

CENTRAL BROWARD EAST-WEST TRANSIT STUDY MODELING METHODOLOGY TECHNICAL MEMORANDUM



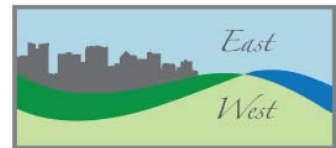
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JACOBS

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CENTRAL BROWARD



TRANSIT STUDY

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1.0 Introduction

The purpose of this memo is to present the methodology used for modeling alternatives for the Central Broward East-West Transit Study. This document discusses the project and the major alternatives that were proposed to address the transportation issues in the study area.

The Florida Department of Transportation (FDOT) District Four, in partnership with the Broward Metropolitan Planning Organization (MPO), Broward County Transit (BCT), and the South Florida Regional Transportation Authority (SFRTA), is conducting the Central Broward East-West Transit Study (Exhibit 1). The scope of this Study is to evaluate the introduction of premium transit (bus rapid transit (BRT) or modern streetcar) service that improves east-west mobility in the study area. The study area, in central Broward County, extends from Oakland Park Boulevard to the north, the Sawgrass Expressway/I-75 in the west, Stirling Road and Griffin Road to the south, and the Intracoastal Waterway/Port Everglades in the east. The study area is approximately 14 miles long and 8 miles wide and is illustrated in Exhibit 1.

Exhibit 1: Project Location Map



The study area includes a commercial area in the west (Sawgrass Mills Mall and BB&T Center, formerly the Bank Atlantic Center), a major education hub (South Florida Education Center (SFEC)) in the middle, and the Fort Lauderdale-Hollywood International Airport, and downtown Fort Lauderdale in the east. The study area contains approximately 633,000 people and 311,000 jobs¹. The study area has approximately 131,000 public and private school students, and 57,000 college/university students (out of which, approximately 43,000 are located in the SFEC)².

The most heavily used existing east-west transit option in the study area is BCT's route #72, running along Oakland Park Boulevard between Sawgrass Mills Mall and A1A at a frequency of 15 minutes. There are two Tri-Rail stations within

the study area: the Broward Boulevard Tri-Rail Station and the Griffin Road (Fort Lauderdale-Hollywood International Airport at Dania Beach) Tri-Rail Station. These stations connect the study area to regional attractions.

¹ From SERPM 6.7 ZDATA

² From SERPM 6.7 ZDATA

2.0 Alternatives

This section describes the primary alternatives used in this phase of the Study.

2.1 No Build Alternative

The No Build Alternative uses the adopted cost feasible 2035 Long Range Transportation Plan (LRTP) to represent the highway and the background transit system both inside and outside the study area. The 2035 highway network includes three reversible managed lanes along I-595 in addition to the access improvements along the general purpose lanes. The existing 95 Express Lanes are assumed to extend to Yamato Road in West Palm Beach. A toll is applied to single-occupant vehicles and non-preregistered carpools in these lanes, with the toll amount set by the operating speed of the managed lanes. There are significant transit improvements proposed for Broward County in the 2035 LRTP network in comparison to the 2010 transit network, including more than a 190 percent increase in daily transit-vehicle-miles and a 150 percent increase in daily transit-vehicle-hours. Numerous new BRT and rapid bus routes, providing high speed and high frequency service, are planned on all major roadways in Broward County. For this study, BRT is assumed to have a higher frequency service along with limited stops operating in an exclusive transit-only right-of-way. Rapid bus service is also assumed to have higher service levels and limited stops; however, it will operate in general purpose lanes and potentially be impacted by auto traffic congestion. Two of the proposed rapid buses operate in the study area: the Oakland Park Boulevard and Sunrise Boulevard rapid buses. The planned rapid buses along University Drive and SR 7 will offer major transfer opportunities to study area riders. Additional local bus service is also proposed along Griffin Road, Flamingo Road, Nob Hill Road and Pine Island Road. These facilities do not have any fixed-route transit service. The I-595 Express bus service began in May 2012 and connects the western parts of Broward County to downtown Fort Lauderdale and downtown Miami. The detailed list of the study area transit routes and their headway service levels are provided in Exhibit 2.

2.2 TSM Alternative

The TSM Alternative builds upon the No Build Alternative service by adding a premium bus service with 10 minute peak and 15 minute off-peak service. The premium bus runs along the Griffin Road general purpose lanes between University Drive/Nova Drive and Broward General Hospital (SE 17th Street and Andrews Avenue). The premium bus service runs in mixed-flow traffic. The local bus service along Griffin Road terminates at the Griffin Road/University Drive station of the premium bus service. A 60 minutes off-peak service is added for the I-595 express buses.

The boarding and transfer fares for these limited-stop buses are same as the BCT local bus (\$1.32 boarding fare), which follow BCT's existing policy for its limited-stop Breeze service. The \$1.32 fare was derived to reflect the BCT monthly pass at an average daily fare value. The use of the monthly pass fare also includes the benefits of that pass in terms of the cost to transfer and the ability to ride external systems at a reduced fare.

Exhibit 2: Summary of Study Area Transit Service Levels 2010-2035

Direction	Route	Route Name	Headway (Peak/Off-peak)	
			2010	2035
East-West Routes	72	Oakland Park Blvd Local Bus	15/20	10/15
	Rapid Bus	Oakland Park Blvd/Andrews Rapid Bus	-/-	10/15
	Rapid Bus	Oakland Park Blvd Rapid Bus EW	-/-	10/15
	36	Sunrise Blvd Local Bus	15/20	10/15
	Rapid Bus	Sunrise Blvd Rapid Bus	-/-	5/7.5
	22	Broward Blvd Local Bus	30/40	20/20
	Rapid Bus	Broward Blvd Rapid Bus - SR 7 to BCT	-/-	5/7.5
	Rapid Bus	Broward Blvd Rapid Bus - Central Terminal to BCT	-/-	20/20
	New Local	Griffin Rd Local	-/-	20/30
	30	Peters Rd Local Bus	30/30	10/15
	12	West Regional Terminal to North Beach Park	45/45	15/20
	Express Bus	I-595 Pilot Express - Weston P&R to Broward Med. Center	-/-	30/0
	Express Bus	I-595 Pilot Express - Bank Atlantic P&R to Broward Med. Center	-/-	30/0
	Express Bus	I-595 Pilot Express - Weston P&R to Miami Downtown	-/-	30/0
Express Bus	I-595 Pilot Express - Bank Atlantic P&R to Miami Downtown	-/-	30/0	
North-South Routes	New Local	Flamingo Rd Local Bus	-/-	20/30
	New Local	Nob Hill Rd Local Bus	-/-	15/20
	New Local	Pine Island Local Bus	-/-	15/20
	2	University Blvd Local Bus	20/30	10/15
	Breeze/Rapid Bus	University Blvd Rapid Bus	30/0	5/7.5
	9	Davie to Downtown Local Bus	45/45	15/20
	18	SR 7 Local Bus	15/15	10/15
	Breeze/Rapid Bus	SR 7 Rapid Bus	30/0	5/7.5
	1	US 1 Local Bus	15/15	10/15
Breeze/Rapid Bus	US 1 Rapid Bus	30/0	10/15	
Regional Routes	TRL	Tri-Rail	25/60	20/60

*Headway times are in minutes.

Source: Broward MPO 2035 Long Range Transportation Plan (LRTP)

2.3 Build Alternatives

The Build Alternatives use the No Build background transit network. The local bus service along Griffin Road terminates at the Griffin Road/University Drive station. A 60 minutes off-peak service is added for the I-595 express buses. There are three main types of Build Alternatives proposed for the Study, each with slightly different service patterns in three distinct areas of the study area: western, central and eastern.

The western section of the alignment is between Sawgrass Mills and the SFEC. All Build Alternatives propose a premium bus (rapid bus) connecting the Sawgrass Mills area to the SFEC utilizing the arterial roadways and the I-595 general purpose lanes. There are two new park and ride locations along the proposed alignment: one at the BB&T Center and the other at University Drive/Nova Drive. The park and ride access is free at all the locations.

The central section of the alignment connects the western area to the eastern area. One alignment connects the SFEC via Broward Boulevard and SR 7 to the Broward Boulevard Tri-Rail Station, referred to as the SR 7/Broward Boulevard Premium Bus Alternative. The other alignment serves the same area by connecting from the SFEC via Griffin Road to the Griffin Road Tri-Rail Station, referred to as the Griffin Road Alternatives. This section has either streetcar or premium bus service, depending upon the alternative selected.

The third area, the eastern section of the alignment, is located between the Broward Boulevard Tri-Rail Station and Griffin Road Tri-Rail Station. All alternatives in this area propose modern streetcar service. The details of the three main types of alternatives are discussed below.

For the SR 7/Broward Boulevard Premium Bus Alternative, a premium bus operates in general purpose lanes between Sawgrass Mills and the CBT Terminal via the SFEC campus area. There are 14 stops in each direction. A modern streetcar runs between Broward Boulevard Tri-Rail Station and Griffin Road Tri-Rail Station, and includes 12 stations.

In the Griffin Road Alternatives, a premium bus operates in general purpose lanes between Sawgrass Mills and the SFEC area. The premium bus has a total of four stops, including three in the Sawgrass Mills area and one at the intersection of University Drive and Nova Drive. From the intersection of University Drive and Nova Drive, one alternative includes modern streetcar service along Nova Drive to Davie Road, and then continues east on Griffin Road to the Griffin Road Tri-Rail Station. The other Griffin Road alternative follows a similar alignment but operates premium bus instead of modern streetcar to the Griffin Road Tri-Rail Station. Both alternatives have 22 stations in the eastbound and westbound directions.

The alignments of the Build Alternatives are shown in Exhibits 3 and 4.

Exhibit 3: SR 7/Broward Boulevard Premium Bus Alternative



Exhibit 4: Griffin Road Alternatives



The travel times are calculated differently for mixed-flow and exclusive right-of-way vehicles. Travel times for mixed-flow vehicles are computed by adding an average delay time per modeled stop (if a stop exists along the link) to the auto time for each link, and then summing across all links in the route. Travel times for exclusive right-of-way vehicles are calculated from equations of motion based on the operating characteristics of the proposed vehicle. This is consistent with the methodology used in SERPM 6.7. Exhibits 5 and 6 show the expected and estimated travel times for the proposed premium transit services in the alternatives. The expected travel time is calculated considering acceleration/deceleration estimates and other operational constraints along the proposed alignment.

Exhibit 5: Expected and Estimated Travel Times (in Minutes) for the SR 7/Broward Boulevard Premium Bus Alternative

Route	Direction	Expected	Estimated
Sawgrass Mills - BCT (Bus)	EB	44	56
	WB	44	49
Project Guideway (Rail)	EB	24	24
	WB	21	24

Source: Estimated travel times from SERPM 6.7

Exhibit 6: Headways, Expected, and Estimated Travel Times (in Minutes) for the Griffin Road Alternatives

Route	Direction	Headway (in minutes) (peak/off-peak)	Expected	Estimated
Sawgrass Mills - SFEC (Bus)	EB	20/30	18	19
	WB		18	15
Project Guideway (Rail)	EB	10/15	40	38
	WB		39	41

Source: Estimated travel times from SERPM 6.7

The BCT local bus transfer and boarding fares are used for both premium bus and modern streetcar.

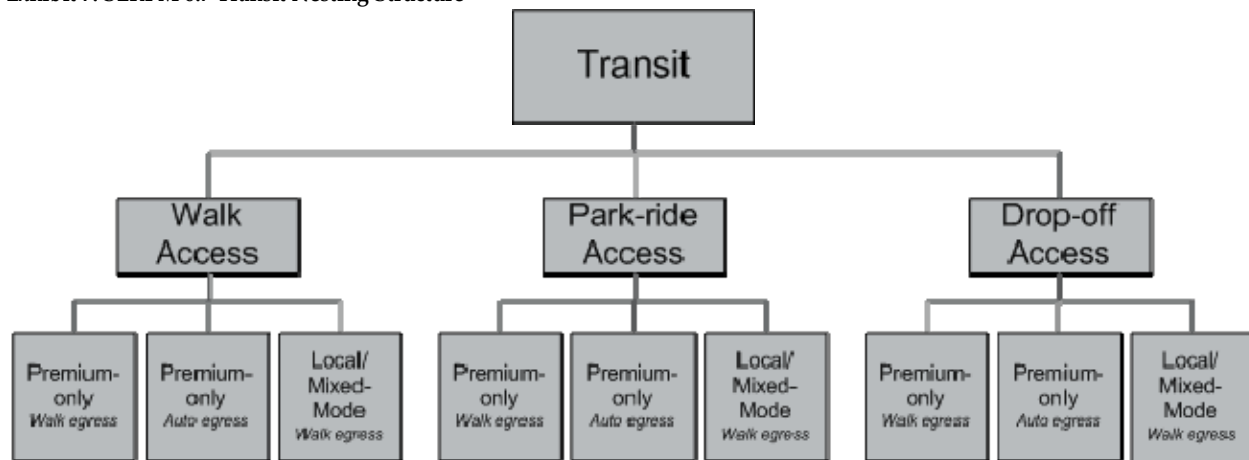
3.0 Travel Demand Model Overview

SERPM 6.7, the travel demand model used for this study, represents a regional model covering Miami-Dade, Broward, and Palm Beach Counties. SERPM 6.7 was developed through extensive calibration and validation using the transit on-board surveys conducted between 2008 and 2010. All of these were Origin/Destination (O/D) surveys with riders being asked about details on their transit trip such as origin/destination, mode of access, transit route sequence, socio-demographic information, trip purpose and other details. The five transit services surveyed are Tri-Rail (in 2008), Metrorail (2009), I-95 Express Bus (2010), Palm Tran (2010) and Broward County Transit (2010). Metrobus was previously surveyed in 2004 and was also used in this effort. The details of its characteristics and development are discussed in depth in the “*Calibration Technical Memo*” of the SERPM 6.7 Transit Model, which has been included electronically with this document.

3.1 Pathbuilding/Mode Choice Structure

The transit pathbuilding structure consists of the three access modes (walk, park-ride, and drop-off) and three line-haul/egress paths: premium-only (walk-egress), premium-only (auto-egress), and local/mixed-mode (walk-egress). This structure has a total of nine (3x3) paths. By extension, these paths comprise the lowest level of the mode choice nesting structure. The transit nest of the mode choice structure is shown in Exhibit 7.

Exhibit 7: SERPM 6.7 Transit Nesting Structure



“Premium” transit services are defined as those not subject to auto signals and/or general traffic delays. Existing premium transit services in southeast Florida include Tri-Rail, Metrorail, BCT’s 95 Express bus service (which operates on the I-95 managed lanes), and Miami-Dade Transit’s (MDT) 95X express bus (which also operates on the I-95 managed lanes). All other services are considered “local”; these include bus services provided by Palm Tran, BCT, and MDT.

The limited-stop services proposed in the TSM Alternative of the 2035 LRTP are coded with the new premium bus service (Rapid Bus service mode). This is the same mode definition (mode 34) used for all other premium service (BRT and Rapid buses) in the 2035 LRTP. The premium bus services are assumed to have signal priority and/or pre-emption and other amenities to allow them to avoid general signal and traffic delays. The proposed modern streetcar services for the Build Alternatives are

coded with a distinct mode number (mode 35) so that the model procedures can apply benefits derived from un-included attributes applicable to this service.

For the introduction of a new transit mode to an area, FTA allows a grant applicant to claim credit for the user benefits caused by attributes of that mode beyond the travel time and cost measures currently available in the local travel model. The additional benefits are applicable to this study in the following forms:

- (1) A positive constant (bonus) for trips using the project via park/ride access and no dependence on local buses.
- (2) A less onerous weight (IVTT discount) applied to the time spent riding the new facility compared to the weight applied to time spent on all other modes.

Using FTA guidelines for accounting for un-included attributes, the model applies a 10% discount to in-vehicle travel time (IVTT) on this mode and up to 7 minutes of IVTT bonus if this mode appears on the transit path. Both the premium bus and modern streetcar mode definitions allow them to be selected in the premium-only paths, as well as the local/mixed-mode path. The presence of key modes in the pathbuilding structure is shown in Exhibit 8.

Exhibit 8: Presence of Modes in the Transit Path Structure

SERPM 6.7 Mode			Walk Access			Park-Ride Access			Drop-off Access		
Type	Description	Number	Premium-only Walk Egress	Premium-only Auto Egress	Local/Mixed-mode Walk Egress	Premium-only Walk Egress	Premium-only Auto Egress	Local/Mixed-mode Walk Egress	Premium-only Walk Egress	Premium-only Auto Egress	Local/Mixed-mode Walk Egress
Existing	Tri-Rail	15	•	•	•	•	•	•	•	•	•
Existing	Local Bus Service	33			•			•			•
Existing	Express Bus Service	33			•			•			•
New	Downtown WAVE	32	•	•	•	•	•	•	•	•	•
New	Premium Bus (Rapid/BRT Bus Service)	34	•	•	•	•	•	•	•	•	•
New	Modern Streetcar (LRT)	35	•	•	•	•	•	•	•	•	•

• implies the mode appears in the mentioned transit path

The travel component weights used in pathbuilding are shown in Exhibit 9. The only modification from the standard SERPM 6.7 weights is the addition of a 10% IVTT discount for the proposed modern streetcar service. All other proposed transit services, including the new premium bus service, do not receive an IVTT discount.

Exhibit 9: SERPM 6.7 Pathbuilding Components and Their Respective Values

Component	Value
In-vehicle time	1.00x for all bus modes and Metromover 0.90x Proposed CBT Modern Streetcar service 0.85x Metrorail 0.80x Tri-Rail
Initial and transfer wait time	2.0x for the first 7 minutes of wait time 1.0x after the first 7 minutes of wait time
Access time	2.00x for walk-access time For park and ride and kiss and ride access time: <ul style="list-style-type: none"> • 2.00x for very low density areas • 2.00x for low density areas • 2.00x for medium density areas • 3.50x for high density areas • 5.00x for CBD areas
Egress time	2.00x for walk-egress time 4.00x for auto-egress time
Transfer walk time	2.00x
Transfer Penalty	5.0 minutes per transfer for walk access 20.0 minutes per transfer for park-ride access 10.0 minutes per transfer for drop-off access
Transit fare	Appropriate boarding and transfer fare applied at \$8.13 value-of-time

3.2 Mode Choice Model

The SERPM 6.7 mode choice model utilizes auto availability market segmentation (AAMS) rather than one based on auto ownership. The three AAMS categories are:

1. Zero-cars available to the household;
2. Households where the number of workers (for HBW) or people (for non-work trips) exceed the number of autos available to the household; and
3. Households where the number of workers or people are equal to or less than the number of autos available to the household.

Mode choice is executed individually for peak and off-peak HBW, HBO, HBU, and NHB trips. The mode choice procedures produce trip tables by each sub-mode/access mode combination for the three market segments (i.e., AAMS categories 1, 2, and 3) so that trips from a particular market segment can be reviewed or assigned separately, if desired.

A new set of mode choice coefficients is being used for SERPM 6.7. The new set of coefficients is detailed in Exhibit 10. The mode choice coefficients are consistent with the weights used in the transit path builder. The values used to estimate these coefficients are discussed in detail in "Calibration Technical Memo". The auto operating cost has been carried forward from the SERPM 6.5 (LRTP) model.

Exhibit 10: SERPM 6.7 Mode Choice Coefficients

Actual Transit Path Building Weights (relative to IVTT coefficient)

Variable	Peak			Off-Peak		
	HBW	HBO	NHB	HBW	HBO	NHB
Transit run time, highway run time	1.00	1.00	1.00	1.00	1.00	1.00
Transit walk time, highway terminal time	2.00	2.00	2.00	2.00	2.00	2.00
Pre-weighted* transit auto access/egress time	1.00	1.00	1.00	1.00	1.00	1.00
Transit first wait (<=7 minutes)	2.00	2.00	2.00	2.00	2.00	2.00
Transit first wait (>7 minutes)	1.00	1.00	1.00	1.00	1.00	1.00
Transit transfer wait time	2.00	2.00	2.00	2.00	2.00	2.00
Transit number of transfers (Walk access)	5.00	5.00	5.00	5.00	5.00	5.00
Transit number of transfers (Park-ride access)	20.00	20.00	20.00	20.00	20.00	20.00
Transit number of transfers (Kiss-ride access)	10.00	10.00	10.00	10.00	10.00	10.00
Transit fare (Value of time in \$/hr)	\$ 8.13	\$ 6.94	\$ 7.49	\$ 8.13	\$ 6.94	\$ 7.49
Highway auto operating costs (Value of time in \$/hr)	\$ 8.13	\$ 6.94	\$ 7.49	\$ 8.13	\$ 6.94	\$ 7.49
Highway parking costs (Value of time in \$/hr)	\$ 8.13	\$ 6.94	\$ 7.49	\$ 8.13	\$ 6.94	\$ 7.49
HOV time difference	0.72	1.00	1.00	0.90	1.00	1.00

Variables not used in the transit path building process but used in mode choice utility calculations.

Mode Choice Coefficient

Variable Coefficient	Peak			Off-Peak		
	HBW	HBO	NHB	HBW	HBO	NHB
Transit run time, highway run time	-0.0250	-0.0150	-0.0250	-0.0250	-0.0150	-0.0250
Transit walk time, highway terminal time	-0.0500	-0.0300	-0.0500	-0.0500	-0.0300	-0.0500
Pre-weighted* transit auto access/egress time	-0.0250	-0.0150	-0.0250	-0.0250	-0.0150	-0.0250
Transit first wait (<=7 minutes)	-0.0500	-0.0300	-0.0500	-0.0500	-0.0300	-0.0500
Transit first wait (>7 minutes)	-0.0250	-0.0150	-0.0250	-0.0250	-0.0150	-0.0250
Transit transfer wait time	-0.0500	-0.0300	-0.0500	-0.0500	-0.0300	-0.0500
Transit number of transfers (Walk access)	-0.1250	-0.0750	-0.1250	-0.1250	-0.0750	-0.1250
Transit number of transfers (Park-ride access)	-0.5000	-0.3000	-0.5000	-0.5000	-0.3000	-0.5000
Transit number of transfers (Kiss-ride access)	-0.2500	-0.1500	-0.2500	-0.2500	-0.1500	-0.2500
Transit fare	-0.0018	-0.0013	-0.0020	-0.0018	-0.0013	-0.0020
Highway auto operating costs	-0.0018	-0.0013	-0.0020	-0.0018	-0.0013	-0.0020
Highway parking costs	-0.0018	-0.0013	-0.0020	-0.0018	-0.0013	-0.0020
HOV time difference	-0.0180	-0.0150	-0.0250	-0.0180	-0.0150	-0.0250

Initial Nesting Coefficients

Nest	Peak			Off-Peak		
	HBW	HBO	NHB	HBW	HBO	NHB
Auto	0.500	0.500	0.500	0.500	0.500	0.500
Auto - shared ride	0.500	0.500	0.500	0.500	0.500	0.500
Transit	0.500	0.500	0.500	0.500	0.500	0.500
Transit - Access category	0.500	0.500	0.500	0.500	0.500	0.500

*Access time weighted @2X to 5X, depending on the area type of the production zone.

The market segment constants are appropriately updated to reflect the observed transit markets in the South Florida region. The new set of market segment constants and mode choice nest constants used to calibrate the mode choice model are discussed in detail in the “*Calibration Technical Memo*” of SERPM 6.7 Transit Model and are provided in Appendix B. The main focus of the development of SERPM 6.7 was to improve the transit portion of the model; hence, the auto shares were estimated in the same way as was done in the SERPM 6.5 (LRTP) model.

The alternative-specific constants (ASCs), shown in Exhibit 11, are used for accounting the additional comfort and safety (i.e., non-quantitative) benefits provided to the passengers by premium services compared to an equivalent trip on other bus services. The only modification from standard SERPM 6.7 is the addition of an ASC of up to seven minutes for the proposed modern streetcar service. All other proposed bus services in the TSM and Build Alternatives were not assigned an ASC.

Exhibit 11: SERPM 6.7 ASCs for Regional and Study Area Transit Line-Haul Modes

SERPM 6.7 Mode				
Type	Description	Mode Number	In-Vehicle Travel Time Reduction	Constant
Existing	Tri-Rail	15	20%	Tri-Rail IVTT up to 15 minutes
Existing	Metrorail	14	15%	Metrorail IVTT up to 10 minutes
Existing	BCT Local Bus Service	33	0%	0
Existing	BCT Express Bus Service	33	0%	0
New	BCT Downtown WAVE	32	0%	0
New	BCT Premium Bus	34	0%	0
New	BCT Modern Streetcar	35	10%	IVTT up to 7 minutes

3.3 Regional Validation

2010 is the base year for the SERPM 6.7 calibration and validation. SERPM 6.7 is calibrated and validated using the transit survey data at the regional level. The details of the validation analyses are provided in the “*Calibration Technical Memo*” of the SERPM 6.7 Transit Model. The model estimates are very close to the observed travel behavior in Broward County. The details of the validation of SERPM 6.7 at the corridor level are discussed in *Section 3.4, Corridor Validation*.

3.4 Corridor Validation

Key corridor characteristics were reviewed for reasonableness: auto speeds, transit travel times, transit flows and daily transit boardings. Specifically, the auto speeds and transit travel times used to develop the transit impedances for mode choice were reviewed.

The estimated auto speeds are compared to the observed speeds by dividing the major east-west study area roadways into two segments. SR 7 was used as the divider. The model generally overestimates the speeds, except for a few segments on I-595, Broward Boulevard, and Peters Road. For the majority of segments, the estimated speeds are within the reasonable range (within 10 mph) for both the AM peak and off-peak periods as shown in Exhibit 12.

Exhibit 12: Study Area Auto Travel Speed Comparison

Roadway Name (Segment)	Dir	Posted Speed	AM Peak Speeds (mph)				Difference (Est. - Obs.)		Off Peak Speeds (mph)				Difference (Est. - Obs.)	
			Observed		Estimated		EB	WB	Observed		Estimated		EB	WB
			EB	WB	EB	WB			EB	WB	EB	WB		
Broward Blvd (Flamingo Rd - SR-7)	EW	45	24	33	31	39	7	5	31	41	38	38	7	-2
Broward Blvd (SR-7 - Federal Hwy)	EW	38	18	20	22	30	4	10	24	26	29	29	5	3
Griffin Rd (Flamingo Rd - SR-7)	EW	45	23	25	32	38	9	13	28	31	38	38	11	7
Griffin Rd (SR-7 - Federal Hwy)	EW	44	26	30	32	37	6	7	28	37	37	37	9	0
I-595 (Sawgrass Exp - SR-7)	EW	64	35	63	44	66	8	3	64	62	60	61	-4	-1
I-595 (SR-7 - Federal Hwy)	EW	63	57	64	41	62	-16	-2	62	60	57	61	-5	0
Sunrise Blvd (Sawgrass Exp - SR-7)	EW	45	28	26	32	37	4	11	37	33	37	37	1	4
Sunrise Blvd (SR-7 - NE 13th St)	EW	41	22	24	25	32	2	8	21	23	31	31	10	8
Peters Rd (Flamingo Rd - SR-7)	EW	39	22	25	34	36	12	11	24	31	37	37	12	6
Peters Rd (SR-7 - Federal Hwy)	EW	39	23	30	21	33	-2	3	24	25	30	30	6	5
SR 84 West (N Flamingo Rd - SW 64th Ave)	EW	41	23	28	37	40	15	12	26	26	46	40	19	13
SR 84 East (I-595 - Federal Hwy)	EW	41	23	33	23	36	1	3	30	34	32	35	2	1

Sources: Observed data collected using GPS device in floating car runs made in September 2011; estimated data from SERPM 6.7

The major east-west competing transit routes for the Central Broward East-West Transit Study are Oakland Park Boulevard, Sunrise Boulevard, and Broward Boulevard. The estimated end-to-end travel times for these routes are generally within seven minutes of the observed travel times, as shown in Exhibit 13. Travel times for the dominate peak direction, eastbound, are well within reasonable limits.

Exhibit 13: Study Area Transit Travel Time Comparison

Route Name	AM Peak Travel Times (minutes)					Off-Peak Travel Times (minutes)				
	Observed Run Time	Estimated Run Time	Difference (Est. - Obs.)	Distance (mile)	Difference per mile (sec/mile)	Observed Run Time	Estimated Run Time	Difference (Est. - Obs.)	Distance (mile)	Difference per mile (sec/mile)
Rte 72:Oakland Park Blvd EB	70	70	0	16.2	2	65	63	-2	16.2	-6
Rte 72:Oakland Park Blvd WB	75	64	-11	16.2	-39	70	63	-7	16.2	-25
Rte 36: Sunrise Blvd EB	98	94	-4	20.9	-11	93	87	-6	20.9	-17
Rte 36: Sunrise Blvd WB	97	90	-7	20.8	-21	92	87	-5	20.8	-15
Rte 22: Broward Blvd EB	70	65	-5	14.8	-21	65	52	-13	14.8	-54
Rte 22: Broward Blvd WB	70	58	-12	14.8	-49	60	52	-8	14.8	-34
Rte 30: Peters Rd WB	44	39	-5	10.1	-28	40	39	-1	10.1	-8
Rte 30: Peters Rd EB	44	44	0	10.1	0	40	39	-1	10.1	-8
Rtw 9: Young Circle/BCT NB	85	88	3	20.4	9	75	80	5	20.4	16
Rtw 9: Young Circle/BCT SB	80	87	7	20.3	20	75	81	6	20.3	17
Rte 40: Beach/Lauderhill Mall EB	66	74	8	13.7	34	60	68	8	13.7	34
Rte 40: Beach/Lauderhill Mall WB	65	72	7	13.8	30	65	69	4	13.8	19
Rte 56: Plantation EB	90	85	-5	18.4	-17	90	78	-12	18.4	-40
Rte 56: Plantation WB	85	82	-3	18.4	-11	85	78	-7	18.4	-24
Rte 12: Sheridan/SFEC EB	80	78	-2	20.2	-5	75	72	-3	20.2	-8
Rte 12: Sheridan/SFEC WB	85	77	-8	20.2	-24	75	73	-2	20.2	-6

Sources: Observed data from BCT time tables; estimated data from SERPM 6.7.

The model provides a good representation of the dispersed travel patterns of BCT trips in Broward County, as shown in Appendix C. With respect to route-level boardings in the study area, the model underestimates ridership along the east-west routes in the study area, as shown in Exhibit 14. This is consistent with other east-west routes in the county. The model provides a reasonable estimate for the major study area bus route number 22 (Broward Boulevard), with 3,500 estimated riders, compared to the 4,200 observed.

Exhibit 14: Daily Transit Ridership for Study Area Routes

Direction	Route No.	Route Description	Observed	Estimated	Difference (Est. - Obs.)
East-West Routes	22	Broward Blvd Local	4,216	3,527	-689
	72	Oakland Park Blvd Local	7,593	6,017	-1,576
	36	Sunrise Blvd Local	7,176	4,910	-2,266
	30	Peters Rd Local	2,234	2,096	-138
	12	W. Regional Term. to N. Beach Park	1,787	2,138	352
North-South Routes	9	Young Circle to Downtown Local	2,046	2,019	-27
	2	University Dr Local	6,338	7,333	996
	102	University Dr Breeze	903	2,325	1,422
	18	SR 7 Local	14,639	12,215	-2,424
	441	SR 7 Breeze	1,918	729	-1,189
	1	US 1 Local	7,228	7,344	116
Regional Routes	101	US 1 Breeze	919	1,151	232
	TRL	Tri-Rail	12,200	13,001	801
Broward County Transit (BCT) Total Regional Boardings			119,624	123,245	3,621

Sources: Observed data from 2010 BCT transit on-board survey; estimated data from SERPM 6.7.

4.0 Travel Demand Forecasts Overview

Ridership forecasts were prepared for the No Build, TSM, and Build Alternatives, as shown in Exhibit 15. The premium bus services in the TSM Alternative generate 4,400 study area boardings and 90 linked transit trips as compared to the No Build Alternative. The SR 7/Broward Boulevard Premium Bus Alternative is estimated to produce 8,700 daily project boardings, and nearly 2,500 linked transit trips as compared to the No Build Alternative. The Griffin Road Modern Streetcar Alternative produces the highest number of project boardings at 11,300 and 3,500 new transit riders. The Griffin Road Premium Bus Alternative produces 7,900 boardings and 2,500 new transit riders. For the build alternatives, the number of transit dependent boardings (estimated boardings arising from the zero-car household trips) is approximately 20 percent of the total project boardings. The TSM alternative has close to 30 percent of transit dependent boardings.

Exhibit 15: Daily Project Boardings Summary for the Alternatives

Alternatives	Daily Project Boardings (Year 2035)			New Transit Riders (cf. No Build)
	Sawgrass Premium Bus	CBT Guideway Project	Project Total	
TSM Alternative	*4,400	-	4,400	90
SR 7/Broward Boulevard Premium Bus	5,100	3,600	8,700	2,500
Griffin Road Modern Streetcar	900	10,400	11,300	3,500
Griffin Road Premium Bus	3,200	4,700	7,900	2,500

* Boardings on the Griffin Road premium bus services.

**For the purpose of sharing these numbers with the public, the projected boardings were rounded to the nearest hundreds. For this reason, the numbers shown in this table do not exactly match the numbers that appear in the appendices.

Trip patterns in the Build Alternatives are very dispersed, with no dominant destination along the alignments. Generally, across the Build Alternatives approximately 20% of ridership occurs west of the SFEC, approximately 40% occurs between the SFEC and I-95, and approximately 40% occurs east of I-95. Trip movements in the western section of the study area connect the residential areas around the Sawgrass Mills area to the SFEC educational institutions. Trip movements between the SFEC and I-95 generally show circulation movements in and around the SFEC, with some connections to the Tri-Rail stations. Trips east of I-95 generally consist of riders circulating to the major attractions, including the Fort Lauderdale-Hollywood International Airport, Broward General Hospital, and downtown Fort Lauderdale. Detailed tables of activity and boardings by transit routes are provided in Appendices D and E respectively.

There are some differences in ridership characteristics and patterns between Premium Bus and Modern Streetcar riders. Streetcar ridership occurs more in the peak periods (approximately 65% peak) than Bus ridership (approximately 50%). Additionally, streetcar ridership is much more reliant on work and university-trips (65%) than Bus ridership (approximately 50%).

For transit dependant boardings, riders generally access both modes by walking (approximately 65%) with the remaining share equally distributed between park-ride and drop-off access.

It should be noted that the Griffin Road Premium Bus Alternative produces significantly less boardings in comparison to the Griffin Road Modern Streetcar Alternative while both have the same alignment.

This is due in part to the forced transfer at the Griffin Road Tri-Rail Station for riders going from SFEC (central part) to downtown Fort Lauderdale (eastern part) or vice versa. The intra-segment, both central and eastern, trips remain the same for both alternatives. This transfer results in additional travel time of between 5 to 15 minutes for the one directional trip. The increased travel time makes the transit option very unattractive in comparison to the auto mode.

The SR 7/Broward Boulevard Premium Bus Alternative produces lower boardings compared to the Griffin Road Alternatives. This is primarily because there is already an extensive premium bus service provided along Broward Boulevard in the 2035 LRTP transit network which competes directly with the alternative.

4.1 Preliminary Uncertainty Analysis

Additional forecasts were developed to begin to address the uncertainties in forecasting. An alternative very similar to the Griffin Road Modern Streetcar Alternatives was used. The only differences were that in the SFEC area, the modern streetcar made a one-way loop using Nova Drive, Davie Road, Griffin Road and University Drive, and an additional station was included at Perimeter Road just north of the airport. Three runs were made to assess the impacts of socio-economic growth and proposed increases in highway and transit services. Two runs (Run 1 and 3) were prepared for existing year (2010) build and interim year (2016) build alternatives. The land use/person trips data for the interim year was interpolated using the base year (2010) and horizon year (2035) data; which shows approximately 6-7 percent growth relative to 2010. Another run (Run 2) was prepared to test the impacts of competing transit services on the build alternatives. For this run, the build alternative was tested on 2010 highway and transit networks using the 2035 land use data.

Forecasts were also developed using FTA's Aggregate Rail Ridership Forecasting (ARRF-II) tool. The tool uses CTPP 2000 journey to work data and was developed to provide rail ridership estimates for New Starts cities. While ARRF-II's methodology is based on journey-to-work flows, its ridership forecast does reflect all work and non-work trips. For developing the future year forecasts using ARRF-II, CTPP trips were increased to reflect the corresponding future year trips based on the SERPM6.7 work trips. These forecasts were developed only for the fixed guideway portion of the project. It is important to note that ARRF-II does not take factors including highway or transit supply into consideration. ARRF-II is typically used in areas that currently do not have fixed-guideway service. The model area includes an urban fixed-guideway service in Miami-Dade County and a commuter rail system serving the three counties in the region. However, the fixed-guideway service proposed for this project is in an environment more sub-urban in nature than Miami-Dade's Metrorail. Therefore, the project team felt it was appropriate to develop ARRF-II forecasts for comparison purposes.

The travel demand model results show a modest increase in boardings between 2010 and 2016. This is due to the improved background transit system assumed in 2016 even though there is a 6-7% growth in regional person trips. The improved background transit system offers significant competitive bus service along Broward Boulevard. In addition, the I-595 express bus service and a local bus route along Griffin Road are providing travelers with more options.

The results from the Future Year Build, No Improvements in Highway/Transit service run (Run 2) also confirm this finding. The project daily boardings for this run increase to more than 13,000. The detailed boardings by transit route are provided in Appendix E.

Exhibit 16: Summary of Tests for Reasonableness of Forecasts

Run	Scenario	Land Use/ Person Trips	Transit/ Highway Networks	Sawgrass Premium Bus	CBT Guideway Project	Project Total	ARRF-II Boardings
-	Alternative Baseline					10,200	
1	Existing Year Build	2010	2010	900	8,400	9,300	8,500
2	Future Year Build, No Improvements in Highway/Transit Service	2035	2010	1,100	12,000	13,100	12,400
3	Interim Year Build	2016	*2016	800	8,600	9,400	10,900

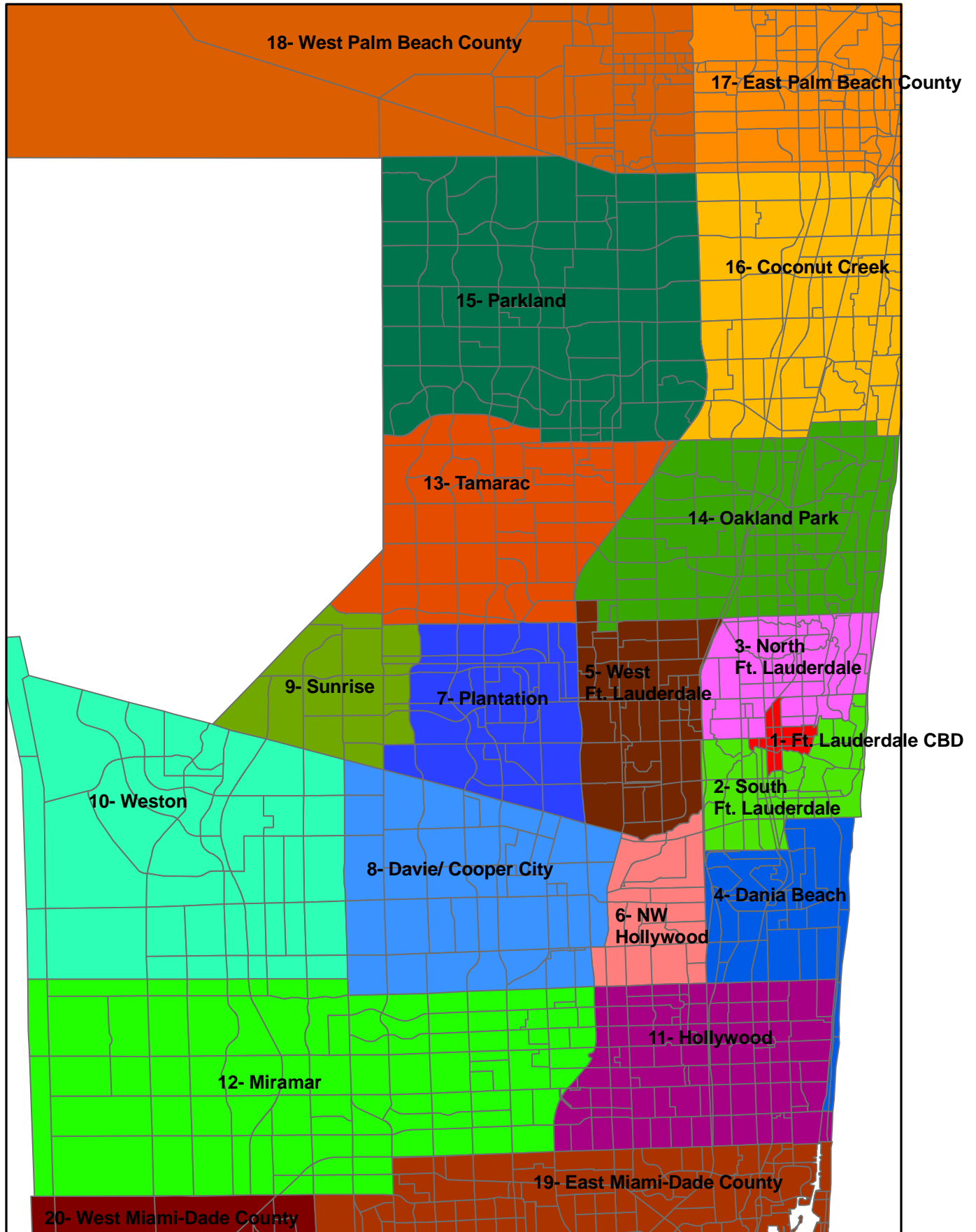
*Transit network is 2016 E + C network provided by Jacobs.

**For the purpose of sharing these numbers with the public, the projected boardings were rounded to the nearest hundreds. For this reason, the numbers shown in this table do not exactly match the numbers that appear in the appendices.

The increase in ARRF-II boardings between runs 1 and 2 (transit network is kept the same) is similar to the model's estimated boardings for the fixed guideway portion of the project. However, ARRF-II results show an increase in boardings between 2010 and 2016 in comparison to model forecasts. As mentioned previously, the lower forecast from the travel demand model is likely due to the competitive bus service captured by the travel model but not ARRF-II. Given these results, it appears that the travel demand model does a reasonable job in forecasting ridership for the Build Alternatives.

Appendix A: Corridor Districts Map

2010 BCT Survey- Districts



Appendix B: SERPM 6.7 Mode Choice Constants

Mode Choice Constants (Top Level)

Purpose	Market	Drive Alone	Shared Ride 2	Shared Ride 3+	Walk-LM-Walk	Walk-P-Walk	Walk-P-Auto	PnR-LM-Walk	PnR-P-Walk	PnR-P-Auto	KnR-LM-Walk	KnR-P-Walk	KnR-P-Auto
HBW PK	0 Car HHs	0.0000	-0.9250	-1.2636	0.6280	0.6280	0.1280	-0.5895	-0.5895	-1.0895	-1.0824	-1.0824	-1.5824
	Cars < Workers HHs	0.0000	-1.2000	-1.6136	0.1530	0.1530	-0.0970	-0.6145	-0.6145	-1.1145	-1.4324	-1.4324	-1.6824
	Cars >= Workers HHs	0.0000	-1.2075	-1.6386	-0.5470	-0.5470	-0.7970	-1.0645	-1.0645	-1.3145	-2.0324	-2.0324	-2.2824
HBO PK	0 Car HHs	0.0000	0.0320	-0.0713	-0.9480	-0.9480	-1.3480	-1.5747	-1.5747	-1.9747	-2.1349	-2.1349	-2.5349
	Cars < Workers HHs	0.0000	-0.0430	-0.1463	-1.8480	-1.8480	-1.9980	-2.0997	-2.0997	-2.2497	-2.9849	-2.9849	-3.1349
	Cars >= Workers HHs	0.0000	-0.0430	-0.1463	-1.8480	-1.8480	-1.9980	-2.0997	-2.0997	-2.2497	-2.9849	-2.9849	-3.1349
NHB PK	All HHs	0.0000	-0.3327	-0.5209	-1.3090	-1.3090	-1.5590	-1.3604	-1.3604	-1.6104	-2.0122	-2.0122	-2.2622
HBU PK	All HHs	0.0000	-0.0170	-0.1303	-1.1350	-1.1350	-1.2850	-1.7867	-1.7867	-1.9367	-2.0869	-2.0869	-2.2369
HBW OP	0 Car HHs	0.0000	-0.9415	-1.2539	0.8830	0.8830	0.3830	0.0304	0.0304	-0.4696	-0.0259	-0.0259	-0.5259
	Cars < Workers HHs	0.0000	-1.1915	-1.6039	0.3580	0.3580	0.1080	0.0554	0.0554	-0.4446	-0.4259	-0.4259	-0.6759
	Cars >= Workers HHs	0.0000	-1.1990	-1.6289	-0.2920	-0.2920	-0.5420	-0.3446	-0.3446	-0.5946	-1.0259	-1.0259	-1.2759
HBO OP	0 Car HHs	0.0000	0.0033	-0.0766	-1.1580	-1.1580	-1.5580	-1.6101	-1.6101	-2.0101	-2.2185	-2.2185	-2.6185
	Cars < Workers HHs	0.0000	-0.0467	-0.1516	-2.0330	-2.0330	-2.1830	-2.0851	-2.0851	-2.2351	-3.1185	-3.1185	-3.2685
	Cars >= Workers HHs	0.0000	-0.0467	-0.1516	-2.0330	-2.0330	-2.1830	-2.0851	-2.0851	-2.2351	-3.1185	-3.1185	-3.2685
NHB OP	All HHs	0.0000	-0.3500	-0.5442	-2.0380	-2.0380	-2.2880	-0.9126	-0.9126	-1.1626	-1.8503	-1.8503	-2.1003
HBU OP	All HHs	0.0000	-0.0217	-0.1266	-0.6500	-0.6500	-0.8000	-0.3749	-0.3749	-0.5249	-0.9530	-0.9530	-1.1030

Mode Choice Constants (Total Level in equivalent IVTT)

Purpose	Market	Drive Alone	Shared Ride 2	Shared Ride 3+	Walk-LM-Walk	Walk-P-Walk	Walk-P-Auto	PnR-LM-Walk	PnR-P-Walk	PnR-P-Auto	KnR-LM-Walk	KnR-P-Walk	KnR-P-Auto
HBW PK	0 Car HHs	-	(37)	(51)	25	25	5	(24)	(24)	(44)	(43)	(43)	(63)
	Cars < Workers HHs	-	(48)	(65)	6	6	(4)	(25)	(25)	(45)	(57)	(57)	(67)
	Cars >= Workers HHs	-	(48)	(66)	(22)	(22)	(32)	(43)	(43)	(53)	(81)	(81)	(91)
HBO PK	0 Car HHs	-	2	(5)	(63)	(63)	(90)	(105)	(105)	(132)	(142)	(142)	(169)
	Cars < Workers HHs	-	(3)	(10)	(123)	(123)	(133)	(140)	(140)	(150)	(199)	(199)	(209)
	Cars >= Workers HHs	-	(3)	(10)	(123)	(123)	(133)	(140)	(140)	(150)	(199)	(199)	(209)
NHB PK	All HHs	-	(13)	(21)	(52)	(52)	(62)	(54)	(54)	(64)	(80)	(80)	(90)
HBU PK	All HHs	-	(1)	(9)	(76)	(76)	(86)	(119)	(119)	(129)	(139)	(139)	(149)
HBW OP	0 Car HHs	-	(38)	(50)	35	35	15	1	1	(19)	(1)	(1)	(21)
	Cars < Workers HHs	-	(48)	(64)	14	14	4	2	2	(18)	(17)	(17)	(27)
	Cars >= Workers HHs	-	(48)	(65)	(12)	(12)	(22)	(14)	(14)	(24)	(41)	(41)	(51)
HBO OP	0 Car HHs	-	0	(5)	(77)	(77)	(104)	(107)	(107)	(134)	(148)	(148)	(175)
	Cars < Workers HHs	-	(3)	(10)	(136)	(136)	(146)	(139)	(139)	(149)	(208)	(208)	(218)
	Cars >= Workers HHs	-	(3)	(10)	(136)	(136)	(146)	(139)	(139)	(149)	(208)	(208)	(218)
NHB OP	All HHs	-	(14)	(22)	(82)	(82)	(92)	(37)	(37)	(47)	(74)	(74)	(84)
HBU OP	All HHs	-	(1)	(8)	(43)	(43)	(53)	(25)	(25)	(35)	(64)	(64)	(74)

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Appendix C: BCT Ridership Flow Tables

SERPM 6.7 (2010 Model) District-to-District Observed vs. Estimated Transit Trip Flows (BCT)
1/31/2012

DRAFT

2010 BCT Survey - District-to-District Flows

Production District	Attraction District																				Total	Total %	
	1	2	3	4	5	6	7	8	9	10	Corridor Subtotal	11	12	13	14	15	16	17	18	19			20
1-Ft Lauderdale CBD	17	88	72	18	31	8	82	6	8	0	331	6	4	28	154	57	23	0	0	109	0	712	1%
2-South Ft Lauderdale	242	504	215	97	258	102	131	76	33	7	1,666	115	35	71	494	30	123	4	1	90	5	2,634	3%
3-North Ft Lauderdale	628	818	1,450	384	746	119	377	241	191	10	4,964	148	54	195	1,331	201	404	67	0	71	33	7,468	9%
4-Dania Beach	184	63	733	277	54	80	18	150	14	15	1,588	746	136	71	161	29	66	69	4	169	4	3,042	4%
5-West Fort Lauderdale	733	673	1,002	48	1,091	168	919	421	642	40	5,737	517	143	529	1,437	408	505	107	68	322	10	9,784	12%
6-NW Hollywood	27	34	123	64	80	61	3	73	1	27	494	144	62	21	31	1	24	112	24	15	0	929	1%
7-Plantation	347	308	511	211	1,215	66	1,402	250	468	8	4,786	71	255	717	589	243	153	14	0	103	4	6,935	8%
8-Davie/Cooper City	60	175	16	126	261	186	175	223	115	32	1,370	61	108	34	114	6	96	4	0	118	4	1,914	2%
9-Sunrise	31	8	27	0	102	30	203	4	86	14	506	17	42	105	64	15	7	21	0	7	0	785	1%
10-Weston	3	0	7	0	0	0	12	21	78	30	150	0	55	2	9	11	0	0	0	28	0	255	0%
Corridor Subtotal	2,273	2,671	4,156	1,226	3,839	821	3,325	1,466	1,634	183	21,592												
11-Hollywood	209	217	301	773	369	582	116	475	47	77		4,346	1,298	131	469	117	68	8	0	1,349	56	11,007	13%
12-Miramar	108	21	88	156	117	204	254	431	129	41		774	1,288	60	178	69	6	17	14	765	50	4,769	6%
13-Tamarac	96	52	234	59	745	16	318	299	451	20		80	219	1,214	1,357	781	290	150	2	102	0	6,485	8%
14-Oakland Park	614	621	1,116	128	522	154	227	263	334	13		121	105	531	2,297	851	1,170	130	25	95	12	9,330	11%
15-Parkland	217	123	206	20	411	23	190	83	216	50		64	110	290	1,329	2,311	863	89	13	57	7	6,670	8%
16-Coconut Creek	119	214	550	121	229	43	48	130	39	1		27	83	134	1,989	780	1,594	165	16	55	1	6,339	8%
17-Eastern Palm Beach	0	41	57	5	74	27	80	2	8	0		1	2	10	91	16	201	4	0	8	0	628	1%
18-Western Palm Beach	0	0	4	0	4	0	5	0	7	0		0	0	10	4	37	0	0	0	0	0	72	0%
19-Eastern Miami-Dade	102	52	99	93	147	178	171	216	13	27		848	477	184	171	82	11	1	65	199	0	3,134	4%
20-Western Miami-Dade	0	14	15	0	3	0	8	14	4	2		23	52	0	3	10	0	0	0	0	0	146	0%
Total	3,737	4,025	6,825	2,581	6,460	2,048	4,741	3,380	2,881	414		8,110	4,526	4,335	12,271	6,056	5,603	963	232	3,662	186	83,037	100%
Total %	5%	5%	8%	3%	8%	2%	6%	4%	3%	0%		10%	5%	5%	15%	7%	7%	1%	0%	4%	0%	100%	

* 5,230 Community Buses (6.72%) are added to the observed trips

Intra-District Flows 18,396
% Intra-District Flows 22%

Top 10 corridor movements

BCT- Estimated District-to-District Flows

Production District	Attraction District																				Total	Total %		
	1	2	3	4	5	6	7	8	9	10	Corridor Subtotal	11	12	13	14	15	16	17	18	19			20	
1-Ft Lauderdale CBD	258	413	275	65	96	24	54	29	10	2	1,226	33	13	33	210	17	49	12	0	20	0	1,613	2%	
2-South Ft Lauderdale	773	920	393	149	169	49	112	64	13	14	2,655	84	23	35	359	41	75	8	1	41	2	3,324	4%	
3-North Ft Lauderdale	899	898	910	86	499	71	196	93	91	8	3,750	91	25	141	1,579	112	311	62	3	29	2	6,105	7%	
4-Dania Beach	203	366	122	555	74	207	141	161	15	6	1,850	589	71	36	201	37	69	7	1	186	5	3,051	4%	
5-West Fort Lauderdale	581	505	537	93	1,129	80	652	346	139	20	4,081	121	83	492	1,286	283	258	61	6	65	4	6,740	8%	
6-NW Hollywood	51	76	25	138	38	167	32	109	8	3	646	196	65	21	32	9	8	1	0	46	1	1,024	1%	
7-Plantation	256	174	149	62	526	34	1,743	549	342	41	3,876	75	103	746	531	249	138	36	3	60	6	5,824	7%	
8-Davie/Cooper City	68	87	24	101	107	139	383	842	67	55	1,874	217	500	87	85	40	11	2	1	89	7	2,911	3%	
9-Sunrise	64	30	30	12	66	8	386	139	271	58	1,064	19	50	197	79	39	14	2	1	27	4	1,495	2%	
10-Weston	20	12	9	9	21	7	97	136	129	212		652	30	159	31	25	10	7	2	0	68	10	993	1%
Corridor Subtotal	3,172	3,481	2,474	1,270	2,724	785	3,796	2,467	1,086	419	21,675													
11-Hollywood	259	271	85	791	150	375	202	360	31	45		2,786	836	74	301	122	79	26	7	998	31	7,828	9%	
12-Miramar	92	87	32	130	95	149	223	638	93	202		1,000	3,576	112	125	60	28	6	1	565	53	7,269	9%	
13-Tamarac	158	109	115	30	305	16	637	231	242	40		58	97	1,826	1,139	1,229	204	34	9	56	6	6,542	8%	
14-Oakland Park	573	423	760	64	541	32	200	68	45	14		80	38	447	3,367	507	951	97	8	34	2	8,249	10%	
15-Parkland	172	68	98	23	151	12	216	97	54	16		44	58	633	880	4,345	733	121	97	50	6	7,873	9%	
16-Coconut Creek	117	105	112	22	70	5	37	23	11	3		21	17	101	1,239	566	2,571	357	24	10	2	5,412	6%	
17-Eastern Palm Beach	27	36	41	13	20	5	49	12	14	5		13	36	28	129	108	309	16	2	4	0	866	1%	
18-Western Palm Beach	8	6	6	3	8	1	12	5	5	1		5	6	17	65	194	68	2	11	2	0	425	1%	
19-Eastern Miami-Dade	239	332	119	471	234	176	302	447	128	66		1,471	1,208	174	378	270	167	14	8	428	4	6,636	8%	
20-Western Miami-Dade	11	43	27	27	27	9	36	34	17	12		102	143	26	24	46	8	0	0	5	0	597	1%	
Total	4,827	4,960	3,870	2,843	4,325	1,567	5,709	4,382	1,725	822		7,036	7,104	5,257	12,034	8,285	6,057	865	182	2,782	145	84,777	100%	
Total %	6%	6%	5%	3%	5%	2%	7%	5%	2%	1%		8%	8%	6%	14%	10%	7%	1%	0%	3%	0%	100%		

Top 10 corridor movements

Intra-District Flows 25,933
% Intra-District Flows 31%

SERPM 6.7 (2010 Model) District-to-District Observed vs. Estimated Transit Trip Flows (BCT)
8/8/2012

DRAFT

2010 BCT Survey (zero car) - District-to-District Flows

Production District	Attraction District																				Total	Total %							
	1	2	3	4	5	6	7	8	9	10	Corridor Subtotal												11	12	13	14	15	16	17
1-Ft Lauderdale CBD	17	14	19	1	24	2	30	0	0	0	106	6	0	22	47	38	13	0	0	105	0	337	1%						
2-South Ft Lauderdale	189	212	121	38	73	91	69	29	28	5	854	79	22	60	272	17	32	3	0	52	5	1,397	4%						
3-North Ft Lauderdale	283	325	664	108	476	52	144	60	89	4	2,206	56	36	105	752	115	186	44	0	25	15	3,541	11%						
4-Dania Beach	94	13	35	116	22	39	6	45	0	0	370	439	18	62	58	11	36	56	0	53	4	1,107	3%						
5-West Fort Lauderdale	135	336	286	29	524	181	470	68	227	24	2,282	201	31	245	704	172	212	48	47	94	0	4,036	12%						
6-NW Hollywood	16	8	33	23	6	10	4	15	0	27	142	17	26	18	21	0	0	0	0	3	0	227	1%						
7-Plantation	254	84	247	176	430	24	1,011	69	161	2	2,457	38	46	382	265	59	46	6	0	22	0	3,321	10%						
8-Davie/Cooper City	8	125	4	31	15	52	39	117	17	25	432	29	55	10	88	0	0	0	0	35	0	649	2%						
9-Sunrise	0	0	18	0	3	0	20	3	30	14	89	0	0	26	5	1	4	5	0	2	0	132	0%						
10-Weston	0	0	0	0	0	0	0	7	26	11	44	0	14	2	0	0	0	0	0	7	0	67	0%						
Corridor Subtotal	995	1,117	1,428	521	1,574	450	1,792	415	578	112	8,982																		
11-Hollywood	148	130	163	453	242	127	51	296	13	42	2,040	528	56	306	14	33	8	0	690	50	5,390	16%							
12-Miramar	94	0	47	7	11	64	127	60	22	14	143	278	7	59	0	4	0	14	102	8	1,062	3%							
13-Tamarac	15	26	67	14	265	0	115	118	88	4	29	67	500	440	270	160	90	2	13	0	2,284	7%							
14-Oakland Park	310	259	337	93	260	98	123	87	85	10	54	38	239	1,062	323	484	11	0	5	12	3,888	12%							
15-Parkland	20	65	43	6	58	0	78	10	37	0	4	3	90	387	595	235	7	6	14	0	1,657	5%							
16-Coconut Creek	33	65	87	8	132	7	19	39	15	0	14	3	82	673	300	574	55	16	5	1	2,129	6%							
17-Eastern Palm Beach	0	6	38	0	7	0	0	0	7	0	0	2	4	32	0	92	0	0	0	0	188	1%							
18-Western Palm Beach	0	0	0	0	0	0	5	0	7	0	0	0	0	0	5	0	0	0	0	0	17	0%							
19-Eastern Miami-Dade	20	25	79	25	39	48	71	109	6	10	503	193	42	79	14	1	28	43	0	1,336	4%								
20-Western Miami-Dade	0	14	0	0	0	0	5	0	0	2	0	11	0	0	9	0	0	0	0	0	41	0%							
Total	1,636	1,708	2,289	1,128	2,588	794	2,385	1,134	859	192	3,653	1,372	1,951	5,251	1,943	2,112	333	114	1,269	96	32,806	100%							
Total %	5%	5%	7%	3%	8%	2%	7%	3%	3%	1%	11%	4%	6%	16%	6%	6%	1%	0%	4%	0%	100%								

* 5,230 Community Buses (6.72%) are added to the observed trips

Intra-District Flows 7,803
% Intra-District Flows 24%

Top 10 corridor movements

BCT- Estimated (zero car) District-to-District Flows

Production District	Attraction District																				Total	Total %							
	1	2	3	4	5	6	7	8	9	10	Corridor Subtotal												11	12	13	14	15	16	17
1-Ft Lauderdale CBD	45	65	38	7	17	11	22	13	1	0	220	1	8	22	41	7	23	9	0	2	0	334	1%						
2-South Ft Lauderdale	175	176	47	9	62	7	58	27	3	11	575	14	7	18	149	28	40	4	0	3	0	838	3%						
3-North Ft Lauderdale	376	451	379	34	245	53	122	67	74	4	1,805	49	16	91	895	77	206	54	3	7	1	3,205	10%						
4-Dania Beach	15	69	25	160	19	129	88	117	4	2	628	158	16	14	32	9	24	4	0	27	1	911	3%						
5-West Fort Lauderdale	238	187	213	31	388	29	261	207	84	9	1,647	27	41	293	667	184	166	54	4	22	1	3,106	10%						
6-NW Hollywood	13	16	6	11	8	53	10	37	1	1	156	26	22	14	9	4	4	1	0	4	0	239	1%						
7-Plantation	60	57	44	19	177	10	516	306	124	7	1,319	18	22	347	265	148	101	33	2	8	1	2,265	7%						
8-Davie/Cooper City	4	26	2	21	16	30	80	267	15	20	480	31	202	30	32	17	2	1	0	7	1	803	3%						
9-Sunrise	21	2	5	3	12	1	80	82	33	6	245	1	12	28	27	8	5	1	0	2	1	331	1%						
10-Weston	1	1	0	0	4	1	32	55	15	30	139	6	48	4	1	1	1	0	5	0	206	1%							
Corridor Subtotal	949	1,050	760	294	948	323	1,268	1,177	355	90	7,213																		
11-Hollywood	128	129	40	309	75	197	138	182	19	36	955	387	49	213	102	61	25	7	268	9	3,329	11%							
12-Miramar	28	30	10	17	32	53	72	264	34	105	264	1,141	60	61	23	17	4	1	125	11	2,351	7%							
13-Tamarac	45	35	26	12	56	2	130	136	44	15	12	46	428	365	435	58	23	2	6	1	1,874	6%							
14-Oakland Park	127	82	125	15	129	9	69	23	13	5	28	13	170	885	267	327	62	3	5	0	2,358	8%							
15-Parkland	56	10	36	9	29	3	50	49	10	6	8	18	81	262	1,350	129	59	42	5	0	2,210	7%							
16-Coconut Creek	27	26	23	4	22	1	12	13	5	1	8	7	55	436	267	878	206	14	2	0	2,007	6%							
17-Eastern Palm Beach	3	3	11	0	1	0	1	1	0	0	1	4	1	15	23	46	5	0	0	0	117	0%							
18-Western Palm Beach	0	1	0	0	1	0	2	1	1	0	0	1	2	26	74	13	1	6	0	0	130	0%							
19-Eastern Miami-Dade	166	260	86	310	181	120	235	345	109	55	734	850	140	308	228	154	13	7	124	2	4,427	14%							
20-Western Miami-Dade	6	34	24	18	19	6	18	21	10	8	70	79	17	13	37	4	0	0	1	0	384	1%							
Total	1,535	1,660	1,143	988	1,492	714	1,996	2,213	599	320	2,411	2,939	1,862	4,700	3,289	2,259	559	92	623	29	31,425	100%							
Total %	5%	5%	4%	3%	5%	2%	6%	7%	2%	1%	8%	9%	6%	15%	10%	7%	2%	0%	2%	0%	100%								

Intra-District Flows 7,818
% Intra-District Flows 25%

Top 10 corridor movements

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Appendix D: Detailed Boarding Results For Build Alternatives

All Trips

Station Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total	
1 - Tri-Rail FLL/I-95	2	221	398	75	207	564	139	0	0	0	70	9	2	7	1,693	44.8%
2 - FLL Airport	72	0	34	4	27	30	13	0	0	0	2	1	2	16	200	5.3%
3 - WAVE 16th St	41	4	0	8	17	33	11	0	0	0	6	2	2	11	137	3.6%
4 - WAVE 12th St	21	2	11	0	1	13	5	0	0	0	4	1	1	8	67	1.8%
5 - WAVE 7th St (NB)	0	0	0	0	0	8	0	0	0	0	20	4	3	23	58	1.5%
6 - WAVE Las Olas Blvd	50	7	29	5	0	0	3	1	2	0	7	7	3	16	130	3.4%
7 - WAVE Andrews (NB)	0	0	0	0	0	0	0	0	0	0	3	3	2	1	8	0.2%
8 - WAVE 6th & Andrews (SB)	24	9	18	3	0	0	0	0	0	0	0	0	0	0	54	1.4%
9 - WAVE 6th St (SB)	8	2	6	0	0	0	0	0	0	0	0	0	0	0	18	0.5%
10 - WAVE Andrews (SB)	5	0	0	0	0	2	0	0	0	0	0	0	0	0	7	0.2%
11 - Broward/ 2nd Ave	109	6	45	12	0	23	0	12	58	1	0	3	4	2	276	7.3%
12 - Broward/ 5th Ave	17	1	13	4	0	2	0	3	4	0	3	0	4	0	53	1.4%
13 - Broward/ 15th Ave	8	4	9	2	0	12	0	1	10	2	2	4	0	3	57	1.5%
14 - Broward Tri-Rail St	44	27	172	52	0	236	0	32	188	79	118	27	45	0	1,019	27.0%
Total	401	285	735	164	253	922	171	49	262	82	235	61	69	87	3,777	100.0%
	10.6%	7.5%	19.4%	4.3%	6.7%	24.4%	4.5%	1.3%	6.9%	2.2%	6.2%	1.6%	1.8%	2.3%	100%	
										WB/SB Stations			EB/NB Stations			

Direction	Trips	
Eastbound	2,058	54.6%
Westbound	1,710	45.4%
Total	3,768	100.0%

Access Type	Trips	
Walk	2,263	59.9%
PnR	1,115	29.5%
KnR	399	10.6%
Total	3,777	100.0%

Time Period	Trips	
Peak	2,614	69.4%
Off-Peak	1,154	30.6%
Total	3,768	100.0%

Intermodal Trips on Light Rail

Mode Used/Access Type	Walk	PnR	KnR	Total
Light Rail & Tri-Rail	30	80	23	133
Light Rail & Sawgrass Rapid Bus	72	1	1	74
Light Rail & All BCT Rapid Buses	720	50	23	793
Light Rail & WAVE	10	0	0	10

*Trip could have involved more than the two modes mentioned above

Rapid Bus Boardings

Station Name	Bank Atlantic - BCT Terminal				Nova Dr/University Dr - BCT Terminal			
	Eastbound		Westbound		Eastbound		Westbound	
	On	Off	On	Off	On	Off	On	Off
Bank Atlantic	189	0	0	107	-	-	-	-
Corporate Park	94	74	12	424	-	-	-	-
136th Ave	186	9	53	61	-	-	-	-
Nova Dr/University Dr	595	110	332	56	595	0	0	56
Nova Dr/70th Ave	39	641	12	498	39	468	2	498
Nova Dr/Davie Rd	85	57	50	47	85	39	10	47
SR 7/Davie Blvd	30	80	312	15	30	58	265	15
SR7/ Broward Blvd	174	27	109	89	174	21	95	89
Broward / 31st Ave	16	14	53	4	16	14	50	4
Broward / I-95 (TRI-RAIL)	225	116	88	26	225	90	70	26
Broward 15th Ave	38	15	31	5	38	12	26	5
Broward 5th Ave	2	83	43	1	2	81	37	1
Broward 2nd Ave	0	7	7	0	0	6	6	0
Central Broward Bus Terminal	0	443	230	0	0	414	178	0
Total	1673	1676	1332	1333	1204	1203	739	741

All Trips

Station Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total
1 - University/Nova	0	279	63	544	47	78	77	206	136	65	123	17	66	99	52	0	0	0	7	2	0	1	1,863
2 - Nova / 70th Ave	8	0	14	12	6	33	4	15	15	2	10	1	3	7	5	0	0	0	6	2	0	1	143
3 - Nova / Davie	19	6	0	2	13	50	6	16	16	4	10	3	3	6	6	0	0	0	5	1	5	1	169
4 - Davie / Oaks	13	2	0	0	9	25	5	7	13	4	10	2	4	7	5	0	0	0	4	1	0	0	111
5 - Griffin/Davie	14	6	2	40	0	54	26	31	50	24	49	10	26	45	28	0	0	0	19	2	0	0	427
6 - Griffin/SR 7	30	57	32	395	225	0	149	196	147	130	136	28	100	133	49	0	0	0	1	0	0	0	1,808
7 - Griffin/32nd Ave	66	5	9	19	29	173	0	15	39	11	24	8	9	21	14	0	0	0	23	6	1	2	475
8 - Tri-Rail FLL/I-95	55	83	32	187	81	63	35	0	170	238	293	60	169	514	167	0	0	0	57	7	1	6	2,217
9 - FLL Airport	202	38	23	105	64	198	19	73	0	51	14	4	22	28	12	0	0	0	2	1	2	6	863
10 - SW 4th Ave/SE 24th St	13	2	1	8	7	25	1	9	12	0	14	5	13	34	12	0	0	0	12	2	4	2	176
11 - WAVE 16th St	19	6	4	15	9	29	7	28	3	10	0	3	12	24	9	0	0	0	5	2	2	4	191
12 - WAVE 12th St	4	2	1	5	3	8	2	16	2	7	8	0	1	13	5	0	0	0	5	1	1	4	87
13 - WAVE 7th St (NB)	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	21	4	4	9	45
14 - WAVE Las Olas Blvd	12	7	4	27	18	22	6	42	7	26	24	5	0	0	3	1	2	0	8	7	3	9	233
15 - WAVE Andrews (NB)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2	1	9
16 - WAVE 6th & Andrews (SB)	7	2	1	11	9	14	2	21	9	13	14	3	0	0	0	0	0	0	0	0	0	0	106
17 - WAVE 6th St (SB)	3	1	1	5	3	6	2	7	2	6	5	0	0	0	0	0	0	0	0	0	0	0	41
18 - WAVE Andrews (SB)	0	1	0	4	2	0	0	5	0	3	0	0	0	2	0	0	0	0	0	0	0	0	19
19 - Broward/ 2nd Ave	3	12	11	67	22	4	28	84	7	51	34	11	0	26	0	12	61	1	0	3	4	2	445
20 - Broward/ 5th Ave	0	5	3	10	4	1	3	17	1	7	12	4	0	2	0	3	5	0	3	0	4	1	84
21 - Broward/ 15th Ave	0	1	0	4	1	0	1	9	1	16	6	2	0	12	0	1	10	2	2	4	0	5	79
22 - Broward Tri-Rail St	1	3	1	12	9	2	2	20	15	30	91	33	0	187	0	26	130	73	111	26	36	0	807
Total	468	517	203	1,471	562	786	375	816	645	699	876	199	429	1,167	366	43	208	76	293	74	69	54	10,396
	4.5%	5.0%	2.0%	14.2%	5.4%	7.6%	3.6%	7.8%	6.2%	6.7%	8.4%	1.9%	4.1%	11.2%	3.5%	0.4%	2.0%	0.7%	2.8%	0.7%	0.7%	0.5%	100%

WB/SB Stations EB/NB Stations

Direction	Trips	%
Eastbound	5,954	57.4%
Westbound	4,426	42.6%
Total	10,380	100.0%

Trips By Segment	Boardings		Attractions	
	#	%	#	%
University/Nova - Tri-Rail FLL/I-95	4,996	48.1%	4,381	42.1%
Tri-Rail FLL/I-95 - Broward Tri-Rail St	5,400	51.9%	6,015	57.9%
Total	10,396	100.0%	10,396	100.0%

Access Type	Trips	%
Walk	7,473	71.9%
PnR	2,039	19.6%
KnR	884	8.5%
Total	10,396	100.0%

Time Period	Trips	%
Peak	6,518	62.8%
Off-Peak	3,862	37.2%
Total	10,380	100.0%

Intermodal Trips on Light Rail

Mode Used/Access Type	Walk	PnR	KnR	Total
Light Rail & Tri-Rail	82	166	48	296
Light Rail & Sawgrass Rapid Bus	170	4	1	175
Light Rail & All BCT Rapid Buses	3,800	145	152	4,097
Light Rail & WAVE	28	0	0	28

* Trip could have involved more than the two modes mentioned above

All Trips

Station Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1 - Tri-Rail FLL/I-95	0	236	308	391	79	227	598	205	0	0	0	72	9	2	8	2,134
2 - FLL Airport	120	0	61	15	4	27	29	12	0	0	0	2	1	2	9	281
3 - SW 4th Ave/SE 24th St	19	13	0	15	6	13	34	12	0	0	0	13	2	4	5	135
4 - WAVE 16th St	50	3	10	0	3	12	24	9	0	0	0	6	2	2	6	128
5 - WAVE 12th St	23	2	11	8	0	1	13	5	0	0	0	5	1	1	5	75
6 - WAVE 7th ST (NB)	0	0	0	0	0	0	8	0	0	0	0	21	3	4	13	49
7 - WAVE Las Olas Blvd	62	8	26	24	5	0	0	3	1	2	0	8	7	3	12	160
8 - WAVE Andrews (NB)	0	0	0	0	0	0	0	0	0	0	0	3	3	2	1	9
9 - WAVE 6th & Andrews (SB)	30	9	13	15	3	0	0	0	0	0	0	0	0	0	0	70
10 - WAVE 6th St (SB)	13	3	6	5	0	0	0	0	0	0	0	0	0	0	0	27
11 - WAVE Andrews (SB)	6	0	3	0	0	0	2	0	0	0	0	0	0	0	0	12
12 - Broward/ 2nd Ave	89	7	63	42	13	0	26	0	12	63	1	0	4	4	3	327
13 - Broward/ 5th Ave	18	1	7	12	4	0	2	0	3	4	0	3	0	4	1	59
14 - Broward/ 15th Ave	10	1	18	6	2	0	13	0	1	11	2	2	4	0	5	74
15 - Broward Tri-Rail St	24	20	53	122	44	0	211	0	30	160	78	120	27	38	0	928
Total	463	303	579	655	163	281	959	246	47	241	81	254	63	66	65	4,467
	10.4%	6.8%	13.0%	14.7%	3.6%	6.3%	21.5%	5.5%	1.1%	5.4%	1.8%	5.7%	1.4%	1.5%	1.5%	100%
							WB/SB Stations					EB/NB Stations				

Direction	Trips	
Eastbound	2,598	58.3%
Westbound	1,862	41.7%
Total	4,460	100.0%

Trips by Segment (CBT Rail + Rapid Bus)	1	2	3	Total	
1 - Sawgrass Mills - University/Nova	168	401	0	569	7.2%
2 - University/Nova - Tri-Rail FLL/I-95	552	1,134	720	2,406	30.4%
3 - Tri-Rail FLL/I-95 - Broward Tri-Rail St	0	463	4,467	4,930	62.4%
Total	720	1,998	5,187	7,905	100.0%
	9.1%	25.3%	65.6%		

Access Type	Trips	
Walk	2,803	62.7%
PnR	1,206	27.0%
KnR	459	10.3%
Total	4,467	100.0%

Time Period	Trips	
Peak	3,118	69.9%
Off-Peak	1,342	30.1%
Total	4,460	100.0%

Intermodal Trips on Light Rail

Mode Used/Access Type	Walk	PnR	KnR	Total
Light Rail & Tri-Rail	33	84	25	142
Light Rail & Sawgrass Rapid Bus	143	1	2	146
Light Rail & All BCT Rapid Buses	935	53	28	1,016
Light Rail & All BCT Local Buses	889	68	96	1,053
Light Rail & WAVE	15	0	0	15

*Trip could have involved more than the two modes mentioned above

Rapid Bus Boardings

Station Name	Bank Atlantic - FLL Tri-Rail St				Nova Dr/University Dr - FLL Tri-Rail St			
	Eastbound		Westbound		Eastbound		Westbound	
	On	Off	On	Off	On	Off	On	Off
Bank Atlantic	200	0	0	137	-	-	-	-
Corporate Park	109	86	13	390	-	-	-	-
136th Ave	192	14	55	90	-	-	-	-
University/Nova	119	173	357	43	119	0	0	43
Nova / 70th Ave	166	49	0	56	166	49	0	56
Nova / Davie	47	36	23	24	47	30	9	24
Davie / Oaks	18	146	14	211	18	51	1	211
Griffin/Davie	60	27	26	41	60	9	7	41
Griffin/SR 7	222	102	207	112	222	76	155	112
Griffin/32nd Ave	26	129	162	13	26	120	129	13
Tri-Rail FLL/I-95	0	393	263	0	0	323	200	0
Total	1159	1155	1120	1117	658	658	501	500

All Trips

Station Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total
1 - University/Nova	0	302	68	524	142	129	49	258	155	53	159	26	84	128	85	0	0	0	38	10	3	6	2,219
2 - Nova / 70th Ave	18	0	12	18	17	31	4	20	11	2	9	1	4	8	6	0	0	0	8	6	0	2	176
3 - Nova / Davie	43	27	0	22	25	53	4	25	9	4	10	3	3	8	6	0	0	0	9	4	7	1	261
4 - Davie / Oaks	18	2	4	0	16	27	4	7	10	3	9	1	3	7	4	0	0	0	7	3	0	1	128
5 - Griffin/Davie	27	18	26	85	0	52	22	48	36	26	48	9	34	58	41	0	0	0	44	12	2	2	590
6 - Griffin/SR 7	97	65	54	377	89	0	89	140	83	85	123	19	78	119	97	0	0	0	74	8	1	1	1,600
7 - Griffin/32nd Ave	45	5	5	17	35	94	0	26	32	11	20	7	10	19	13	0	0	0	34	11	2	3	390
8 - Tri-Rail FLL/I-95	130	86	26	266	109	75	42	0	98	71	120	24	61	139	67	0	0	0	33	14	4	15	1,379
9 - FLL Airport	182	28	15	54	25	98	17	27	0	23	20	3	7	17	10	0	0	0	2	3	4	13	548
10 - SW 4th Ave/SE 24th St	12	2	1	8	8	18	2	11	11	0	32	6	14	35	15	0	0	0	7	3	6	3	195
11 - WAVE 16th St	16	7	3	14	11	28	6	37	4	28	0	7	16	43	16	0	0	0	3	3	4	11	258
12 - WAVE 12th St	4	2	1	7	4	7	2	24	3	13	26	0	2	22	10	0	0	0	2	1	3	7	138
13 - WAVE 7th St (NB)	0	0	0	0	0	0	0	0	0	0	0	0	0	11	2	0	0	0	3	6	5	13	39
14 - WAVE Las Olas Blvd	14	10	3	32	20	26	7	32	6	33	41	9	0	0	8	1	5	0	1	5	5	29	287
15 - WAVE Andrews (NB)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	2	9	18
16 - WAVE 6th & Andrews (SB)	8	5	2	14	11	16	2	18	5	17	27	5	0	0	0	0	0	0	0	0	0	0	130
17 - WAVE 6th St (SB)	6	1	0	4	4	9	1	5	1	5	8	0	0	0	0	1	0	0	0	0	0	0	47
18 - WAVE Andrews (SB)	6	1	0	8	6	2	1	7	1	5	0	0	0	4	0	0	0	0	0	0	0	0	42
19 - Broward/ 2nd Ave	58	22	10	85	23	50	31	67	2	47	19	6	0	3	0	0	5	0	0	1	3	70	499
20 - Broward/ 5th Ave	6	8	2	19	8	8	5	16	3	12	20	8	0	8	0	3	8	2	7	0	7	8	155
21 - Broward/ 15th Ave	2	2	1	5	4	3	2	11	11	21	30	6	0	45	0	3	22	7	16	8	0	7	205
22 - Broward Tri-Rail St	4	9	15	29	7	4	19	161	404	226	90	0	374	0	31	238	125	695	184	61	0	2,706	
Total	695	601	250	1,588	584	735	293	797	642	864	946	229	316	1,047	380	0.3%	2.3%	1.1%	8.2%	2.4%	1.0%	1.7%	100%

Direction	Trips	%
Eastbound	5,431	45.2%
Westbound	6,577	54.8%
Total	12,008	100.0%

Access Type	Trips	%
Walk	7,424	61.8%
PnR	2,959	24.6%
KnR	1,627	13.5%
Total	12,010	100.0%

Time Period	Trips	%
Peak	7,869	65.5%
Off-Peak	4,139	34.5%
Total	12,008	100.0%

Intermodal Trips on Light Rail				
Mode Used/Access Type	Walk	PnR	KnR	Total
Light Rail & Tri-Rail	412	311	197	920
Light Rail & Sawgrass Rapid Bus	451	34	30	515
Light Rail & All BCT Rapid Buses	451	34	30	515
Light Rail & WAVE	95	1	2	98

* Trip could have involved more than the two modes mentioned above

Trips By Segment	Boardings		Attractions	
	#	%	#	%
University/Nova - Tri-Rail FLL/I-95	5,363	44.7%	4,746	39.5%
Tri-Rail FLL/I-95 - Broward Tri-Rail St	6,646	55.3%	7,264	60.5%
Total	12,010	100.0%	12,010	100.0%

All Trips

Station Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total	
1 - University/Nova	0	274	37	362	58	94	33	165	114	41	136	19	69	108	69	0	0	0	22	7	2	3	1,613	19.1%
2 - Nova / 70th Ave	14	0	8	16	12	25	3	12	9	1	9	1	3	7	4	0	0	0	6	5	0	1	136	1.6%
3 - Nova / Davie	36	15	0	19	19	43	3	17	8	3	9	2	3	8	4	0	0	0	7	3	6	0	205	2.4%
4 - Davie / Oaks	11	3	3	0	9	19	3	5	6	3	8	1	3	7	4	0	0	0	5	2	0	1	93	1.1%
5 - Griffin/Davie	19	14	4	63	0	34	13	30	28	21	44	7	28	56	36	0	0	0	27	7	2	2	435	5.2%
6 - Griffin/SR 7	80	68	26	278	57	0	69	82	63	78	139	17	79	122	97	0	0	0	62	6	1	1	1,327	15.7%
7 - Griffin/32nd Ave	36	4	5	12	30	75	0	21	26	9	22	6	7	18	13	0	0	0	28	9	2	2	325	3.8%
8 - Tri-Rail FLL/I-95	130	72	21	202	79	61	33	0	87	98	153	32	60	122	66	0	0	0	30	11	4	8	1,267	15.0%
9 - FLL Airport	171	30	9	45	20	77	14	16	0	20	20	3	7	19	11	0	0	0	2	3	3	9	480	5.7%
10 - SW 4th Ave/SE 24th St	12	2	1	6	6	14	1	8	8	0	28	6	13	35	12	0	0	0	6	2	5	3	168	2.0%
11 - WAVE 16th St	14	6	2	11	8	23	5	29	3	26	0	5	14	40	15	0	0	0	3	2	4	8	217	2.6%
12 - WAVE 12th St	2	2	0	4	4	5	1	12	2	9	21	0	1	19	9	0	0	0	1	1	2	3	98	1.2%
13 - WAVE 7th St (NB)	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2	0	0	0	2	5	3	9	32	0.4%
14 - WAVE Las Olas Blvd	11	5	2	20	16	19	5	24	4	27	33	8	0	0	8	1	4	0	1	5	4	20	215	2.6%
15 - WAVE Andrews (NB)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	2	6	13	0.2%
16 - WAVE 6th & Andrews (SB)	5	2	1	9	8	11	2	11	3	14	27	4	0	0	0	0	0	0	0	0	0	0	97	1.1%
17 - WAVE 6th St (SB)	4	1	0	4	3	5	0	5	1	5	6	0	0	0	0	1	0	0	0	0	0	0	36	0.4%
18 - WAVE Andrews (SB)	3	1	0	4	4	2	0	4	1	4	0	0	0	4	0	0	0	0	0	0	0	0	29	0.3%
19 - Broward/ 2nd Ave	28	17	5	57	13	30	18	42	2	35	15	4	0	5	0	4	0	0	1	3	37	313	3.7%	
20 - Broward/ 5th Ave	4	6	2	13	6	6	4	12	2	9	16	6	0	6	0	2	8	1	6	0	5	6	121	1.4%
21 - Broward/ 15th Ave	1	1	1	5	3	1	1	7	9	18	23	4	0	33	0	2	22	9	12	5	0	5	162	1.9%
22 - Broward Tri-Rail St	3	5	1	15	15	5	2	13	12	24	136	42	0	237	0	28	139	104	209	28	38	0	1,056	12.5%
Total	584	527	128	1,146	367	547	213	516	388	444	845	170	288	854	352	35	177	114	432	103	84	123	8,436	100.0%
	6.9%	6.3%	1.5%	13.6%	4.4%	6.5%	2.5%	6.1%	4.6%	5.3%	10.0%	2.0%	3.4%	10.1%	4.2%	0.4%	2.1%	1.3%	5.1%	1.2%	1.0%	1.5%	100%	

Direction	Trips	
Eastbound	4,413	52.4%
Westbound	4,008	47.6%
Total	8,421	100.0%

Access Type	Trips	
Walk	5,355	63.5%
PnR	2,088	24.8%
KnR	993	11.8%
Total	8,436	100.0%

Time Period	Trips	
Peak	5,012	59.5%
Off-Peak	3,409	40.5%
Total	8,421	100.0%

Intermodal Trips on Light Rail

Mode Used/Access Type	Walk	PnR	KnR	Total
Light Rail & Tri-Rail	397	378	272	1,047
Light Rail & Sawgrass Rapid Bus	367	27	27	421
Light Rail & All BCT Rapid Buses	367	27	27	421
Light Rail & WAVE	58	0	3	61

* Trip could have involved more than the two modes mentioned above

Trips By Segment	Boardings		Attractions	
	#	%	#	%
University/Nova - Tri-Rail FLL/I-95	4,132	49.0%	3,512	41.6%
Tri-Rail FLL/I-95 - Broward Tri-Rail St	4,304	51.0%	4,925	58.4%
Total	8,436	100.0%	8,436	100.0%

All Trips

Station Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total	
1 - University/Nova	0	205	43	479	61	77	38	152	65	44	122	16	54	101	48	0	0	0	12	5	2	2	1,525	17.7%
2 - Nova / 70th Ave	14	0	10	15	12	25	3	14	8	1	7	2	4	6	6	0	0	0	5	4	0	1	137	1.6%
3 - Nova / Davie	42	13	0	15	20	42	3	17	6	3	9	2	3	7	4	0	0	0	5	3	6	1	201	2.3%
4 - Davie / Oaks	13	2	1	0	9	25	3	7	5	3	9	1	3	6	5	0	0	0	5	3	0	1	102	1.2%
5 - Griffin/Davie	19	13	5	58	0	37	14	27	19	20	40	7	25	53	30	0	0	0	23	9	1	1	402	4.7%
6 - Griffin/SR 7	32	50	25	291	65	0	91	134	54	85	134	21	78	132	87	0	0	0	34	5	0	1	1,318	15.3%
7 - Griffin/32nd Ave	36	4	5	14	24	103	0	23	17	11	21	10	9	17	14	0	0	0	13	10	1	3	336	3.9%
8 - Tri-Rail FLL/I-95	168	64	27	249	106	118	22	0	34	134	238	49	94	195	96	0	0	0	55	37	3	12	1,701	19.7%
9 - FLL Airport	86	12	4	9	18	68	5	16	0	12	15	3	8	21	14	0	0	0	3	3	2	4	303	3.5%
10 - SW 4th Ave/SE 24th St	12	2	1	7	7	17	1	9	6	0	24	7	14	35	15	0	0	0	5	3	4	3	173	2.0%
11 - WAVE 16th St	12	7	2	14	9	26	6	30	4	21	0	4	13	37	15	0	0	0	3	2	3	9	217	2.5%
12 - WAVE 12th St	2	1	0	5	3	5	2	21	2	11	13	0	1	19	9	0	0	0	2	1	2	5	105	1.2%
13 - WAVE 7th St (NB)	0	0	0	0	0	0	0	0	0	0	0	0	0	11	4	0	0	0	3	5	3	14	39	0.5%
14 - WAVE Las Olas Blvd	9	6	2	24	18	21	4	37	5	27	32	8	0	0	8	1	4	0	2	5	3	24	240	2.8%
15 - WAVE Andrews (NB)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	2	4	11	0.1%
16 - WAVE 6th & Andrews (SB)	4	7	2	23	10	13	4	19	4	22	17	3	0	0	0	0	0	0	0	0	0	0	127	1.5%
17 - WAVE 6th St (SB)	5	1	0	5	2	7	1	6	1	5	6	1	0	0	0	1	0	0	0	0	0	0	41	0.5%
18 - WAVE Andrews (SB)	7	4	2	9	11	2	2	9	1	7	0	0	0	4	0	0	0	0	0	0	0	0	58	0.7%
19 - Broward/ 2nd Ave	13	8	2	34	6	14	16	30	2	22	16	5	0	5	0	0	4	0	0	1	2	17	199	2.3%
20 - Broward/ 5th Ave	3	6	2	20	8	7	3	18	3	11	17	7	0	3	0	2	12	0	4	0	4	3	133	1.5%
21 - Broward/ 15th Ave	1	1	1	5	2	1	1	7	3	13	15	5	0	35	0	2	14	9	23	6	0	4	147	1.7%
22 - Broward Tri-Rail St	3	4	1	16	15	5	3	17	17	34	136	46	0	227	0	28	149	106	213	62	43	0	1,124	13.0%
Total	480	410	134	1,291	407	613	223	592	255	486	871	197	308	915	353	35	184	115	414	166	82	109	8,638	100.0%
	5.6%	4.8%	1.5%	14.9%	4.7%	7.1%	2.6%	6.8%	2.9%	5.6%	10.1%	2.3%	3.6%	10.6%	4.1%	0.4%	2.1%	1.3%	4.8%	1.9%	0.9%	1.3%	100%	
	WB/SB Stations										EB/NB Stations													

Direction	Trips	%
Eastbound	4,583	53.1%
Westbound	4,045	46.9%
Total	8,628	100.0%

Access Type	Trips	%
Walk	5,811	67.3%
PnR	1,904	22.0%
KnR	923	10.7%
Total	8,638	100.0%

Time Period	Trips	%
Peak	5,340	61.9%
Off-Peak	3,288	38.1%
Total	8,628	100.0%

Intermodal Trips on Light Rail				
Mode Used/Access Type	Walk	PnR	KnR	Total
Light Rail & Tri-Rail	259	298	191	748
Light Rail & Sawgrass Rapid Bus	223	10	12	245
Light Rail & All BCT Rapid Buses	223	10	12	245
Light Rail & WAVE	66	0	3	69

*Trip could have involved more than the two modes mentioned above

Trips By Segment	Boardings		Attractions	
	#	%	#	%
University/Nova - Tri-Rail FLL/I-95	4,020	46.5%	3,557	41.2%
Tri-Rail FLL/I-95 - Broward Tri-Rail St	4,618	53.5%	5,081	58.8%
Total	8,638	100.0%	8,638	100.0%

Appendix E: Boardings by Transit Route

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Central Broward Transit - Daily Boardings by Transit Route

	Model Route No.	Route Name	2010 Observed	2035 No Build	2035 TSM	Broward Boulevard/S R 7 Alternative	Griffin Road Modern Streetcar Alternative	Griffin Road Premium Bus Alternative	Griffin Road Modern Streetcar 2010 Network	Griffin Road Modern Streetcar One-Way Loop 2010 Network	Griffin Road Modern Streetcar 2010 Build	Griffin Road Modern Streetcar 2016 Build
Land Use Data Transit/Highway Network			2035 2035	2035 2035	2035 2035	2035 2035	2035 2035	2035 2035	2035 2010	2035 2010	2010 2010	2016 2016
Project	M35L1	Guideway Project	-	-	-	3,768	10,380	4,460	12,008	9,318	8,421	8,628
	M34L96/97	Sawgrass Rapid Bus	-	-	4,428	4,953	917	3,430	1,139	901	897	833
	Guideway Project Subtotal		-	-	4,428	8,721	11,297	7,890	13,147	10,219	9,318	9,461
	M32L1	Wave	-	302	381	70	79	64	158	76	101	131
East-West Routes	M33L72	Oakland Park Boulevard Local Bus	7,593	6,411	6,380	6,327	6,301	6,353	7,673	6,316	5,911	7,042
	M34L95	Oakland Park Boulevard/Andrews Rapid Bus	-	4,222	4,210	4,136	4,175	4,225	-	4,182	-	-
	M34L72	Oakland Park Boulevard Rapid Bus EW	-	3,582	3,595	3,601	3,638	3,644	-	3,629	-	-
	Oakland Park Boulevard Subtotal		-	14,215	14,185	14,064	14,114	14,222	7,673	14,127	5,911	7,042
	M33L36	Sunrise Boulevard Local Bus	7,176	6,823	6,626	6,594	6,451	6,483	5,879	6,466	4,794	4,846
	M34L75	Sunrise Boulevard Rapid Bus	-	4,621	4,422	4,358	4,359	4,580	-	4,359	-	-
	Sunrise Boulevard Subtotal		7,176	11,444	11,048	10,952	10,810	11,063	5,879	10,825	4,794	4,846
	M33L22	Broward Boulevard Local Bus	4,216	2,660	2,560	2,085	2,144	2,127	2,769	2,152	1,923	3,884
	M34L92	Broward Boulevard Rapid Bus - SR 7 to BCT Central Terminal	-	4,799	3,998	3,905	3,400	3,690	-	3,410	-	-
	M34L90	Broward Boulevard Rapid Bus - BCT Central Terminal to West Regional Terminal	-	1,851	1,813	1,447	1,586	1,744	-	1,599	-	-
	Broward Boulevard Subtotal		-	9,310	8,371	7,437	7,130	7,561	2,769	7,161	1,923	3,884
	M33L207	Griffin Road Local Bus	-	2,580	405	2,431	278	289	-	311	-	-
	M33L30	Peters Road Local Bus	2,234	4,226	3,867	3,707	3,535	3,831	1,811	3,535	1,572	2,348
	M33L154	I-595 Pilot Express - Weston P&R to Broward Medical Center	-	428	393	239	222	256	-	222	-	130
	M33L155	I-595 Pilot Express - BB&T (Bank Atlantic) Center to Broward Medical Center	-	293	271	147	126	146	-	132	-	108
M33L156	I-595 Pilot Express - Weston P&R to Downtown Miami	-	1,977	2,664	2,812	2,858	2,857	-	2,790	-	1,102	
M33L157	I-595 Pilot Express - BB&T (Bank Atlantic) Center to Downtown Miami	-	2,066	2,698	2,933	2,981	2,959	-	2,920	-	1,055	
North-South Routes	M33L201	Flamingo Road Local Bus	-	1,669	1,651	1,621	1,616	1,620	-	1,604	-	-
	M33L202	Nob Hill Road Local Bus	-	1,573	1,507	1,530	1,505	1,512	-	1,496	-	-
	M33L203	Pine Island Road Local Bus	-	1,791	1,716	1,719	1,658	1,677	-	1,658	-	-
	M33L2	University Drive Local Bus	6,338	8,154	8,529	8,622	8,704	8,612	10,160	8,553	7,424	6,869
	M34L291	University Drive Rapid Bus	903	16,818	16,587	16,956	17,382	18,057	2,801	17,357	2,183	4,896
	M33L9	Davie to Downtown Local Bus	2,046	5,342	5,144	4,125	4,230	4,374	2,138	4,650	1,795	1,716
	M33L18	SR 7 Local Bus	14,639	11,911	11,975	11,846	11,803	11,792	17,413	11,816	12,911	12,723
	M34L441	SR 7 Rapid Bus	1,918	28,697	28,529	28,156	28,519	27,992	974	28,374	842	2,496
	M33L1	US 1 Local Bus	7,228	7,265	7,444	6,874	6,997	7,153	8,451	7,065	6,749	5,014
	M34L191	US 1 Rapid Bus	919	11,898	11,709	11,752	11,670	11,745	1,079	11,614	993	2,567
Regional Routes	M15L1	Tri-Rail	12,200	16,200	16,083	15,915	15,873	15,899	19,731	15,873	13,079	13,078
	M14L1	Metrorail Existing	57,884	152,330	152,327	152,418	152,418	152,419	266,096	152,369	57,526	47,575
	M14L13	Metrorail Extension	-	125,787	125,834	125,978	125,961	125,963	-	125,894	-	46,311