.4	70.5	71.5	72.6	73.7	74.8	75.9	77.1	78.2	79.4	80.6
72	PM Peak	15	12	11	15	63.5	64.5	65.4	66.4	67.4	68.4	69.4	70.5	71.5	72.6	73.7	74.8
18	PM Peak	15	12	17	23	59.3	60.2	61.1	62.0	62.9	63.9	64.8	65.8	66.8	67.8	68.8	69.9
18	AM Peak	15	12	17	21	58.6	59.5	60.4	61.3	62.2	63.1	64.1	65.0	66.0	67.0	68.0	69.0
18	Sat Base	20	15	13	19	56.2	57.0	57.9	58.8	59.6	60.5	61.5	62.4	63.3	64.3	65.2	66.2
18	Wkd Base	15	12	17	22	56.1	56.9	57.8	58.7	59.5	60.4	61.3	62.3	63.2	64.1	65.1	66.1
1	Sat Eve	30	20	5	8	55.3	56.1	57.0	57.8	58.7	59.6	60.5	61.4	62.3	63.2	64.2	65.1
34	PM Peak	20	15	6	9	55.2	56.0	56.9	57.7	58.6	59.5	60.4	61.3	62.2	63.1	64.1	65.0
1	PM Peak	15	12	10	13	54.5	55.3	56.1	57.0	57.8	58.7	59.6	60.5	61.4	62.3	63.2	64.2
10	PM Peak	30	20	6	10	54.3	55.1	55.9	56.8	57.6	58.5	59.4	60.3	61.2	62.1	63.0	64.0
72	Sat Base	20	15	8	11	54.3	55.1	55.9	56.8	57.6	58.5	59.4	60.3	61.2	62.1	63.0	64.0
50	Sat Base	45	30	3	5	54.2	55.0	55.8	56.7	57.5	58.4	59.3	60.2	61.1	62.0	62.9	63.8
72	Sat Eve	30	20	5	8	54.2	55.0	55.8	56.7	57.5	58.4	59.3	60.2	61.1	62.0	62.9	63.8
1	Sat Base	20	15	8	11	53.2	54.0	54.8	55.6	56.5	57.3	58.2	59.0	59.9	60.8	61.7	62.7
1	Wkd Eve	30	20	5	8	53.1	53.9	54.7	55.5	56.4	57.2	58.1	58.9	59.8	60.7	61.6	62.5
18	Sun Base	30	20	8	13	53.1	53.9	54.7	55.5	56.4	57.2	58.1	58.9	59.8	60.7	61.6	62.5
1	Sun Base	20	15	8	11	53.1	53.9	54.7	55.5	56.4	57.2	58.1	58.9	59.8	60.7	61.6	62.5
18	Wkd Eve	30	20	9	14	51.8	52.6	53.4	54.2	55.0	55.8	56.6	57.5	58.4	59.2	60.1	61.0
14	PM Peak	20	15	7	10	51.5	52.3	53.1	53.9	54.7	55.5	56.3	57.2	58.0	58.9	59.8	60.7
34	AM Peak	20	15	6	9	51.5	52.3	53.1	53.9	54.7	55.5	56.3	57.2	58.0	58.9	59.8	60.7
72	AM Peak	15	12	11	14	50.8	51.6	52.3	53.1	53.9	54.7	55.5	56.4	57.2	58.1	59.0	59.8
72	Sun Eve	45	30	3	5	50.6	51.4	52.1	52.9	53.7	54.5	55.3	56.2	57.0	57.9	58.7	59.6
72	Wkd Eve	30	20	5	8	50.3	51.1	51.8	52.6	53.4	54.2	55.0	55.8	56.7	57.5	58.4	59.3
50	Wkd Base	30	20	5	8	50.1	50.9	51.6	52.4	53.2	54.0	54.8	55.6	56.4	57.3	58.1	59.0
36	PM Peak	20	15	9	12	50.0	50.8	51.5	52.3	53.1	53.9	54.7	55.5	56.3	57.2	58.0	58.9
36	Sat Base	30	20	7	11	49.9	50.6	51.4	52.2	53.0	53.8	54.6	55.4	56.2	57.1	57.9	58.8
14	Wkd Base	30	20	4	7	49.4	50.1	50.9	51.7	52.4	53.2	54.0	54.8	55.6	56.5	57.3	58.2
1	Wkd Base	15	12	10	13	49.4	50.1	50.9	51.7	52.4	53.2	54.0	54.8	55.6	56.5	57.3	58.2
18	Sat Nite	45	30	5	8	49.3	50.0	50.8	51.6	52.3	53.1	53.9	54.7	55.5	56.4	57.2	58.1
50	PM Peak	20	15	8	11	49.0	49.7	50.5	51.2	52.0	52.8	53.6	54.4	55.2	56.0	56.9	57.7
72	Wkd Base	15	12	8	12	49.0	49.7	50.5	51.2	52.0	52.8	53.6	54.4	55.2	56.0	56.9	57.7
42	PM Peak	30	20	4	7	49.0	49.7	50.5	51.2	52.0	52.8	53.6	54.4	55.2	56.0	56.9	57.7
72	Sun Base	30	20	5	8	48.5	49.2	50.0	50.7	51.5	52.2	53.0	53.8	54.6	55.5	56.3	57.1
18	Sun Eve	30	20	8	12	48.2	48.9	49.7	50.4	51.2	51.9	52.7	53.5	54.3	55.1	55.9	56.8
34	Wkd Base	30	20	4	7	48.0	48.7	49.5	50.2	50.9	51.7	52.5	53.3	54.1	54.9	55.7	56.5
7	PM Peak	20	15	8	11	47.9	48.6	49.3	50.1	50.8	51.6	52.4	53.2	54.0	54.8	55.6	56.4
60	Wkd Base	30	20	5	8	47.8	48.5	49.2	50.0	50.7	51.5	52.3	53.1	53.8	54.7	55.5	56.3
50	AM Peak	20	15	8	11	47.6	48.3	49.0	49.8	50.5	51.3	52.0	52.8	53.6	54.4	55.2	56.1
60	PM Peak	20	15	8	11	47.5	48.2	48.9	49.7	50.4	51.2	51.9	52.7	53.5	54.3	55.1	56.0
2	Wkd Base	30	20	8	13	47.2	47.9	48.6	49.4	50.1	50.8	51.6	52.4	53.2	54.0	54.8	55.6
28	PM Peak	20	15	9	13	46.9	47.6	48.3	49.0	49.8	50.5	51.3	52.1	52.8	53.6	54.4	55.2
72	Sat Nite	45	30	3	5	46.9	47.6	48.3	49.0	49.8	50.5	51.3	52.1	52.8	53.6	54.4	55.2
30	PM Peak	20	15	5	7	46.8	47.5	48.2	48.9	49.7	50.4	51.2	51.9	52.7	53.5	54.3	55.1
441	PM Peak	30	20	7	11	46.7	47.4	48.1	48.8	49.6	50.3	51.1	51.8	52.6	53.4	54.2	55.0
55	PM Peak	30	20	5	8	46.2	46.9	47.6	48.3	49.0	49.8	50.5	51.3	52.0	52.8	53.6	54.4
40	Wkd Base	30	20	5	8	46.1	46.8	47.5	48.2	48.9	49.7	50.4	51.2	51.9	52.7	53.5	54.3
2	PM Peak	20	15	12	17	45.9	46.6	47.3	48.0	48.7	49.4	50.2	50.9	51.7	52.5	53.3	54.1
441	AM Peak	30	20	6	10	45.4	46.1	46.8	47.5	48.2	48.9	49.6	50.4	51.1	51.9	52.7	53.5
40	PM Peak	20	15	8	11	44.9	45.6	46.3	47.0	47.7	48.4	49.1	49.8	50.6	51.3	52.1	52.9
60	AM Peak	20	15	8	11	44.9	45.6	46.3	47.0	47.7	48.4	49.1	49.8	50.6	51.3	52.1	52.9
42	Sat Base	60	40	2	3	44.8	45.5	46.2	46.8	47.5	48.3	49.0	49.7	50.5	51.2	52.0	52.8
18	Wkd Nite	30	20	8	13	44.7	45.4	46.1	46.7	47.4	48.2	48.9	49.6	50.4	51.1	51.9	52.7
81	PM Peak	20	15	9	13	44.2	44.9	45.5	46.2	46.9	47.6	48.3	49.1	49.8	50.5	51.3	52.1
1	AM Peak	15	12	10	13	44.1	44.8	45.4	46.1	46.8	47.5	48.2	48.9	49.7	50.4	51.2	51.9
55	AM Peak	30	20	5	8	44.1	44.8	45.4	46.1	46.8	47.5	48.2	48.9	49.7	50.4	51.2	51.9
14	Sat Base	45	30	3	5	44.0	44.7	45.3	46.0	46.7	47.4	48.1	48.8	49.6	50.3	51.1	51.8
1	Sun Eve	30	20	5	8	43.9	44.6	45.2	45.9	46.6	47.3	48.0	48.7	49.5	50.2	50.9	51.7
10	Wkd Base	30	20	6	10	43.4	44.1	44.7	45.4	46.1	46.8	47.5	48.2	48.9	49.6	50.4	51.1
28	AM Peak	20	15	9	13	43.0	43.6	44.3	45.0	45.6	46.3	47.0	47.7	48.4	49.2	49.9	50.7
31	Wkd Base	30	20	5	8	43.0	43.6	44.3	45.0	45.6	46.3	47.0	47.7	48.4	49.2	49.9	50.7
50	Sat Eve	45	30	3	5	42.6	43.2	43.9	44.5	45.2	45.9	46.6	47.3	48.0	48.7	49.4	50.2
<b>BCT</b>	<b>Average</b>					<b>38.3</b>	<b>38.9</b>	<b>39.5</b>	<b>40.0</b>	<b>40.7</b>	<b>41.3</b>	<b>41.9</b>	<b>42.5</b>	<b>43.1</b>	<b>43.8</b>	<b>44.4</b>	<b>45.1</b>

TBEST uses various demographic and transit network data as model inputs. The inputs and the assumptions made in modeling the BCT system in TBEST are presented below. The BCT model utilized the recently released TBEST Land Use Model structure. The TBEST Land Use model is supported by parcel-level data developed from the Florida Department of Revenue (DOR) statewide tax database. The DOR parcel data contain land use designations and supporting attributes which allow the application of ITE-based trip generation rates at the parcel level as an indicator of travel activity.

It should be noted, however, that the model is not interactive with roadway network conditions. Therefore, ridership forecasts will not show direct sensitivity to changes in the roadway traffic conditions or speeds.

- *Transit Network* – The BCT transit route network was created to reflect 2013 base conditions. The BCT fixed and express bus routes were developed using the TBEST GTFS Network Import tool. The imported routes contain all necessary model input parameters including route alignments for each unique trip path per route and direction, stop locations, stop name and description, service span, headway, and in-vehicle travel time. The imported GTFS routes were in service from January 6, 2013 to May 11, 2013. Community Bus alignments were provided by BCT in shapefile format and routes were input using TBEST network coding tools. Community Bus service characteristics were derived from published schedules and input as part of the network coding process. The Tri-Rail network alignment was also included as part of the BCT network to allow for bus service network accessibility to be calculated for those routes which service Tri-Rail stations. Tri-Rail ridership forecasts are not included as part of this document. Terminal and transfer station locations were provided by BCT and coded into the TBEST network. BCT also provided observed average daily ridership numbers as input into the TBEST model validation.
- *Demographic Data* – The demographics used as the base input for the TBEST model are derived from Census 2010 geography and population characteristics, American Community Survey 5-year Estimates (2006-2010), 2011 InfoUSA employment data and 2011 parcel-level land use data from Florida Department of Revenue. Using the data inputs above, the model captures market demand (population, demographics, employment and land use characteristics) within ¼ mile of each stop.
- *Population and Employment Growth Rates* – TBEST uses a socio-economic data growth function to project population and employment data. A population growth rate and an employment growth rate were calculated using the 2040 TAZ forecasts developed for the Broward County LRTP. As indicated previously, population and employment data are hard-coded into the model

and cannot be modified by end-users. As applied, the growth rates do not reflect fluctuating economic conditions as experienced in real time.

- *TBEST Model Limitations* – According to Rule 14-73.001 Florida Administrative Code, TBEST is the FDOT-approved model for transit ridership forecasting as part of TDPs in Florida. It has long been a desire of FDOT to have a standard modeling tool for transit demand that could be standardized across the state similar to the Florida Standard Urban Transportation Model Structure (FSUTMS) model used by MPOs in developing LRTPs. However, while TBEST is an important tool for evaluating improvements to existing and future transit services, model outputs do not account for latent demand for transit that could yield significantly higher ridership, and, correspondingly, model outputs may over-estimate demand in isolated cases. In addition, TBEST cannot display sensitivities to external factors such as an improved marketing and advertising program, changes in pricing service for customers, and other local conditions.

Although TBEST provides ridership projections at the route and bus stop levels, its strength lies more in its ability to facilitate relative comparisons of ridership productivity. As a result, model outputs are not absolute ridership projections, but rather are comparative for evaluation in actual service implementation decisions. TBEST has generated interest with DOTs in other states and continues to be a work in progress that will become more useful as its capabilities are enhanced in future updates to the model. Consequently, it is important for the transit agency to integrate sound planning judgment and experience when interpreting TBEST results.

Using these inputs, assumptions, and actual ridership data, the TBEST model was validated. Using the validation model as the base model, TBEST ridership forecasts for the TDP planning horizon year, FY 2023, were developed. The generated annual ridership forecasts reflect the estimated level of service utilization if no changes were to be made to any of the fixed-route services.

Table 7-3 shows the projected number of annual weekday riders by mode for three scenarios. The base year represents current ridership levels. Future Year – Status Quo provides the results of running the model for 2023 with the current transit system and no improvements. Ridership increases in this category are driven by population growth, employment growth, and land use changes for the future year. The Future Year – Improved column provides results for the new system plus all of the service improvements described at the beginning of this section.

The results of the analysis show that by replacing the Breeze network with the more premium Enhanced Bus network that ridership increases dramatically. Community Bus has the smallest increase at 18 percent over the 10-year period. Systemwide the improvements lead to a 67 percent increase in ridership.

Ridership modeling results by mode and route by weekday, Saturday, or Sunday service can be found in Appendix M.

**Table 7-3**  
**TBEST Average Weekday Ridership Projections**

Mode	Base Year	Future Year Status Quo	Future Year Improved	Percent Change (Base Year to Future Year Improved)
Fixed Routes	119,276	128,126	162,141	36%
The Wave	0	0	3,597	N/A
Express	1,941	2,237	2,482	28%
Breeze/Enhanced	4,323	4,812	45,926	962%
Community Bus	8,472	9,098	9,980	18%
Systemwide	134,012	144,273	224,126	67%

Note: Enhanced Bus Routes replace Breeze Routes by FY 2023.

Source: TBEST

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