

Tri-Rail Coastal Link Study

(formerly known as the South Florida East Coast Corridor Study)

Tri-Rail Coastal Link

Getting Southeast Florida To Work



Broward Metropolitan Planning Organization
Florida Department of Transportation
Miami-Dade Metropolitan Planning Organization
Palm Beach Metropolitan Planning Organization
Southeast Florida Transportation Council
South Florida Regional Planning Council
South Florida Regional Transportation Authority
Treasure Coast Regional Planning Council

Preliminary Project Development Report

April 2014

Appendix 2: Travel Demand Forecasting and Report Materials

FINAL

FM No. 41703132201



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Appendix 2A: SERPM 6.7 Transit Model Calibration Technical Memorandum

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SERPM 6.7 Transit Model – Calibration Technical Memo

1.0 Introduction

This document summarizes the transit travel markets in the South Florida region and the calibration/validation results from the travel demand model used for developing the Tri-Rail Coastal Link (f/k/a SFECC Study) project forecast during the Preliminary Project Development phase. The demand model is referred to as Southeast Florida Regional Planning Model version 6.7 (SERPM 6.7) and was developed in February 2012 for this study.

There are four sections describing various topics and a technical appendix that contains the supporting tables and figures:

- Section 2 provides a review of the existing transit travel markets,
- Section 3 summarizes the validation of the transit travel markets and patterns,
- Section 4 provides an overview of the model’s sensitivity of Tri-Rail ridership to important transportation variables,
- Section 5 provides a review of the pathbuilding/mode choice structure, and
- The Technical Appendix contains many tables and figures detailing the observed and estimated transit travel characteristics.

2.0 Overview of Existing Travel Markets

The transit travel markets were identified through an analysis of 2008-2010 transit on-board surveys. For SERPM 6.7 calibration and validation to be successful, the transit model must possess an understanding of the two key aspects of transit usage in South Florida:

1. There are two major types of transit markets in the South Florida region: a mobility-dependent

market using local services for all trip-making and a commuter market utilizing premium transit service for longer work trips. The differences between these markets are summarized in Table 2.1.

Table 2.1: Summary of Differences Between Mobility-Dependent and Commuter Markets

Trip Characteristic	Mobility-Dependent Market	Commuter Market
Dominant market segment(s)	Zero-car households	Car-owning households
Travel patterns	Dispersed travel patterns; no meaningful CBD market	Primary destinations are Miami CBD area and suburban employment areas
Primary access modes	90+% Walk	57% Walk (Metrorail); 70+% Auto (I-95EX, Tri-Rail)
Average trip length	~6.5 miles	Ranges from 7.6 miles (Metrorail) to 28.7 miles (Tri-Rail)
Dominant trip purpose(s)	No dominant trip purpose	Work

2. While work trips from car-owning households comprise the commuter market, the market itself consists of three distinct sub-markets:
 - a. A traditional commuter market utilizing *urban rail* to distribute Miami-Dade

- b. A second traditional commuter market utilizing *express bus* service to connect Broward County workers to jobs in and around the Miami CBD; and
- c. A non-traditional inter-county market utilizing *commuter rail* to connect workers

with jobs throughout the 3-county region, with these trips beginning and ending in different counties with no dominant destination.

The differences between these sub-markets are summarized in Table 2.2.

Table 2.2: Summary of Differences Among The Commuter Sub-Markets

Trip Characteristic	<u>Traditional Commuter #1 Miami-Dade County to Miami CBD</u>	<u>Traditional Commuter #2 Broward County to Miami CBD</u>	<u>Non-Traditional Commuter Inter-County Movements</u>
Dominant origin/production	Miami-Dade County	Broward County	No dominant origin/production
Dominant destination/attraction	Miami CBD and surrounding area		No dominant destination/attraction
Primary access mode(s)	57% walk, 43% auto	~75% auto, ~25% walk	
Average trip length	7.6 miles	Ranges from 12-20 miles depending on route	28.7 miles
Primary egress mode(s)	Walk		77% walk, 23% auto

3.0 Summary of Transit Travel Market Validation

This section describes the characteristics of the existing transit travel markets. The text refers to detailed characteristics from the recently conducted travel surveys. When figures are mentioned, the text refers to the survey results while the current model estimates are included within parentheses. Additional figures and tables comparing observed and estimated characteristics can be found in the Appendix. The model results in this section are based on the 2010-B scenario run, where the inter-county 95E service is removed. The 2010-A scenario run is used to generate some of the ridership numbers specific to 95E buses. A comparison of these two scenarios is done in Section 4.0.

3.1 Mobility Dependent Travel Market

The mobility-dependent travel market is one dominated by trips from zero-car households. These trips are extremely dispersed, with no principal origin or destination. Less than 10% of these trips are destined for the West Palm Beach and Ft. Lauderdale CBDs (also true for estimated values). Walk is the dominant access and egress mode, with nearly 97% of Palm Tran riders and 89% of BCT riders accessing their respective systems by walking (91% and 92% estimated, respectively).

The model over-estimates Palm Tran boardings by 14%, generating 38,663 boardings per average weekday versus 33,939 observed boardings. The model appears to over-state the pedestrian-

friendliness of Palm Beach County, especially in lower-density areas near US-1 and Congress Avenue. Even with this over-estimation, the model does generally provide a good representation of the dispersed travel patterns associated with these trips (as shown in Tables B-1 and B-2 in the Appendix). With respect to route-level boardings (shown in Table B-3 in the Appendix) the model over-estimates ridership on routes along US-1 and Congress Avenue as well as routes in the Boca Raton area.

Table 3.1: 2010 Palm Tran Average Weekday Boardings (includes school and university trips)		
Observed	Estimated	Difference
33,939	38,663	+14%

The model is very close in its estimation of BCT boardings, producing 116,494 boarding per average weekday versus 119,624 observed (-3% difference). The model also provides a good representation of the dispersed travel patterns of BCT trips (as shown in Tables B-4 and B-5 in the Appendix). With respect to route-level boardings (shown in Table B-6 in the Appendix) the model provides a good match with observed boardings with no dominant trend of over- or under-estimation.

Table 3.2: 2010 Broward County Transit Average Weekday Boardings (includes school and university trips)		
Observed	Estimated	Difference
119,624	116,494	-3%

3.2. Traditional Commuter Markets

The primary destination of the two traditional commuter markets is downtown Miami and the adjacent areas. Metrorail connects these areas to workers in Central and Southern Miami-Dade County. Miami-Dade Transit's 95X express bus

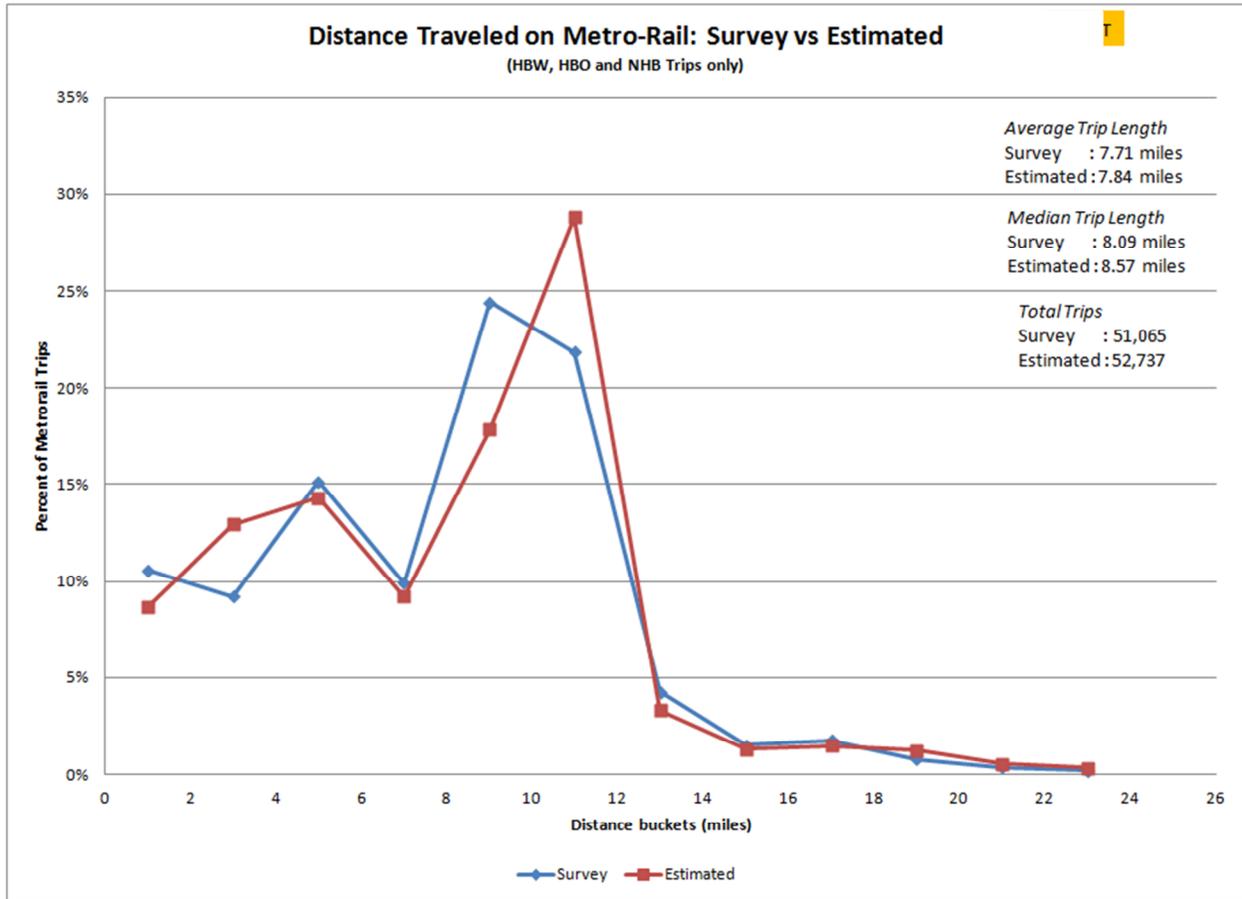
routes connects these areas to workers living in Northern Miami-Dade County, while the I-95 Express (inter-county service operated by both Miami-Dade Transit and Broward County Transit) connects downtown Miami with Broward County via non- or very limited-stop service.

Table 3.3: Work Transit Trips to Miami CBD and Adjacent Areas			
Commuter Transit Mode	Observed	Estimated	Difference
Metrorail	23,335	28,043	+4,708
95X buses	1,592	2,481	+889
95E buses	897	892	-5
Tri-Rail	1,093	799	-294
Total	26,917	32,215	+5,298

The model is over-estimating in its representation of commuter transit modes to downtown Miami and the adjacent areas. The detailed characteristics of each of the commuter transit mode are discussed in the following sections.

Metrorail. Seventy-five percent of Metrorail riders use the system to travel to work (72% estimated). The primary destinations, downtown Miami and the immediately surrounding area, are served by five 'core' Metrorail stations: Civic Center, Culmer, Overtown, Government Center and Brickell. Sixty-five percent of all Metrorail trips are destined to these five stations (62% estimated). Sixty percent of Metrorail riders travel northbound (73% estimated) an average of 7.8 miles (estimated value is 7.8 miles also) to reach these core stations. The following figure shows the Metrorail trip length frequency distribution for Home-Based Work (HBW), Home-Based Non-work (HBNW) and Non-Home Based (NHB) trips is well represented by the model.

Figure 3.1: Distance Traveled on Metro-Rail



Roughly half of Metrorail riders use a combination of rail and bus to reach their destination (44% estimated); the other half only use line-haul rail systems to reach their destination (56% estimated). The primary access mode is walk – 53% of riders (47% estimated) – with park-ride (39% estimated) the secondary access mode. Only 10% of Metrorail riders access the system by drop-off (14% estimated).

A comparison of the observed and estimated station-to-station Metrorail linked trip flows (as shown in Tables M-1 through M-8 in the Appendix) shows that the model is representing overall observed travel patterns well.

The university (HBU) transit trip market is under-estimated.

Purpose	Observed	Estimated	Difference
HBW	35,065	41,477	18%
HBNW	9,866	6,965	-29%
NHB	6,134	4,294	-30%
<i>Sub-total</i>	<i>51,065</i>	<i>52,737</i>	<i>3%</i>
HBU	6,819	4,706	-31%
Total	57,884	57,442	0%

I-95X Service. Almost all of 95X riders are destined for Miami-Dade County (92% estimated). Over 90% of them use only the bus to reach their destination (97% estimated). The model produces a good representation of the concentrated travel patterns to the downtown Miami area (as shown in Tables E-1 and E-2 in the Appendix). The



model also is producing a reasonable representation of route-level average weekday boardings.

95X Service*	Observed	Estimated	Difference
95X – Biscayne Blvd	1,078	2,043	965
95X – Civic Center	471	1,021	550
95X – Brickell	357	296	-61
Total	1,906	3,360	1,454

*Includes school and university trips.

I-95E Service. Eighty-five percent of the 95E riders are destined for Miami-Dade County (60% estimated). The model produces a good representation of the concentrated travel patterns to the downtown Miami area (as shown in Tables E-3 and E-4).

The model produces a reasonable representation of average weekday boardings for the Sheridan Street and Fort Lauderdale routes, but significantly over-estimates the Pine Boulevard route. This route is the only 95E route that provides meaningful walk accessibility and non-downtown Miami destinations at a level of service equal or better than the competitive BCT routes.

95E Service*	Observed	Estimated	Difference
95E – Sheridan St.	377	517	140
95E – Fort Lauderdale	470	853	383
95E – Pines Blvd	218	774	556
Total	1,065	2,144	1,079

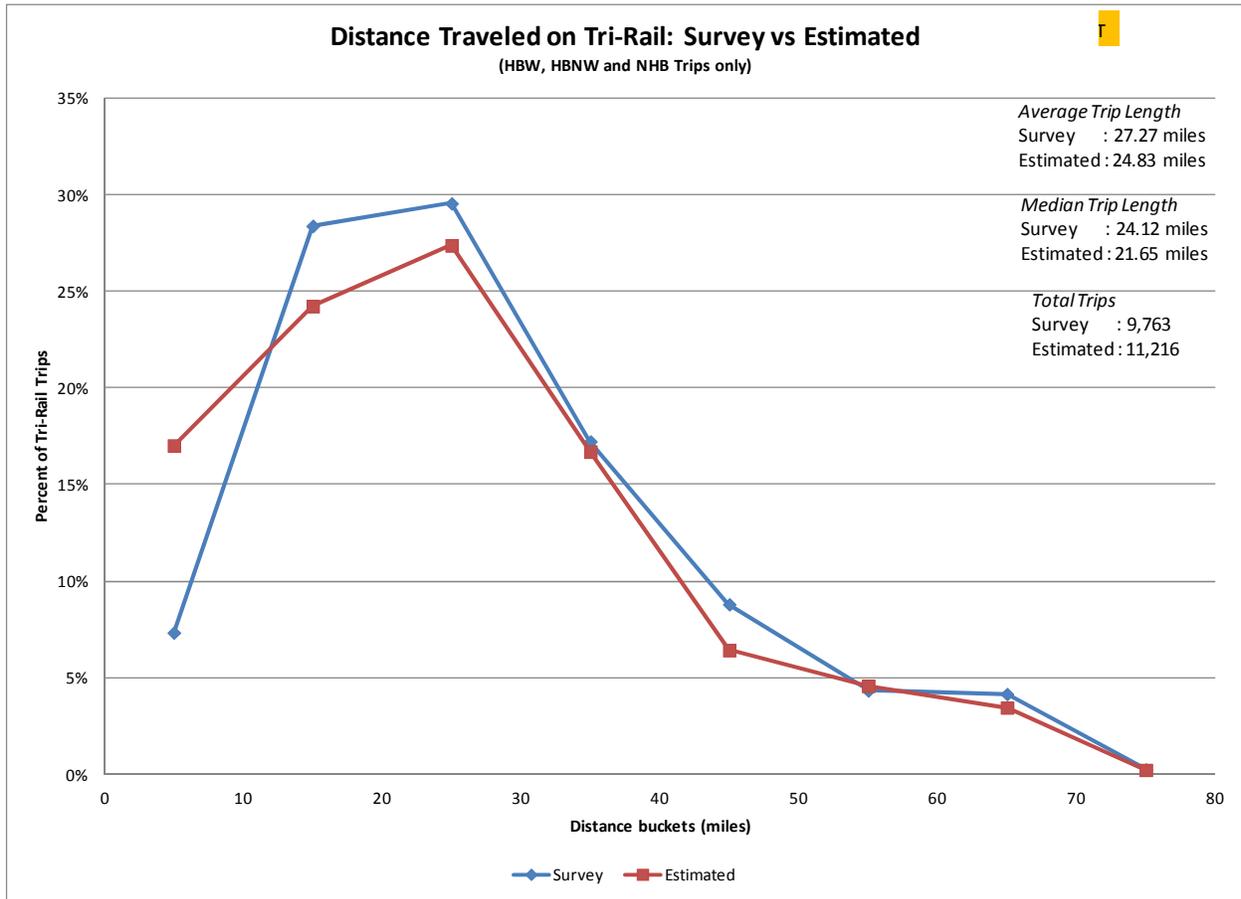
*Includes school and university trips

3.3. Non-Traditional Commuter Markets

The Tri-Rail commuter market is unlike commuter rail markets in the country. It does not connect directly to any activity center (since the track is located generally between an interstate facility and light manufacturing areas throughout its 72-mile length). Due to this unique commuter rail alignment, about 75% of Tri-Rail riders (65% estimated) access and egress the service through non-walk modes, using auto and bus service to connect.

Since it is the only transit service in the region that provides a direct connection to all three counties, Tri-Rail is primarily used for long, inter-county trips, with 78% of all trips traveling between at least two of the three counties (73% estimated). Riders use the system for an average of 27.3 miles (25 miles estimated) and a median of 24.1 miles (21.7 miles estimated). Ninety-one percent of riders travel through three or more stations (81% estimated). The model has a good understanding of the long trip-making of Tri-Rail riders, as shown in the following chart.

Figure 3.2: Distance Traveled on Tri-Rail



Tri-Rail riders do not generally interface with the bus systems. About 76% of riders use the Tri-Rail shuttles and/or Metrorail (78% estimated). The remaining 24% use a combination of Tri-Rail and buses (22% estimated). The breakdown of modes used in conjunction with Tri-Rail is shown in Table 3.7. It shows the model has a strong understanding of how Tri-Rail riders use transferring modes.



Table 3.7: Modes Used in Tri-Rail Path

Mode	Observed	Estimated
Tri-Rail only	3,747	4,764
Tri-Rail shuttle	1,908	2,931
Metrorail	1,808	1,873
Palm Tran	931	616
BCT	759	1,101
MDT Metrobus	696	1,107
I-95X	-	231
<i>Rail- or shuttle only</i>	<i>7,463</i>	<i>8,695</i>
<i>Rail/Bus</i>	<i>2,300</i>	<i>2,521</i>
Total	9,763	11,216
<i>% Rail- or shuttle only</i>	<i>76%</i>	<i>78%</i>
<i>% Rail/Bus</i>	<i>24%</i>	<i>22%</i>

Tri-Rail travel patterns are very dispersed, with no station producing or attracting more than 18% of total ridership. The dominant attraction station is the Metrorail Transfer Station, which attracts 18% of riders (12% estimated). Tri-Rail's travel patterns are generally balanced – relative to typical commuter rail systems – with a southward orientation. About 58% of trips travel southbound (55% estimated). A comparison of the observed and estimated station-to-station Tri-Rail linked trip flows (as shown in Tables T-1 through T-8 in the Appendix) shows that it is reflecting park-ride observed travel patterns well with some discrepancies for walk- and drop-off-access trips.

Most riders access Tri-Rail by park-ride (55% observed vs. 46% estimated), with Miami-Dade as their predominant destination. The remaining riders are split between walking (26% observed vs. 31% estimated) and drop-off (20% observed vs. 23% estimated). The market sheds for auto-access trips to Tri-Rail appear to be too tightly concentrated around those stations. The observed data shows that riders drive longer distances to ride the rail systems

Work trips comprise 85% of all Tri-Rail trips (65% estimated). Work productions and attractions are also dispersed fairly evenly throughout each

county, although Broward County has the most number of productions and attractions. The most prevalent work travel pattern is Broward County to Miami-Dade County, which represents 23% of all work trips (17% estimated). A comparison of these flows (as shown in Tables T-9 through T-14 in the Appendix) shows that the model is generally reflecting the work travel patterns well.

Table 3.8: 2010 Tri-Rail Average Weekday Boardings

Purpose	Observed	Estimated	Difference
HBW	8,341	7,265	-1,076
HBNW	1,054	2,928	1,874
NHB	368	1,023	756
<i>Sub-total</i>	<i>9,763</i>	<i>11,216</i>	<i>1,454</i>
HBU	1,268	770	-498
HBSch	1,169	996	-173
<i>Total</i>	<i>12,200</i>	<i>12,982</i>	<i>782</i>

4.0 Overview of Sensitivity Analysis Results

There are eight validation scenarios being reviewed as part of the SERPM 6.7 validation process to analyze the model's sensitivity of Tri-Rail boardings to key transportation variables:

- Introduction of 95E inter-county bus service,
- Higher fuel prices,
- Tri-Rail and Tri-Rail shuttle service changes,
- Future year historical socio-economic growth trends and
- Planned transportation improvements in the region.

The eight scenarios are described in Table 4.1. The 2010-B scenario was used for mode choice calibration; its results are shown in other sections of this document. This scenario was specially used for calibration to replicate only those inter-county express bus services available at the time the Tri-Rail survey was conducted in 2008.

Table 4.1: List of All Scenarios Modeled

#	Name	Description
1	2010 "A"	Includes all transit modes in operation in 2010
2	2010 "B" **	"A" with I-95E service removed (to correspond with inter-county service available at the time of the Tri-Rail survey)
3	2010 "C"	"B" using an increased auto operating cost to resemble the higher gas prices during the 2008 Tri-Rail survey (AOC is \$0.115 instead of \$0.095)
4	2010 "D"	"B" using an increased auto operating cost to resemble the highest gas prices observed in 2008 (AOC is \$0.145 instead of \$0.095)
5	2010 "E"	"B" with a hypothetical increase in Tri-Rail service to 20/60 pk/op headways (from 30/60 pk/op)
6	2005	All transit service, including Tri-Rail mainline and shuttle service, reflects 2005 conditions
7	2035 No-Build	Future year ZDATA with 2010 highway and transit networks
8	2035 LRTP	Future year ZDATA with adopted long-range plans

** This scenario is used for mode choice calibration

Introduction of 95E Inter-County Express Buses on Tri-Rail Ridership. The primary purpose of the 2010-A scenario is to evaluate the ridership impacts on Tri-Rail when the I-95E inter-county express buses are introduced. These buses operate between Broward County and Miami-Dade County along I-95, including the 95 Express lanes in Miami-Dade County, providing a quicker connection to downtown Miami than Tri-Rail. The 2010-A results show a decrease of 603 Tri-Rail riders when the I-95E buses are included. The I-95E surveys showed that 434 people responded that they previously used 'other transit' before switching to I-95E.

Higher Fuel Prices. The purpose of the 2010-C scenario is to evaluate the Tri-Rail ridership impacts due to changes in fuel prices. For these tests, the auto operating cost was increased by 23% to reflect the difference in gas prices between

June 2010 (a \$2.72 monthly average for Miami according to www.gasbuddy.com) and March 2008 (a \$3.34 monthly average), and by 53% to reflect the highest gas prices experienced to date (June 2008). The estimated elasticity of Tri-Rail boardings to gas prices is +0.17-0.21, which is consistent with other research. The observed elasticity is +0.43-0.48, but it should be mentioned that there are large macroeconomic differences between March 2008, the height of the most recent economic cycle, and June 2010, near the low point of the current economic downturn. In fact, the unemployment rate in Miami-Dade County more than doubled between Q1 2008 and Q1 2010 (5.1% to 11.4%). The estimated elasticity to gas prices for all other transit modes ranges between +0.07 and +0.10.



Table 4.2: Impact of Gas Prices on Tri-Rail Boardings

Gas Price Scenario	Tri-Rail Boardings		Auto Operating Cost (cents/mi)	Gas Price Elasticity	
	Observed	Estimated		Observed	Estimated
'Existing' (June 2010)	12,200	13,000	9.5	--	--
'Higher Fuel Price' (March 2008)	13,700	13,500	11.5	+0.48	+0.17
'Highest Fuel Price' (June 2008)	15,000	14,400	14.5	+0.43	+0.21

Notes: Observed values taken from APTA quarter ridership reports.

Estimated boardings do not reflect improved representation of home-based school/ university trips.

Tri-Rail and Tri-Rail Shuttle Service Changes.

The 2005 networks are currently being translated to the mode definitions and other parameters. The differences in weekday Tri-Rail rail and shuttle service are shown in Table 4.3.

Table 4.3: Impact of Service Changes on Tri-Rail Boardings

	2005	2010-B	2010-E
Tri-Rail			
Route-Miles	2,495	3,715	4,183
Vehicle-Hours	61	101	114
Boardings	9,463	13,001	14,274
Tri-Rail Shuttles			
Route-Miles	963	3,599	4,058
Vehicle-Hours	91	268	309
Boardings	458	3,795	4,516

The model's elasticity to Tri-Rail ridership is +0.57, which is very close to the observed elasticity of +0.61 based on the 2005 and 2010-B conditions.

Future Year Socio-Economic Growth Trends. The 2035 No Build scenario, which reflects historical trends in population and employment growth, are showing strong increases in Tri-Rail ridership, from 13,001 to 24,239 (86%). Part of this increase is due to a sharp increase in congestion throughout lower Miami-Dade County. Ongoing coordination with the MPO will occur in Project Development to validate the future socioeconomic conditions.

Planned Transportation Improvements. The 2035 LRTP scenario reflects the historical trends in

population and employment growth and the regionally-adopted transportation plans. The planned improvements include:

1. Increases in Tri-Rail mainline and shuttle service. Mainline Tri-Rail service is expected to increase to 20/60 pk/op headways from 30/60 pk/op headways (i.e., 60 trains/day from 50 trains/day);
2. Extension of HOT/managed lanes on I-95 from Golden Glades to Yamato Road in Palm Beach County. HOT/managed lanes would cover the entire stretch of I-95 in both Miami-Dade and Broward Counties;
3. Introduction of rapid bus service in several corridors;
4. Introduction of Bus Rapid Transit (BRT) service on several key corridors in Broward and Miami-Dade County. These services operate in exclusive right-of-way. Two of these services, the SR7/US441 BRT and US-1 BRT, would directly compete with Tri-Rail; and
5. Strong increases in local bus service.

The result of these improvements is a 39% decrease in Tri-Rail boardings from the 2035 No build scenario (17,399 from 24,239). This decrease is largely due to the increased competition from the BRT services. Regionally, transit boardings increase 14% while transit linked trips increase 12.6%.

The summary results of all seven scenarios are shown in the following two tables.



Table 4.4A and B: Boarding Summary

Operator No.	Operator Name	Observed Ridership (2010)	Estimated Daily Boardings								Daily Vehicle Route-Miles (Transit)							Daily Vehicle Service-Hours (Transit)									
			2010 Base B	2010 Base E	2010 Base A	2010 Base C	2010 Base D	2005 Base	2035 NB	2035 L RTP	2010 Base B	2010 Base E	2010 Base A	2010 Base C	2010 Base D	2005 Base	2035 NB	2035 L RTP	2010 Base B	2010 Base E	2010 Base A	2010 Base C	2010 Base D	2005 Base	2035 NB	2035 L RTP	
11	Tri-Rail	12,200	13,001	14,274	12,398	13,506	14,395	9,463	24,239	17,399	3,715	4,183	3,715	3,715	3,715	2,495	3,715	4,188	101	114	101	101	101	61	101	113	
12	Tri-Rail Shuttle	1,636	3,795	4,516	3,688	3,928	4,162	458	6,327	3,734	3,599	4,058	3,599	3,599	3,599	963	3,599	5,763	268	309	268	267	266	91	287	454	
25	Metrorail	57,884	57,468	57,919	57,315	58,754	59,726	62,633	254,257	276,975	3,770	3,770	3,770	3,770	3,770	4,704	3,770	7,541	137	137	137	137	137	157	137	267	
21	MDT Local Bus	189,726	196,124	195,083	196,195	199,453	204,008	207,202	420,399	442,141	67,577	67,600	67,577	67,577	67,577	83,632	67,577	86,857	5,316	5,315	5,316	5,309	5,298	6,504	6,003	7,600	
22	MDT Express	1,970	4,540	4,664	4,549	4,833	4,599	1,167	18,484	24,981	2,021	2,021	2,021	2,021	2,021	949	2,021	2,410	127	126	127	125	128	43	229	242	
24	MDT 95X	2,792	3,703	3,691	3,360	3,754	3,937	2,275	7,123	8,947	1,523	1,523	2,212	1,523	1,523	2,064	1,523	2,119	69	69	82	69	68	117	80	105	
24	MDT 95E	-	-	-	1,370	-	-	-	-	4,327	-	-	1,358	-	-	-	-	1,669	-	-	39	-	-	-	-	70	
27	KAT/MAX	24,906	28,299	28,569	28,190	29,765	30,974	28,319	236,581	215,807	10,380	10,416	10,380	10,380	10,380	10,687	10,380	10,767	609	609	609	604	602	590	713	687	
26	Metromover	28,546	8,809	8,930	8,920	9,117	9,362	9,053	23,920	21,329	3,829	3,829	3,829	3,829	3,829	3,829	3,829	4,249	319	319	319	319	319	319	319	358	
31	BCT Local/Community Bus	123,806	119,040	117,702	119,107	121,041	124,204	127,307	155,790	197,831	48,612	48,512	48,612	48,612	48,612	53,700	48,612	97,365	3,224	3,207	3,226	3,222	3,219	3,625	3,311	6,319	
32	BCT Breeze	3,740	4,205	4,159	3,918	4,346	4,551	3,696	7,005	-	1,747	1,746	1,747	1,747	1,747	2,317	1,747	-	88	88	88	88	88	117	95	-	
33	BCT Express	-	-	-	-	-	-	721	-	400	-	-	-	-	-	568	-	73	-	-	-	-	-	30	-	-41	
33	BCT 95E	197	-	-	774	-	-	-	-	646	-	-	608	-	-	-	-	1,598	-	-	19	-	-	-	-	106	
34	BCT Rapid Bus	-	-	-	-	-	-	-	-	36,927	-	-	-	-	-	-	-	19,298	-	-	-	-	-	-	-	816	
35	BCT BRT/LRT	-	-	-	-	-	-	-	-	58,130	-	-	-	-	-	-	-	27,244	-	-	-	-	-	-	-	1,132	
41	Palm Tran Local	33,924	38,173	38,553	38,185	38,810	39,890	34,606	53,950	67,920	22,924	23,301	22,924	22,924	22,924	20,822	22,924	38,152	1,329	1,352	1,329	1,329	1,328	1,119	1,367	2,046	
42	Palm Tran Express	15	53	53	53	54	59	-	62	-	239	239	239	239	239	-	239	-	6	6	6	6	6	-	6	-	
MDT Total		219,394	232,666	232,007	233,664	237,805	243,518	238,963	682,587	696,203	81,501	81,560	83,548	81,501	81,501	97,333	81,501	103,822	6,122	6,118	6,174	6,107	6,096	7,254	7,026	8,704	
BCT Total		127,742	123,245	121,861	123,799	125,387	128,755	131,724	162,795	293,934	50,359	50,258	50,967	50,359	50,359	56,585	50,359	145,578	3,312	3,296	3,334	3,310	3,307	3,772	3,407	8,332	
Palm Tran Total		33,939	38,226	38,606	38,238	38,864	39,949	34,606	54,012	67,920	23,163	23,540	23,163	23,163	23,163	20,822	23,163	38,152	1,335	1,358	1,335	1,334	1,334	1,119	1,374	2,046	
Regional Total		481,341	477,210	478,113	478,022	487,361	499,867	486,900	1,208,137	1,377,494	169,935	171,198	172,590	169,935	169,935	186,731	169,935	309,292	11,594	11,652	11,668	11,576	11,561	12,773	12,650	20,274	
*assumed 5.5 hours of peak period service and 10 hours of off-peak service																											
*observed data based on survey conducted by transit agencies																											
*2005 Observed Boardings data from SERPM 6.5 Documentation																											
% Change																											
Operator No.	Operator Name	Observed Ridership (2010)	2010 Base B	2010 Base E	2010 Base A	2010 Base C	2010 Base D	2005 Base	2035 NB	2035 EC	2010 Base B	2010 Base E	2010 Base A	2010 Base C	2010 Base D	2005 Base	2035 NB	2035 EC	2010 Base B	2010 Base E	2010 Base A	2010 Base C	2010 Base D	2005 Base	2035 NB	2035 EC	
11	Tri-Rail	-	-	9.8%	-4.6%	3.9%	10.7%	-27.2%	86.4%	33.8%	-	12.6%	0.0%	0.0%	0.0%	-32.9%	0.0%	12.7%	-	12.6%	0.0%	0.0%	0.0%	-39.7%	0.0%	12.1%	
12	Tri-Rail Shuttle	-	-	19.0%	-2.8%	3.5%	9.7%	-87.9%	66.7%	-1.6%	-	12.8%	0.0%	0.0%	0.0%	-73.2%	0.0%	60.1%	-	15.6%	0.0%	-0.2%	-0.4%	-66.1%	7.2%	69.6%	
25	Metrorail	-	-	0.8%	-0.3%	2.2%	3.9%	9.0%	342.4%	382.0%	-	0.0%	0.0%	0.0%	0.0%	24.8%	0.0%	100.0%	-	0.0%	0.0%	0.0%	0.0%	14.2%	0.0%	94.3%	
21	MDT Local Bus	-	-	-0.5%	0.0%	1.7%	4.0%	5.6%	114.4%	125.4%	-	0.0%	0.0%	0.0%	0.0%	23.8%	0.0%	28.5%	-	0.0%	0.0%	-0.1%	-0.3%	22.3%	12.9%	43.0%	
22	MDT Express	-	-	2.7%	0.2%	6.5%	1.3%	-74.3%	307.1%	450.2%	-	0.0%	0.0%	0.0%	0.0%	-53.0%	0.0%	19.2%	-	-1.2%	0.0%	-1.8%	0.8%	-66.0%	80.1%	90.3%	
24	MDT 95X	-	-	-0.3%	-9.3%	1.4%	6.3%	-38.6%	92.4%	141.6%	-	0.0%	45.3%	0.0%	0.0%	35.6%	0.0%	39.2%	-	0.4%	19.3%	-0.3%	-0.8%	69.7%	16.5%	52.2%	
24	MDT 95E	-	-	-	NAN	-	-	-	-	NAN	-	-	NAN	-	-	-	-	NAN	-	-	NAN	-	-	-	-	NAN	
27	KAT/MAX	-	-	1.0%	-0.4%	5.2%	9.5%	0.1%	736.0%	662.6%	-	0.3%	0.0%	0.0%	0.0%	3.0%	0.0%	3.7%	-	-0.1%	0.0%	-0.9%	-1.3%	-3.2%	17.1%	12.7%	
26	Metromover	-	-	1.4%	1.3%	3.5%	6.3%	2.8%	171.5%	142.1%	-	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.0%	-	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.3%	
31	BCT Local/Community Bus	-	-	-1.1%	0.1%	1.7%	4.3%	6.9%	30.9%	66.2%	-	-0.2%	0.0%	0.0%	0.0%	10.5%	0.0%	100.3%	-	-0.5%	0.1%	-0.1%	-0.1%	12.5%	2.7%	96.0%	
32	BCT Breeze	-	-	-1.1%	-6.8%	3.4%	8.2%	-12.1%	66.6%	-	-	0.0%	0.0%	0.0%	0.0%	32.6%	0.0%	-	-	-0.2%	0.0%	-0.2%	-0.4%	31.9%	7.7%	-	
33	BCT Express	-	-	-	-	-	-	NAN	-	NAN	-	-	-	-	-	NAN	-	NAN	-	-	-	-	-	NAN	-	NAN	
33	BCT 95E	-	-	-	NAN	-	-	-	-	NAN	-	-	NAN	-	-	-	-	NAN	-	-	NAN	-	-	-	-	NAN	
34	BCT Rapid Bus	-	-	-	-	-	-	-	-	NAN	-	-	-	-	-	-	-	NAN	-	-	-	-	-	-	-	NAN	
35	BCT BRT/LRT	-	-	-	-	-	-	-	-	NAN	-	-	-	-	-	-	-	NAN	-	-	-	-	-	-	-	NAN	
41	Palm Tran Local	-	-	1.0%	0.0%	1.7%	4.5%	-9.3%	41.3%	77.9%	-	1.6%	0.0%	0.0%	0.0%	-9.2%	0.0%	66.4%	-	1.8%	0.0%	0.0%	-0.1%	-15.8%	2.9%	53.9%	
42	Palm Tran Express	-	-	0.0%	0.0%	1.9%	11.3%	-	17.0%	-	-	0.0%	0.0%	0.0%	0.0%	-	0.0%	-	-	0.0%	0.0%	-0.2%	-0.3%	-	12.5%	-	
MDT Total		-	-	-0.3%	0.4%	2.2%	4.7%	2.7%	193.4%	199.2%	-	0.1%	2.5%	0.0%	0.0%	19.4%	0.0%	27.4%	-	-0.1%	0.8%	-0.3%	-0.4%	18.5%	14.8%	42.2%	
BCT Total		-	-	-1.1%	0.4%	1.7%	4.5%	6.9%	32.1%	138.5%	-	-0.2%	1.2%	0.0%	0.0%	12.4%	0.0%	189.1%	-	-0.5%	0.7%	-0.1%	-0.1%	13.9%	2.9%	151.6%	
Palm Tran Total		-	-	1.0%	0.0%	1.7%	4.5%	-9.5%	41.3%	77.7%	-	1.6%	0.0%	0.0%	0.0%	-10.1%	0.0%	64.7%	-	1.8%	0.0%	0.0%	-0.1%	-16.2%	2.9%	53.2%	
Regional Total		-	-	0.2%	0.2%	2.1%	4.7%	2.0%	153.2%	188.7%	-	0.7%	1.6%	0.0%	0.0%	9.9%	0.0%	82.0%	-	0.5%	0.6%	-0.2%	-0.3%	10.2%	9.1%	74.9%	
*percentage change estimated relative to 2010 Base B output results																											
*NAN - not a number																											

5.0 Review of Pathbuilding/ Mode Choice Structure

New pathbuilding and mode choice structures were developed for the SERPM 6.7 transit model. The new structure consists of the three access modes (walk, park-ride, drop-off) and three line-haul/egress paths: premium-only (walk-egress), premium-only (auto-egress), local/mixed-mode (walk-egress). This structure has a total of nine (3 x 3) paths.

For the SERPM 6.7 transit model, ‘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, 95 Express bus service (which operates on the I-95 managed lanes) and MDT’s 95X express bus (which also operates on the I-95 managed lanes). All other services are considered ‘local’; these include the general bus services provided by Palm Tran, Broward County Transit and Miami-Dade Transit

5.1. Pathbuilder Component Weights

Table 5.1 describes the pathbuilding components and their respective values.

Component	Value
In-vehicle time	1.00x for all bus modes and Metromover 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-ride and kiss-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
Walk-access	5.0/transfer
Park-ride access	20.0/transfer
Drop-off access	10.0/transfer
Transit fare	Appropriate boarding and transfer fare applied at \$8.13 value-of-time

5.2. Mode Choice Model

The SERPM 6.7 mode choice model utilizes an 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

- Households where the number of workers or people are equal to or less than then number of autos available to the household.

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

5.3 Mode Choice Coefficients and Constants

A new set of mode choice coefficients is being used for SERPM 6.7. The level-of-service (LOS) coefficients reflect the values (relative to the in-vehicle time coefficient) used during the transit pathbuilding tests. The value-of-time (VOT) coefficients have been updated to reflect more recent estimates of average wage rates. The new nesting coefficients generally reflect the same values as found in the existing transit model, the nesting structure of the model is shown in Figure 5.1. The new set of coefficients is detailed in Table 5.2.

Figure 5.1: SERPM 6.7 Transit Nesting Structure

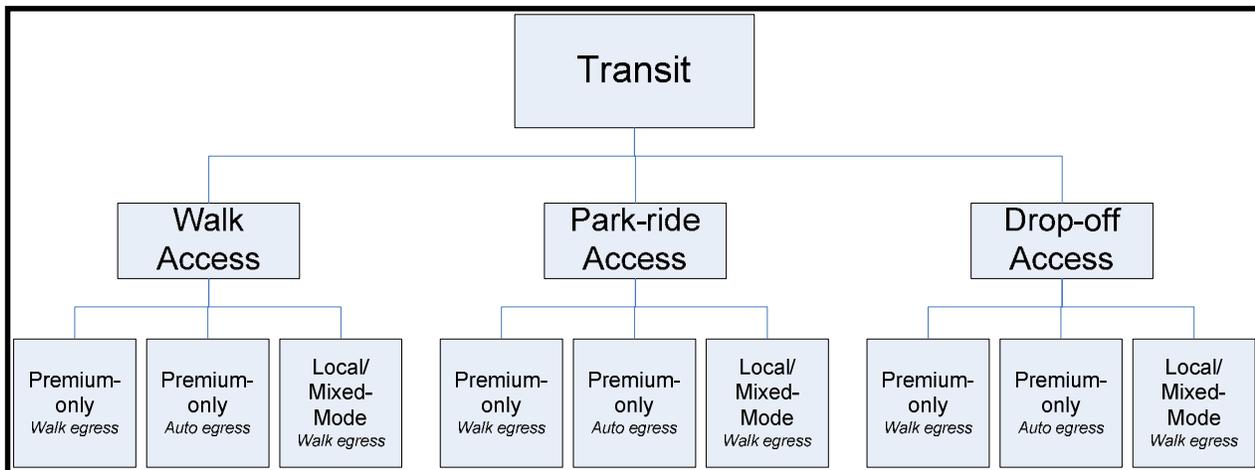


Table 5.2: SERPM 6.7 Mode Choice Coefficients

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 transit path building process but used in mode choice utility calculations						
Mode Choice Coefficients						
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						

Table 5.3 shows the current market segment constants, which reflect the descending level of transit usage by each market segment (i.e., auto availability categories 1, 2 and 3). These constants are applied to all sub-mode utilities.

Trip Purpose	AAMS 1	AAMS 2	AAMS 3
HBW	+1.90	0.00	-2.80
HBNW	+2.20	-1.40	
NHB	0.00		

The current calibration results for Palm Tran and BCT, the two local bus services where survey data is available, show that these constants provide a good reflection of the mobility-dependent market in terms of market segment, access mode and district-to-district movements.

From a modeling perspective, the traditional commuter market, as reflected in the premium/walk and premium/auto paths, process builds upon the above market segment constants in the following ways. The initial results, from using the market segments coefficients only, showed a more significant amount of auto-egress trips than the travel surveys indicated. After several attempts at increasing the weight of those

trips – to reflect the pre-planning that must be performed for those trips to occur – it was decided to decrease the auto-egress market segment constants by 1.0 util for HBW and NHB trips and 0.6 util for HBNW trips (40 minutes of equivalent In-Vehicle Travel Time (IVTT) for HBW, HBNW and NHB trips).

Even with this adjustment, the number of zero-car auto-egress trips was still high for HBW and HBNW trips. It was decided to further decrease the auto-egress market segment constants only for this AAMS category by 1.0 util (40 minutes of equivalent IVTT for HBW trips, 66.7 minutes of equivalent IVTT for HBNW trips). The latest results show that the magnitude of auto-egress trips is now more consistent with observed values.

The model also generated a very high number of zero-car PNR-access trips. To address this issue, it was decided to reduce the market segment constants for PNR access and only for this AAMS category by 2.0 utils (80 minutes of equivalent IVTT for HBW trips, 133.4 minutes of equivalent IVTT for HBNW trips).

Table 5.4 shows the final market segment constants used in the model. These constants reflect the combination of the initial market segment constants and the adjustments mentioned above.

Table 5.4: Combined Market Segment Constants

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	-	1.10	1.40	1.90	1.90	(0.10)	-	-	(2.00)	1.80	1.80	(0.20)
	Cars < Workers HHs	-	-	-	-	-	(1.00)	(0.10)	(0.10)	(2.10)	0.40	0.40	(0.60)
	Cars >= Workers HHs	-	(0.03)	(0.10)	(2.80)	(2.80)	(3.80)	(1.90)	(1.90)	(2.90)	(2.00)	(2.00)	(3.00)
HBO PK	0 Car HHs	-	0.30	0.30	2.20	2.20	0.60	0.70	0.70	(0.90)	2.70	2.70	1.10
	Cars < Workers HHs	-	0.02	0.01	(1.40)	(1.40)	(2.00)	(1.40)	(1.40)	(2.00)	(0.70)	(0.70)	(1.30)
	Cars >= Workers HHs	-	0.02	0.01	(1.40)	(1.40)	(2.00)	(1.40)	(1.40)	(2.00)	(0.70)	(0.70)	(1.30)
NHB PK	All HHs	-	-	-	-	-	(1.00)	-	-	(1.00)	-	-	(1.00)
HBU PK	All HHs	-	-	-	(1.00)	(1.00)	(1.60)	(1.00)	(1.00)	(1.60)	(1.00)	(1.00)	(1.60)
HBW OP	0 Car HHs	-	1.00	1.40	2.00	2.00	-	0.30	0.30	(1.70)	2.40	2.40	0.40
	Cars < Workers HHs	-	-	-	(0.10)	(0.10)	(1.10)	0.40	0.40	(1.60)	0.80	0.80	(0.20)
	Cars >= Workers HHs	-	(0.03)	(0.10)	(2.70)	(2.70)	(3.70)	(1.20)	(1.20)	(2.20)	(1.60)	(1.60)	(2.60)
HBO OP	0 Car HHs	-	0.20	0.30	2.10	2.10	0.50	0.80	0.80	(0.80)	2.70	2.70	1.10
	Cars < Workers HHs	-	0.02	0.01	(1.40)	(1.40)	(2.00)	(1.10)	(1.10)	(1.70)	(0.90)	(0.90)	(1.50)
	Cars >= Workers HHs	-	0.02	0.01	(1.40)	(1.40)	(2.00)	(1.10)	(1.10)	(1.70)	(0.90)	(0.90)	(1.50)
NHB OP	All HHs	-	-	-	-	-	(1.00)	-	-	(1.00)	-	-	(1.00)
HBU OP	All HHs	-	-	-	(1.00)	(1.00)	(1.60)	(1.00)	(1.00)	(1.60)	(1.00)	(1.00)	(1.60)



In addition to the above market segment constants, the following mode choice nest constants were used to calibrate the mode choice model as shown in Table 5.5.

Table 5.5: Mode Choice Nest Constants

		Nesting Coeff	HBWPK	HBOPK	NHBPK	HBU PK	HBWOP	HBOOP	NHBOP	HBU OP
GRAND TOTAL										
NSTC 11	AUTO	0.50000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NSTC 12	TRANSIT	0.50000	0.17100	-1.48300	-1.30900	-0.90400	0.38300	-1.67300	-2.04000	-0.42500
AUTO										
NSTC 21	Drive Alone	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NSTC 22	Share Ride	0.50000	-2.40000	-0.06603	-0.66534	-0.07903	-2.38300	-0.07345	-0.70000	-0.08445
SHARE RIDE										
NSTC 31	Share Ride 2	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NSTC 32	Share Ride 3+	1.00000	-1.65454	-0.37315	-0.75298	-0.57715	-1.64963	-0.38960	-0.77675	-0.57660
TRANSIT										
NSTC 41	Walk Access	0.50000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NSTC 42	Park-ride Access	0.50000	-1.45809	-0.49340	-0.11276	-1.35040	-0.85520	-0.28426	2.18090	0.52026
NSTC 43	Drop-off Access	0.50000	-3.27376	-2.62375	-1.40648	-1.95075	-2.00088	-2.42093	0.39547	-0.62593
WALK ACCESS										
NSTC 51	Walk Access - Local/Mixed Mode -Walk Egress	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NSTC 52	Walk Access - Premium only -Walk Egress	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NSTC 53	Walk Access - Premium only -Auto Egress	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
PARK-RIDE ACCESS										
NSTC 61	Park-ride Access - Local/Mixed Mode -Walk Egress	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NSTC 62	Park-ride Access - Premium only -Walk Egress	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NSTC 63	Park-ride Access - Premium only -Auto Egress	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
DROP-OFF ACCESS										
NSTC 71	Drop-off Access - Local/Mixed Mode -Walk Egress	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NSTC 72	Drop-off Access - Premium only -Walk Egress	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NSTC 73	Drop-off Access - Premium only -Auto Egress	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

The market segment and nest constants are used appropriately at different nest levels in the utility calculations. The tables below show the combined magnitude of all the constants when scaled to the top-most level in terms of utils and equivalent IVTT.

Table 5.6: 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	0.6460	0.6460	0.1460	-0.5580	-0.5580	-1.0580	-1.0159	-1.0159	-1.5159
	Cars < Workers HHs	0.0000	-1.2000	-1.6136	0.1710	0.1710	-0.0790	-0.5830	-0.5830	-1.0830	-1.3659	-1.3659	-1.6159
	Cars >= Workers HHs	0.0000	-1.2075	-1.6386	-0.5290	-0.5290	-0.7790	-1.0330	-1.0330	-1.2830	-1.9659	-1.9659	-2.2159
HBO PK	0 Car HHs	0.0000	0.0420	-0.0513	-0.9330	-0.9330	-1.3330	-1.5547	-1.5547	-1.9547	-2.1199	-2.1199	-2.5199
	Cars < Workers HHs	0.0000	-0.0280	-0.1238	-1.8330	-1.8330	-1.9830	-2.0797	-2.0797	-2.2297	-2.9699	-2.9699	-3.1199
	Cars >= Workers HHs	0.0000	-0.0280	-0.1238	-1.8330	-1.8330	-1.9830	-2.0797	-2.0797	-2.2297	-2.9699	-2.9699	-3.1199
NHB PK	All HHs	0.0000	-0.3327	-0.5209	-1.3090	-1.3090	-1.5590	-1.3654	-1.3654	-1.6154	-2.0122	-2.0122	-2.2622
HBU PK	All HHs	0.0000	-0.0395	-0.1838	-1.1540	-1.1540	-1.3040	-1.8292	-1.8292	-1.9792	-2.1294	-2.1294	-2.2794
HBW OP													
HBW OP	0 Car HHs	0.0000	-0.9415	-1.2539	0.8830	0.8830	0.3830	0.0304	0.0304	-0.4696	-0.0174	-0.0174	-0.5174
	Cars < Workers HHs	0.0000	-1.1915	-1.6039	0.3580	0.3580	0.1080	0.0554	0.0554	-0.4446	-0.4174	-0.4174	-0.6674
	Cars >= Workers HHs	0.0000	-1.1990	-1.6289	-0.2920	-0.2920	-0.5420	-0.3446	-0.3446	-0.5946	-1.0174	-1.0174	-1.2674
HBO OP	0 Car HHs	0.0000	0.0133	-0.0591	-1.1480	-1.1480	-1.5480	-1.6151	-1.6151	-2.0151	-2.2085	-2.2085	-2.6085
	Cars < Workers HHs	0.0000	-0.0317	-0.1316	-2.0230	-2.0230	-2.1730	-2.0901	-2.0901	-2.2401	-3.1085	-3.1085	-3.2585
	Cars >= Workers HHs	0.0000	-0.0317	-0.1316	-2.0230	-2.0230	-2.1730	-2.0901	-2.0901	-2.2401	-3.1085	-3.1085	-3.2585
NHB OP	All HHs	0.0000	-0.3500	-0.5442	-2.0400	-2.0400	-2.2900	-0.9496	-0.9496	-1.1996	-1.8423	-1.8423	-2.0923
HBU OP	All HHs	0.0000	-0.0422	-0.1864	-0.6750	-0.6750	-0.8250	-0.4149	-0.4149	-0.5649	-0.9880	-0.9880	-1.1380



Table 5.7: 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)	26	26	6	(22)	(22)	(42)	(41)	(41)	(61)
	Cars < Workers HHs	-	(48)	(65)	7	7	(3)	(23)	(23)	(43)	(55)	(55)	(65)
	Cars >= Workers HHs	-	(48)	(66)	(21)	(21)	(31)	(41)	(41)	(51)	(79)	(79)	(89)
HBO PK	0 Car HHs	-	3	(3)	(62)	(62)	(89)	(104)	(104)	(130)	(141)	(141)	(168)
	Cars < Workers HHs	-	(2)	(8)	(122)	(122)	(132)	(139)	(139)	(149)	(198)	(198)	(208)
	Cars >= Workers HHs	-	(2)	(8)	(122)	(122)	(132)	(139)	(139)	(149)	(198)	(198)	(208)
NHB PK	All HHs	-	(13)	(21)	(52)	(52)	(62)	(55)	(55)	(65)	(80)	(80)	(90)
HBU PK	All HHs	-	(3)	(12)	(77)	(77)	(87)	(122)	(122)	(132)	(142)	(142)	(152)
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	-	1	(4)	(77)	(77)	(103)	(108)	(108)	(134)	(147)	(147)	(174)
	Cars < Workers HHs	-	(2)	(9)	(135)	(135)	(145)	(139)	(139)	(149)	(207)	(207)	(217)
	Cars >= Workers HHs	-	(2)	(9)	(135)	(135)	(145)	(139)	(139)	(149)	(207)	(207)	(217)
NHB OP	All HHs	-	(14)	(22)	(82)	(82)	(92)	(38)	(38)	(48)	(74)	(74)	(84)
HBU OP	All HHs	-	(3)	(12)	(45)	(45)	(55)	(28)	(28)	(38)	(66)	(66)	(76)

5.4. Mode Choice Refinements

During mode choice calibration several refinements were applied to improve the model’s representation of known travel behavior. These refinements are summarized in this section.

Long Transit Trips: The initial calibration results showed that the model under-stated the attractiveness of transit for long work trips. Consequently, for work trips, any auto travel time in excess of 45 minutes is factored by the out-of-vehicle coefficient rather than the in-vehicle coefficient. For example, a trip of 55 minutes would be weighted as 45 * IVTT + 10 * OVT. This computation is performed in the auto disutility equation.

Very Short Transit Trips: Without any restrictions, the model will produce large numbers of very short Tri-Rail trips (i.e., <10 miles). The observed data shows that less than 10% of all trips occur today. Consequently, an adjustment has been added to reflect premium transit riders’ evaluation of the worthiness of driving to and using premium transit given the time that they would spend on the system. Since most premium transit riders are choice riders in Southeast Florida, their alternative is to continue to drive to their destination.

This rule is based on the ratio of total time spent driving to and using a premium transit mode to the potential time spent driving to their

destination. The rule computes a time penalty, which is added to premium transit IVT. Shorter premium transit trips receive higher penalties. A secondary adjustment (as shown in P’) helps to minimize the size of the penalty as the overall trip length increases. The penalty is eliminated if the potential auto-only trip is 40 or more minutes in length. The penalty is currently applied to the auto-access utilities, and reduced the number of short Tri-Rail trips without impacting other premium modes.

$$\text{Ratio} = \frac{\text{Transit IVT} + \text{Auto Access Time} + \text{Total Wait Time} + \text{Auto Egress Time}}{0 - D \text{ Auto Time}}$$

$$\text{Total Wait Time} = \text{Initial wait} + \text{Transfer wait times (un-weighted)}$$

Auto Egress Time is used only for auto egress paths

$$P = (\text{Ratio} - 1) * 60$$

$$P' = P * \frac{(40 - \text{OD Auto Time})}{(20 + \text{OD Auto Time})/2} * 2.5$$

$$P'' = \text{MIN}(P', 100)$$

$$\text{Penalty} = \text{MAX}(P'', 0)$$

Pedestrian Environment Factor: A process has been incorporated to reflect the easier walk environment in higher-density areas and less-desirable walk environment in lower-density

areas. A penalty, expressed in terms of IVTT minutes, is added to the walk-access and egress time. In SERPM the area types are computed using the activity density of the zone, which is defined as:

$$ActivityDensity_i = \frac{Population_i + 2 * Employment_i}{Area_i}$$

The following values are used:

Table 5.8: Pedestrian Environment Factors (in equivalent IVTT minutes)		
Area Type	Broward and Miami-Dade Counties	Palm Beach County
Central Business Districts	1	3
High density (CBD fringe areas)	2	6
Medium density (generally outlying business districts)	3	9
Low density (residential areas)	4	12
Very low density (rural areas)	5	15

The Palm Beach County values are three times the values of Broward and Miami-Dade Counties to offset the higher activity densities in Palm Beach County due to their smaller zone sizes. For example, a walk trip originating or destining in a very low density area of the Palm Beach County gets an additional 15minutes. The same walk trip originating or destining in a very low density area of the Broward or Miami Dade counties gets an additional 5 minutes.

Alternative-Specific Constants: Premium services like Metrorail and Tri-Rail have amenities that provide additional comfort and safety benefits to their passengers when compared to an equivalent trip on bus services. Such benefits are not

included in the mode choice utility equations. The following alternative-specific constants (ASCs) are used:

Table 5.9: ASCs for Transit Line-Haul Modes (for all access modes, equivalent IVTT)		
Mode	IVTT Reduction	Constant
Local Bus	0%	0
Express Bus	0%	0
Metrorail	15%	Metrorail IVTT up to 10 minutes
Tri-Rail	20%	Tri-Rail IVTT up to 15 minutes

For example, a PNR trip which used Tri-Rail for 12 minutes would receive a 3-minute reduction in Tri-Rail IVTT ($12 * 0.20 = 2.4$) and a 9.6-minute bonus ($12 * (1-0.20) = 9.6 < 15$). A similar trip using Tri-Rail for 36 minutes would receive a 7.2-minute reduction in Tri-Rail IVTT and a 15-minute bonus ($36 * (1-0.20) = 28.8 > 15$).



Technical Appendix

Palm Tran and Broward County Transit (BCT) Tables

Metrorail Figures and Tables

I-95X and I-95E Tables

Tri-Rail Figures and Tables



Table B-1: 2010 Palm Tran Survey District-to-District Linked Trip Flows (includes school and university trips)

Production District	Attraction District																					Total	Total %		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21				
1 - West Palm Beach CBD	137	0	0	50	9	32	62	299	114	82	0	12	0	0	14	0	0	0	0	0	0	0	811	3%	
2 - Jupiter	0	90	0	43	0	22	17	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	199	1%	
3 - West Jupiter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
4 - Juno Beach	23	29	0	179	0	159	104	234	85	9	9	0	0	18	0	0	0	0	0	0	6	0	855	3%	
5 - Palm Beach Gardens	7	0	0	10	80	16	92	87	35	3	0	0	0	1	155	0	8	26	0	0	7	527	2%		
6 - North Palm Beach	85	16	0	214	23	435	175	491	488	96	32	32	11	14	12	0	0	11	0	23	1	2,156	8%		
7 - Haverhill	111	19	0	122	107	397	604	475	678	118	49	6	31	0	116	0	13	34	0	32	0	2,911	10%		
8 - Palm Beach CBD Fringe	256	21	0	202	31	572	322	1,268	535	297	42	59	17	44	60	0	0	19	0	0	21	3,766	13%		
9 - Palm Springs	111	0	0	13	53	267	538	462	2,720	837	480	130	151	133	408	20	12	44	0	35	4	6,419	23%		
10 - South Palm Beach	109	0	0	72	29	147	106	245	967	1,160	128	307	18	185	104	7	9	0	0	0	8	3,602	13%		
11 - North Mid Boca	5	0	0	8	4	0	170	21	545	83	697	204	214	55	0	10	0	0	0	16	0	2,030	7%		
12 - Delray	6	0	0	4	0	10	6	28	152	362	210	525	17	183	5	11	0	0	0	13	0	1,532	5%		
13 - South Mid Boca	0	0	0	0	0	5	16	18	125	23	130	27	100	104	3	86	0	0	0	10	0	648	2%		
14 - Boca Raton	10	0	0	31	0	39	12	6	121	118	47	168	123	323	0	37	0	0	0	93	31	1,159	4%		
15 - Wellington	9	0	0	0	41	2	81	32	175	64	0	4	0	0	5	0	15	71	0	4	0	504	2%		
16 - West Boca	0	0	0	0	0	0	0	0	19	5	25	27	56	47	0	81	0	0	0	17	0	278	1%		
17 - Pahokee	0	0	0	0	25	0	0	7	19	0	0	0	0	0	12	0	39	50	0	0	0	153	1%		
18 - Belle Glade	1	0	0	0	48	12	47	15	141	6	0	0	0	0	95	0	64	135	0	0	0	565	2%		
19 - Lake Okeechobee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	
20 - Broward County	0	0	0	6	11	0	30	63	14	0	14	30	42	68	0	14	0	0	0	0	0	292	1%		
21 - Miami-Dade County	0	0	0	3	0	3	0	0	12	0	0	0	0	0	5	0	0	0	0	0	0	23	0%		
Total	871	173	0	956	462	2,119	2,381	3,776	6,945	3,262	1,862	1,531	780	1,181	990	266	161	389	0	249	73	28,430	100%		
Total %	3%	1%	0%	3%	2%	7%	8%	13%	24%	11%	7%	5%	3%	4%	3%	1%	1%	1%	0%	1%	0%	100%			
Intra-District Flows	8,580																								
% Intra-District Flows	30%																								

Table B-2: Palm Tran Estimated District-to-District Linked Trip Flows (includes school and university trips)

Production District	Attraction District																					Total	Total %		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21				
1 - West Palm Beach CBD	114	4	0	30	11	55	143	255	68	65	4	20	5	6	4	0	0	0	0	2	1	785	3%		
2 - Jupiter	8	241	0	108	2	21	7	10	5	1	1	3	1	3	0	0	0	0	0	2	5	418	1%		
3 - West Jupiter	0	4	0	8	0	2	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	17	0%		
4 - Juno Beach	47	98	1	622	5	225	55	100	22	8	2	3	1	3	1	0	0	0	0	1	1	1,195	4%		
5 - Palm Beach Gardens	61	4	0	20	187	22	149	85	102	11	9	5	8	6	85	1	1	5	0	6	1	767	3%		
6 - North Palm Beach	123	51	1	621	26	622	227	428	99	23	23	16	13	8	5	1	0	1	0	2	1	2,291	8%		
7 - Haverhill	271	24	0	129	147	181	708	487	323	58	27	13	19	13	35	2	0	2	0	4	1	2,445	8%		
8 - Palm Beach CBD Fringe	616	56	0	288	46	413	548	1,110	240	128	27	34	22	20	15	1	0	5	0	5	2	3,575	12%		
9 - Palm Springs	292	11	0	72	106	146	526	363	2,518	499	387	209	143	81	144	9	1	2	0	26	3	5,540	19%		
10 - South Palm Beach	310	17	0	68	44	56	173	354	746	597	135	367	53	147	33	7	0	3	0	23	1	3,134	11%		
11 - North Mid Boca	7	1	0	3	2	7	13	29	178	0	43	496	219	274	109	5	17	0	0	34	3	1,441	5%		
12 - Delray	16	1	0	7	1	17	11	21	116	117	337	547	137	315	1	10	0	0	0	43	2	1,700	6%		
13 - South Mid Boca	1	0	0	1	0	2	2	2	22	4	108	34	324	229	0	74	0	0	0	83	1	886	3%		
14 - Boca Raton	4	0	0	1	0	1	6	4	11	13	56	164	220	720	1	32	0	0	0	95	1	1,327	5%		
15 - Wellington	30	1	0	19	117	8	60	44	229	27	24	9	20	15	187	2	0	4	0	16	6	819	3%		
16 - West Boca	0	0	0	1	1	1	1	3	8	1	27	8	287	181	1	196	0	0	0	87	0	803	3%		
17 - Pahokee	5	1	0	2	52	2	6	7	14	2	1	1	0	1	41	0	60	84	0	1	0	280	1%		
18 - Belle Glade	6	1	0	2	53	4	23	14	35	6	5	5	3	8	113	0	16	242	0	6	0	544	2%		
19 - Lake Okeechobee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	
20 - Broward County	14	2	0	8	2	13	28	18	14	21	64	47	182	297	3	88	0	0	0	0	0	801	3%		
21 - Miami-Dade County	36	1	0	0	8	4	5	21	6	26	25	9	46	8	2	5	0	0	0	0	0	201	1%		
Total	1,961	516	3	2,011	811	1,801	2,691	3,356	4,756	1,649	1,758	1,713	1,759	2,170	676	445	78	348	0	436	29	28,968	100%		
Total %	7%	2%	0%	7%	3%	6%	9%	12%	16%	6%	6%	6%	6%	7%	2%	2%	0%	1%	0%	2%	0%	100%			
Intra-District Flows	9,491																								
% Intra-District Flows	33%																								



Table B-3: Palm Tran Boarding by Route (includes school and university trips)

Route	Operator	Peak			Off-peak			Daily		
		Observed	Estimated	Difference	Observed	Estimated	Difference	Observed	Estimated	Difference
1	41	4,242	4,439	197	3,187	4,837	1,650	7,429	9,276	1,847
2	41	2,623	2,570	(53)	2,160	2,961	801	4,783	5,531	748
3	41	2,771	1,771	(1,000)	2,115	1,918	(197)	4,886	3,689	(1,197)
4	41	148	110	(38)	132	120	(12)	280	230	(50)
10	41	179	379	200	93	448	355	272	827	555
11	42		34			-			34	
20	41	195	278	83	111	300	189	306	578	272
21	41	172	231	59	157	372	215	329	603	274
30	41	253	273	20	138	135	(3)	391	408	17
31	41	1,065	538	(527)	610	569	(41)	1,675	1,107	(568)
33	41	564	646	82	271	259	(12)	835	905	70
40	41	433	412	(21)	291	387	96	724	799	75
41	41	78	247	169	4	-	(4)	82	247	165
43	41	956	977	21	703	1,187	484	1,659	2,164	505
44	41	317	545	228	178	261	83	495	806	311
45	41	92	115	23	95	135	40	187	250	63
46	41	603	564	(39)	505	319	(186)	1,108	883	(225)
47	41	193	126	(67)	213	136	(77)	406	262	(144)
48	41	157	165	8	111	190	79	268	355	87
49	41	139	139	-	125	164	39	264	303	39
52	41	61	152	91	73	177	104	134	329	195
60	41	63	88	25	46	123	77	109	211	102
61	41	339	247	(92)	253	291	38	592	538	(54)
62	41	1,098	915	(183)	720	1,148	428	1,818	2,063	245
63	41	347	237	(110)	226	269	43	573	506	(67)
64	41	192	102	(90)	112	125	13	304	227	(77)
70	41	690	798	108	333	387	54	1,023	1,185	162
71	41	66	102	36	46	94	48	112	196	84
73	41	144	169	25	107	180	73	251	349	98
80	41	265	184	(81)	245	223	(22)	510	407	(103)
81	41	260	126	(134)	183	172	(11)	443	298	(145)
91	41	468	731	263	309	977	668	777	1,708	931
92	41	262	432	170	162	501	339	424	933	509
94	12	315	313	(2)	160	124	(36)	475	437	(38)
95	42	15	19	4	0	-	-	15	19	4
Total Ridership		19,765	19,174	(625)	14,174	19,489	5,315	33,939	38,663	4,724



Table B-4: 2010 BCT Survey District-to-District Linked Trip Flows (includes school and university trips)

Production District	Attraction District																				Total	Total %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
1-Ft Lauderdale CBD	17	88	72	18	31	8	82	6	8	0	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	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	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	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	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	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	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	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	17	42	105	64	15	7	21	0	7	0	785	1%
10-Weston	3	0	7	0	0	0	12	21	78	30	0	55	2	9	11	0	0	0	0	0	255	0%
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%	
Intra-District Flows	18,396																					
% Intra-District Flows	22%																					

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

Table B-5: BCT Estimated District-to-District Linked Trip Flows (includes school and university trips)

Production District	Attraction District																				Total	Total %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
1-Ft Lauderdale CBD	258	413	275	65	96	24	54	29	10	2	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	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	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	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	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	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	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	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	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	30	159	31	25	10	7	2	0	68	10	993	1%
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%	
Intra-District Flows	25,933																					
% Intra-District Flows	31%																					



Table B-6: BCT Boarding by Route (includes school and university trips)

Route	Operator	Peak			Off-peak			Daily		
		Observed	Estimated	Difference	Observed	Estimated	Difference	Observed	Estimated	Difference
1	31	3,307	3,292	(15)	3,921	4,052	131	7,228	7,344	116
101	32	919	1,151	232	-	-	-	919	1,151	232
2	31	2,917	3,647	730	3,421	3,686	265	6,338	7,333	996
102	32	903	2,325	1,422	-	-	-	903	2,325	1,422
3	31	311	371	60	217	392	175	528	763	236
4	31	553	492	(61)	475	502	27	1,028	994	(34)
5	31	983	963	(20)	578	374	(204)	1,561	1,337	(224)
6	31	1,140	1,148	8	1,033	1,322	289	2,174	2,470	296
7	31	2,194	2,766	572	2,051	2,766	715	4,245	5,532	1,287
9	31	1,036	977	(59)	1,010	1,042	32	2,046	2,019	(27)
10	31	1,908	1,934	26	2,075	2,481	406	3,984	4,415	432
11	31	1,806	1,828	22	1,644	2,053	409	3,450	3,881	431
12	31	959	978	19	828	1,160	332	1,787	2,138	352
14	31	1,920	1,555	(365)	1,698	1,523	(175)	3,618	3,078	(540)
15	31	285	206	(79)	259	258	(1)	544	464	(80)
16	31	668	1,267	599	452	571	119	1,120	1,838	718
17	31	125	101	(24)	140	124	(16)	266	225	(41)
18	31	7,532	5,716	(1,816)	7,107	6,499	(608)	14,639	12,215	(2,424)
441	32	1,720	729	(991)	198	-	(198)	1,918	729	(1,189)
20	31	643	500	(143)	514	643	129	1,157	1,143	(14)
22	31	2,113	1,890	(223)	2,102	1,637	(465)	4,216	3,527	(689)
23	31	367	844	477	213	698	485	580	1,542	962
28	31	2,463	2,509	46	1,987	1,947	(40)	4,450	4,456	6
30	31	1,196	1,050	(146)	1,037	1,046	9	2,234	2,096	(138)
31	31	2,133	1,545	(588)	1,634	1,284	(350)	3,767	2,829	(938)
34	31	1,609	1,175	(434)	1,215	1,264	49	2,825	2,439	(386)
36	31	3,767	2,735	(1,032)	3,409	2,175	(1,234)	7,176	4,910	(2,266)
40	31	1,937	1,923	(14)	2,094	1,494	(600)	4,031	3,417	(614)
42	31	1,294	1,043	(251)	1,050	1,115	65	2,345	2,158	(187)
48	31	400	432	32	331	557	226	731	989	258
50	31	2,668	2,160	(508)	2,078	1,737	(341)	4,746	3,897	(849)
55	31	1,511	1,795	284	1,045	1,909	864	2,556	3,704	1,148
56	31	960	990	30	847	1,086	239	1,807	2,076	270
57	31	92	101	9	48	107	59	140	208	68
60	31	2,568	1,975	(593)	1,715	1,735	20	4,283	3,710	(573)
62	31	1,289	1,275	(14)	836	1,443	607	2,125	2,718	593
72	31	3,931	3,284	(647)	3,661	2,733	(928)	7,593	6,017	(1,576)
81	31	1,044	491	(553)	1,292	526	(766)	2,336	1,017	(1,319)
83	31	762	1,267	505	508	1,014	506	1,270	2,281	1,012
88	31	606	761	155	363	348	(15)	970	1,109	140
Total Ridership		64,540	61,191	(3,349)	55,085	55,303	218	119,624	116,494	(3,130)



**Table B-7: Palm Tran Observed vs. Estimated Linked Trips (includes school and university trips)
(by Period by Purpose by Market Segment by Access Mode by Line Haul Mode)**

Observed Transit Trips														Estimated Transit Trips													
PalmTran			WALK			PNR			KNR			Total	Total %	WALK			PNR			KNR			Total	Total %			
TOD	Purpose	Availability	Local/Mixed walk	Premium walk	Premium Auto	Local/Mixed walk	Premium walk	Premium Auto	Local/Mixed walk	Premium walk	Premium Auto			Local/Mixed walk	Premium walk	Premium Auto	Local/Mixed walk	Premium walk	Premium Auto	Local/Mixed walk	Premium walk	Premium Auto					
PK	HBW	0-Car	3,131	0	0	11	0	0	84	0	0	3,225	12%	2,702	0	0	2	0	0	77	0	0	2,781	10%			
		Workers > Cars	2,366	0	0	20	0	0	181	0	0	2,567	10%	1,665	0	0	7	0	0	68	0	0	1,740	6%			
		Cars >= Workers	707	0	0	31	0	0	78	0	0	815	3%	1,107	0	0	8	0	0	67	0	0	1,182	4%			
	HBO	0-Car	2,541	0	0	0	0	0	67	0	0	2,608	10%	2,244	0	0	2	0	0	240	0	0	2,486	9%			
		Other	2,662	0	0	40	0	0	93	0	0	2,795	11%	2,460	0	0	11	0	0	356	0	0	2,827	10%			
NHB Total			3,097	0	0	29	0	0	125	0	0	3,251	12%	2,621	0	0	1	0	0	95	0	0	2,718	10%			
OP	HBW	0-Car	1,428	0	0	0	0	0	25	0	0	1,453	6%	1,996	0	0	1	0	0	211	0	0	2,208	8%			
		Workers > Cars	1,510	0	0	2	0	0	102	0	0	1,614	6%	1,110	0	0	3	0	0	150	0	0	1,263	5%			
		Cars >= Workers	525	0	0	89	0	0	101	0	0	715	3%	911	0	0	6	0	0	152	0	0	1,069	4%			
	HBO	0-Car	2,076	0	0	0	0	0	20	0	0	2,095	8%	2,845	0	0	3	0	0	378	0	0	3,226	12%			
		Other	2,587	0	0	12	0	0	107	0	0	2,706	10%	2,991	0	0	15	0	0	356	0	0	3,362	12%			
NHB Total			1,834	0	0	43	0	0	298	0	0	2,175	8%	2,466	0	0	6	0	0	313	0	0	2,785	10%			
Total			24,464	0	0	278	0	0	1,278	0	0	26,019	100%	25,119	0	0	65	0	0	2,463	0	0	27,647	100%			
Total %			94%	0%	0%	1%	0%	0%	5%	0%	0%	100%		91%	0%	0%	0%	0%	0%	9%	0%	0%	100%				
PK HBU Total			1,040	0	0	34	0	0	240	0	0	1,314	54%	466	0	0	1	0	0	31	0	0	498	38%			
OP HBU Total			917	0	0	0	0	0	181	0	0	1,098	46%	706	0	0	6	0	0	111	0	0	822	62%			
Total			1,956	0	0	34	0	0	421	0	0	2,411	100%	1,172	0	0	7	0	0	142	0	0	1,321	100%			
Total %			81%	0%	0%	1%	0%	0%	17%	0%	0%	100%		89%	0%	0%	1%	0%	0%	11%	0%	0%	100%				
Grand Total			26,420	0	0	311	0	0	1,699	0	0	28,430		26,291	0	0	73	0	0	2,604	0	0	28,968				
Grand Total %			93%	0%	0%	1%	0%	0%	6%	0%	0%	100%		91%	0%	0%	0%	0%	0%	9%	0%	0%	100%				



Table B-8: BCT Observed vs. Estimated Linked Trips (includes school and university trips)
(by Period by Purpose by Market Segment by Access Mode by Line Haul Mode)

Observed Transit Trips														Estimated Transit Trips													
BCT*			WALK			PNR			KNR			Total	Total %	WALK			PNR			KNR			Total	Total %			
TOD	Purpose	Availability	Local/Mixed walk	Premium Walk	Premium auto	Local/Mixed walk	Premium Walk	Premium auto	Local/Mixed walk	Premium Walk	Premium auto			Local/Mixed walk	Premium Walk	Premium auto	Local/Mixed walk	Premium Walk	Premium auto	Local/Mixed walk	Premium Walk	Premium auto					
PK	HBW	0-Car	10,090	0	0	249	0	0	452	0	0	10,791	14%	9,568	0	0	6	0	0	120	0	0	9,695	12%			
		Workers>Cars	5,402	0	0	305	0	0	64	0	0	5,771	7%	6,643	0	0	78	0	0	182	0	0	6,903	9%			
		Cars>=Workers	4,173	0	0	479	0	0	455	0	0	5,107	7%	4,679	0	0	218	0	0	191	0	0	5,088	6%			
	HBO	0-Car	5,264	0	0	211	0	0	562	0	0	6,036	8%	4,281	0	0	20	0	0	318	0	0	4,619	6%			
		Other	6,296	0	0	549	0	0	270	0	0	7,115	9%	6,944	0	0	261	0	0	502	0	0	7,708	10%			
NHB Total			6,865	0	0	313	0	0	148	0	0	7,326	9%	7,421	0	0	89	0	0	137	0	0	7,647	9%			
OP	HBW	0-Car	6,653	0	0	57	0	0	443	0	0	7,153	9%	7,198	0	0	4	0	0	272	0	0	7,475	9%			
		Workers>Cars	3,190	0	0	161	0	0	216	0	0	3,566	5%	4,410	0	0	96	0	0	269	0	0	4,775	6%			
		Cars>=Workers	3,451	0	0	242	0	0	225	0	0	3,918	5%	3,776	0	0	445	0	0	283	0	0	4,504	6%			
	HBO	0-Car	6,410	0	0	147	0	0	419	0	0	6,976	9%	5,273	0	0	33	0	0	410	0	0	5,715	7%			
		Other	7,058	0	0	541	0	0	386	0	0	7,985	10%	8,015	0	0	621	0	0	441	0	0	9,076	11%			
NHB Total			5,798	0	0	527	0	0	311	0	0	6,636	8%	6,627	0	0	600	0	0	426	0	0	7,653	9%			
Total			70,649	0	0	3,781	0	0	3,950	0	0	78,380	100%	74,835	0	0	2,470	0	0	3,552	0	0	80,857	100%			
Total %			90%	0%	0%	5%	0%	0%	5%	0%	0%	100%		93%	0%	0%	3%	0%	0%	4%	0%	0%	100%				
PK HBU Total			2,051	0	0	163	0	0	16	0	0	2,230	48%	1,511	0	0	59	0	0	64	0	0	1,634	42%			
OP HBU Total			2,155	0	0	217	0	0	55	0	0	2,427	52%	1,823	0	0	284	0	0	179	0	0	2,286	58%			
Total			4,206	0	0	380	0	0	71	0	0	4,657	100%	3,334	0	0	343	0	0	243	0	0	3,920	100%			
Total %			90%	0%	0%	8%	0%	0%	2%	0%	0%	100%		85%	0%	0%	9%	0%	0%	6%	0%	0%	100%				
Grand Total			74,855	0	0	4,161	0	0	4,021	0	0	83,036		78,170	0	0	2,813	0	0	3,795	0	0	84,777				
Grand Total %			90%	0%	0%	5%	0%	0%	5%	0%	0%	100%		92%	0%	0%	3%	0%	0%	4%	0%	0%	100%				

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



Table M-1: Metrorail Survey Station-to-Station Linked Trips

Total Production Station	Attraction Station																						Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22						
1-Palmetto	0	0	27	47	0	0	0	0	3	0	557	3	35	695	115	32	22	28	17	19	23	43	1,667	3%	0	0%	1,667	8%
2-Okeechobee	34	0	0	0	75	0	6	14	2	9	433	9	83	686	51	38	8	61	9	32	10	39	1,600	3%	34	0%	1,566	7%
3-Hialeah	70	0	0	11	40	22	35	0	124	5	328	19	15	421	66	35	19	71	40	34	44	25	1,424	3%	70	0%	1,354	6%
4-Tri-Rail	86	51	14	0	80	0	0	0	5	43	688	0	34	698	283	20	27	30	85	154	13	37	2,346	5%	151	1%	2,195	10%
5-Northside	124	39	113	52	0	20	33	9	28	15	510	30	56	461	97	97	22	226	53	55	82	90	2,212	4%	328	1%	1,884	9%
6-Dr.MLK Jr.	37	41	40	15	23	0	34	61	41	0	363	49	15	277	57	41	31	73	46	4	28	35	1,312	3%	157	1%	1,156	5%
7-Brownsville	65	16	0	17	174	45	0	62	5	0	289	27	34	186	6	0	0	35	23	34	6	40	1,066	2%	318	1%	748	3%
8-Earlington Heights	40	25	26	9	150	0	42	0	9	0	407	32	66	455	7	13	7	169	40	51	47	116	1,711	3%	292	1%	1,419	7%
9-Allapattah	29	26	32	25	141	19	54	61	0	0	177	49	23	196	30	11	39	209	214	110	37	68	1,552	3%	388	1%	1,164	5%
10-Santa Clara	31	9	39	0	21	0	0	41	0	0	92	25	11	79	28	0	0	57	58	22	28	46	587	1%	142	0%	445	2%
11-Civic Center	15	21	9	19	48	63	32	0	81	0	0	0	37	441	74	29	43	27	204	43	103	109	1,397	3%	288	1%	1,109	5%
12-Culmer	3	3	16	3	8	9	57	17	10	0	172	0	51	131	33	11	6	116	69	83	83	73	950	2%	295	1%	655	3%
13-Overtown	5	5	39	0	29	11	15	43	0	0	144	0	0	198	61	23	48	130	53	57	29	24	913	2%	292	1%	622	3%
14-Government Center	107	16	81	257	58	87	51	98	39	135	773	11	183	0	87	116	186	601	232	180	378	441	4,117	8%	1,897	6%	2,220	10%
15-Brickell	121	41	29	14	95	0	52	0	0	32	336	164	6	69	0	0	27	328	253	70	35	218	1,891	4%	960	3%	931	4%
16-Vizcaya	0	17	41	11	0	0	0	0	0	0	144	48	35	204	72	0	50	130	174	91	93	107	1,216	2%	571	2%	645	3%
17-Coconut Grove	14	3	22	21	3	6	3	3	22	3	182	3	30	345	77	28	0	158	105	157	187	147	1,518	3%	765	3%	753	4%
18-Douglas Road	25	37	0	25	43	16	0	22	66	39	382	28	58	711	280	30	20	0	85	189	60	211	2,327	5%	1,783	6%	544	3%
19-University	5	0	10	14	25	41	11	0	29	3	537	10	14	296	72	19	0	128	0	0	89	67	1,370	3%	1,214	4%	155	1%
20-South Miami	9	0	0	22	56	37	17	4	54	0	921	4	164	1,511	140	18	56	102	95	0	97	83	3,389	7%	3,209	11%	180	1%
21-Dadeland North	24	0	8	10	14	70	15	4	49	37	1,918	131	286	2,977	743	72	113	397	184	578	0	85	7,715	15%	7,630	26%	85	0%
22-Dadeland South	55	55	84	144	44	153	31	23	139	55	2,144	157	492	3,036	744	40	176	703	297	105	104	0	8,783	17%	8,783	30%	0	0%
Total	901	406	630	716	1,127	597	490	463	705	377	11,496	799	1,727	14,073	3,123	672	899	3,781	2,335	2,068	1,575	2,105	51,065	100%	29,566	100%	21,499	100%
Total %	2%	1%	1%	1%	2%	1%	1%	1%	1%	1%	23%	2%	3%	28%	6%	1%	2%	7%	5%	4%	3%	4%	100%					
NB Total	901	406	603	657	932	555	382	317	489	305	7,653	556	1,269	9,149	2,129	207	364	1,330	575	683	104	0	29,566	58%				
NB %	3%	1%	2%	2%	3%	2%	1%	1%	2%	1%	26%	2%	4%	31%	7%	1%	1%	4%	2%	2%	0%	0%	100%					
SB Total	0	0	27	59	195	42	108	147	217	72	3,844	243	459	4,924	993	465	535	2,451	1,760	1,384	1,470	2,105	21,499	42%				
SB %	0%	0%	0%	0%	1%	0%	1%	1%	1%	0%	18%	1%	2%	23%	5%	2%	2%	11%	8%	6%	7%	10%	100%					

Table M-2: Metrorail Estimated Station-to-Station Linked Trips

Total Production Station	Attraction Station																						Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22						
1-Palmetto	3	115	40	37	48	27	13	58	11	17	591	17	91	417	187	18	31	35	74	14	7	13	1,865	4%	3	0%	1,862	13%
2-Okeechobee	270	0	33	71	53	29	13	56	15	31	277	13	63	338	118	14	23	22	30	9	3	5	1,486	3%	270	1%	1,216	8%
3-Hialeah	191	48	0	97	27	15	7	33	11	23	303	11	50	271	109	15	24	26	24	18	15	20	1,338	3%	240	1%	1,098	8%
4-Tri-Rail	149	46	19	0	6	12	7	18	11	18	390	32	64	278	165	16	33	22	61	23	21	36	1,425	3%	214	1%	1,211	8%
5-Northside	212	124	28	16	0	14	8	26	7	11	285	11	43	146	51	24	11	35	42	18	20	32	1,163	2%	380	1%	783	5%
6-Dr.MLK Jr.	101	53	10	45	6	0	4	10	3	12	290	8	49	220	54	7	4	16	25	11	16	23	966	2%	214	1%	752	5%
7-Brownsville	56	22	8	21	6	4	0	10	5	15	233	11	35	107	41	4	5	18	11	4	4	5	624	1%	117	0%	508	4%
8-Earlington Heights	52	49	18	45	9	9	7	0	5	15	437	18	58	214	108	7	10	36	55	16	27	23	1,219	2%	189	0%	1,030	7%
9-Allapattah	39	49	10	51	6	7	8	9	0	18	650	23	77	270	145	22	63	88	173	46	52	75	1,882	4%	177	0%	1,704	12%
10-Santa Clara	16	15	6	9	2	4	6	9	4	0	75	8	31	108	50	4	8	12	6	3	3	4	382	1%	71	0%	311	2%
11-Civic Center	24	20	18	33	7	9	10	34	24	7	0	14	51	236	142	21	43	40	10	9	19	15	788	1%	188	0%	600	4%
12-Culmer	23	11	12	40	6	7	9	12	6	12	119	0	31	29	39	17	39	37	18	17	33	24	540	1%	256	1%	284	2%
13-Overtown	13	14	15	22	17	14	8	12	6	9	194	6	0	5	24	29	81	67	50	27	82	49	744	1%	330	1%	414	3%
14-Government Center	44	24	65	93	16	26	18	25	16	43	623	13	24	0	21	35	158	146	151	82	134	132	1,888	4%	1,029	3%	859	6%
15-Brickell	35	29	36	49	10	42	36	83	51	33	586	34	64	4	0	17	103	78	98	60	66	51	1,565	3%	1,092	3%	473	3%
16-Vizcaya	13	5	4	11	2	3	2	3	3	10	150	8	33	77	31	0	29	24	48	25	19	27	527	1%	354	1%	173	1%
17-Coconut Grove	9	11	7	25	3	2	2	11	8	16	252	24	71	269	153	23	0	76	126	55	61	79	1,281	2%	885	2%	397	3%
18-Douglas Road	10	8	11	32	12	22	7	18	17	17	390	44	131	467	232	33	71	0	161	37	111	121	1,954	4%	1,523	4%	431	3%
19-University	5	5	3	7	2	7	2	4	6	5	147	8	37	178	108	13	56	68	0	32	26	23	741	1%	659	2%	82	1%
20-South Miami	15	9	9	15	9	15	13	18	17	47	478	25	139	568	301	41	153	135	294	0	63	66	2,400	5%	2,271	6%	129	1%
21-Dadeland North	82	58	60	129	40	82	38	55	139	71	1,816	129	590	2,327	1,156	187	474	881	808	301	0	89	9,512	18%	9,423	25%	89	1%
22-Dadeland South	162	103	161	262	103	178	120	139	249	163	3,656	280	1,487	5,499	1,659	245	692	1,489	1,335	358	108	0	18,446	35%	18,446	48%	0	0%
Total	1,523	816	571	1,109	389	527	339	642	614	562	11,944	736	3,219	12,028	4,892	791	2,111	3,349	3,600	1,166	891	916	52,737	100%	38,330	100%	14,407	100%
Total %	3%	2%	1%	2%	1%	1%	1%	1%	1%	1%	23%	1%	6%	23%	9%	2%	4%	6%	7%	2%	2%	2%	100%					
NB Total	1,521	702	498	905	255	431	286	431	547	402	8,413	571	2,575	9,389	3,638	543	1,446	2,572	2,438	659	108	0</						



Table M-3: Metrorail Survey Station-to-Station Linked Trips - Walk Access

Walk Access	Attraction Station																						Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22						
1-Palmetto	0	0	27	10	0	0	0	0	3	0	59	0	5	100	8	0	3	8	3	0	0	28	252	1%	0	0%	252	2%
2-Okeechobee	34	0	0	0	20	0	6	8	2	9	117	5	2	145	9	27	6	9	5	32	2	32	471	2%	34	0%	437	3%
3-Hialeah	57	0	0	11	40	22	35	0	124	5	169	5	5	208	15	15	0	23	24	29	44	25	858	3%	57	0%	801	6%
4-Tri-Rail	54	0	7	0	55	0	0	0	5	28	101	0	0	215	39	0	0	0	22	27	13	0	566	2%	61	0%	505	4%
5-Northside	98	26	113	52	0	20	33	9	28	15	259	30	19	205	4	69	22	144	0	51	44	74	1,317	5%	290	2%	1,027	8%
6-Dr.MLK Jr.	37	0	40	15	23	0	34	52	41	0	280	49	10	189	57	33	31	65	35	4	10	31	1,037	4%	115	1%	922	7%
7-Brownsville	50	16	0	17	174	45	0	62	5	0	275	27	11	137	0	0	0	29	11	12	6	34	913	3%	303	2%	610	4%
8-Earlington Heights	28	25	26	9	150	0	42	0	9	0	298	32	28	342	0	7	7	129	30	40	26	75	1,301	5%	279	2%	1,021	7%
9-Allapattah	13	0	32	25	141	0	54	61	0	0	177	49	23	163	30	11	31	146	66	40	37	33	1,134	4%	327	2%	807	6%
10-Santa Clara	31	9	39	0	11	0	0	41	0	0	57	25	11	79	28	0	0	57	41	22	28	16	494	2%	131	1%	363	3%
11-Civic Center	5	16	9	14	19	63	32	0	64	0	0	37	420	74	29	43	18	200	43	96	73	1,256	4%	223	2%	1,033	8%	
12-Culmer	0	0	16	3	8	9	57	17	10	0	162	0	0	120	33	11	6	92	54	49	83	68	796	3%	280	2%	515	4%
13-Overtown	5	5	26	0	29	5	15	43	0	0	134	0	0	198	34	15	48	109	39	52	9	19	784	3%	261	2%	523	4%
14-Government Center	107	16	81	221	58	87	51	64	39	122	751	11	183	0	75	116	157	578	224	167	331	413	3,852	14%	1,791	12%	2,061	15%
15-Brickell	121	41	24	5	95	0	52	0	0	32	336	164	6	51	0	0	27	321	245	70	35	203	1,829	6%	928	6%	901	7%
16-Vizcaya	0	17	41	11	0	0	0	0	0	0	86	48	11	93	32	0	50	130	142	55	79	14	809	3%	339	2%	471	3%
17-Coconut Grove	12	3	3	21	3	3	3	3	22	3	62	3	0	139	67	28	0	145	94	54	178	106	949	3%	372	3%	577	4%
18-Douglas Road	25	32	0	13	30	11	0	22	66	34	201	23	31	308	205	30	14	0	71	189	60	181	1,547	5%	1,046	7%	501	4%
19-University	5	0	10	14	25	41	11	0	29	3	233	0	14	145	53	10	0	128	0	0	70	49	840	3%	721	5%	119	1%
20-South Miami	9	0	0	18	56	37	17	0	54	0	255	4	9	116	23	12	56	69	95	0	97	64	990	4%	829	6%	161	1%
21-Dadeland North	9	0	0	10	10	33	15	4	12	33	445	63	80	790	213	18	100	297	161	578	0	58	2,929	10%	2,871	20%	58	0%
22-Dadeland South	55	39	78	116	44	81	28	23	35	31	496	51	144	911	167	28	134	403	173	83	104	0	3,227	11%	3,227	22%	0	0%
Total	757	248	571	584	991	457	487	409	548	315	4,953	589	629	5,075	1,165	457	734	2,898	1,735	1,597	1,352	1,600	28,150	100%	14,485	100%	13,664	100%
Total %	3%	1%	2%	2%	4%	2%	2%	1%	2%	1%	18%	2%	2%	18%	4%	2%	3%	10%	6%	6%	5%	6%	100%					
NB Total	757	248	544	562	875	415	379	278	331	258	3,162	367	478	2,553	759	125	304	897	429	661	104	0	14,485		51%			
NB %	5%	2%	4%	4%	6%	3%	2%	2%	2%	2%	22%	3%	3%	18%	5%	1%	2%	6%	3%	5%	1%	0%	100%					
SB Total	0	0	27	22	116	42	108	132	217	57	1,791	222	151	2,522	406	332	430	2,001	1,306	936	1,247	1,600	13,664		49%			
SB %	0%	0%	0%	0%	1%	0%	1%	1%	2%	0%	13%	2%	1%	18%	3%	2%	3%	15%	10%	7%	9%	12%	100%					

Table M-4: Metrorail Estimated Station-to-Station Linked Trips - Walk Access

Walk Access	Attraction Station																						Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22						
1-Palmetto	1	27	14	11	9	4	2	2	1	1	17	1	3	21	4	0	1	1	1	1	1	1	123	0%	1	0%	122	1%
2-Okeechobee	132	0	11	50	34	17	7	40	7	13	101	6	28	170	43	7	10	12	6	6	2	2	704	3%	132	1%	572	7%
3-Hialeah	151	32	0	90	20	11	5	27	7	15	164	6	29	191	79	11	17	21	12	14	13	17	931	4%	183	1%	748	9%
4-Tri-Rail	71	27	13	0	4	8	6	10	3	5	71	17	10	65	30	4	6	4	8	8	8	7	384	2%	111	1%	273	3%
5-Northside	113	99	12	4	0	4	2	16	2	6	149	3	22	104	28	19	5	25	6	13	13	23	667	3%	228	1%	439	5%
6-Dr.MLK Jr.	90	51	9	43	3	0	1	8	2	10	212	4	35	176	43	5	3	12	12	8	12	11	751	3%	196	1%	555	7%
7-Brownsville	49	19	7	19	4	2	0	8	4	13	205	9	27	79	33	4	4	17	9	3	4	5	524	2%	100	1%	424	5%
8-Earlington Heights	46	46	16	44	8	8	4	0	2	12	406	15	50	194	96	6	9	35	54	15	27	23	1,117	5%	172	1%	945	11%
9-Allapattah	27	41	7	45	4	5	4	0	4	246	8	32	150	68	9	27	52	53	26	32	37	881	4%	138	1%	743	9%	
10-Santa Clara	10	12	5	7	1	3	4	6	1	0	11	3	11	39	14	3	6	10	2	2	2	2	153	1%	49	0%	105	1%
11-Civic Center	23	20	18	33	7	9	9	34	24	7	0	13	51	236	141	21	42	40	10	9	19	15	781	3%	183	1%	597	7%
12-Culmer	21	11	11	40	6	7	8	12	6	11	106	0	31	29	39	16	39	36	17	17	32	23	520	2%	240	1%	280	3%
13-Overtown	12	13	15	21	17	14	8	11	6	9	178	5	0	3	23	27	72	60	34	23	76	33	659	3%	307	2%	352	4%
14-Government Center	44	24	65	93	16	25	18	25	16	42	620	13	22	0	21	32	149	135	123	76	122	120	1,799	7%	1,022	6%	778	9%
15-Brickell	34	29	36	48	10	42	35	82	50	32	582	34	63	4	0	16	102	77	96	60	66	50	1,549	6%	1,082	7%	467	6%
16-Vizcaya	10	4	3	9	2	2	1	3	2	8	121	6	20	50	23	0	14	13	27	17	14	17	366	1%	264	2%	102	1%
17-Coconut Grove	8	10	7	25	3	1	2	11	7	14	212	21	56	212	114	14	0	65	105	48	57	71	1,061	4%	715	4%	346	4%
18-Douglas Road	7	7	11	31	12	21	6	17	15	12	237	36	91	309	131	18	31	0	123	32	107	113	1,368	6%	993	6%	375	4%
19-University	4	3	2	6	1	6	2	3	5	3	58	5	18	76	47	7	35	44	0	23	22	17	390	2%	328	2%	61	1%
20-South Miami	9	6	6	6	3	9	8	7	9	6	153	11	38	181	106	18	72	58	115	0	59	62	942	4%	821	5%	121	1%
21-Dadeland North	27	31	37	73	16	49	16	14	81	30	472	59	227	853	442	102	207	496	298	146	0	9	3,683	15%	3,674	22%	9	0%
22-Dadeland South	47	63	97	147	42	90	46	35	129	37	554	117	393	1,626	466	98	266	741	328	143	6	0	5,471	22%	5,471	33%	0	0%
Total	936	575	399	845	221	338	197	377	379	289	4,875	389	1,257	4,769	1,990	439	1,117	1,954	1,436	689	694	657	24,823	100%	16,410	100%	8,413	100%
Total %	4%	2%	2%	3%	1%	1%	2%	2%	2%	1%	20%	2%	5%	19%	8%	2%	4%	8%	6%	3%	3%	3%	100%					
NB Total	935	548	374	694	155	294	174	265	351	210	3,293	306	928	3,309	1,329	258	611	1,339	741	289	6	0	16,409		66%			
NB %	6%	3%	2%	4%	1%	2%	1%	2%	2%	1%	20%	2%	6%	20%	8%	2%	4%	8%	5%	2%	0%	0%	100%					
SB Total	1	27	25	151	66	44	23	112	28	79	1,582	83	329	1,460	661	181	506	615	695	399	688	657	8,414		34%			
SB %	0%	0%	0%	2%	1%	1%	0%	1%	0%	1%	19%	1%	4%	17%	8%	2%												



Table M-5: Metrorail Survey Station-to-Station Linked Trips - PNR Access

PNR Access Production Station	Attraction Station																						Total	Total %	NB Total	NB %	SB Total	SB %		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22								
1-Palmetto	0	0	0	37	0	0	0	0	0	0	403	0	25	455	64	21	0	10	5	0	0	3	1,023	6%	0	0%	1,023	19%		
2-Okeechobee	0	0	0	0	0	0	0	6	0	0	276	2	73	463	37	5	0	21	2	0	6	5	896	5%	0	0%	896	17%		
3-Hialeah	0	0	0	0	0	0	0	0	0	0	144	0	5	166	45	0	0	15	10	0	0	0	386	2%	0	0%	386	7%		
4-Tri-Rail	7	37	7	0	24	0	0	0	0	0	15	489	0	24	389	201	20	0	30	63	127	0	1,450	8%	51	0%	1,399	26%		
5-Northside	0	0	0	0	0	0	0	0	0	0	179	0	32	184	46	0	0	52	31	0	14	9	547	3%	0	0%	547	10%		
6-Dr.MLK Jr.	0	0	0	0	0	0	0	9	0	0	37	0	5	57	0	0	0	8	12	0	0	0	127	1%	0	0%	127	2%		
7-Brownsville	15	0	0	0	0	0	0	0	0	0	10	0	12	43	6	0	0	6	6	0	0	0	98	1%	15	0%	83	2%		
8-Earlington Heights	0	0	0	0	0	0	0	0	0	0	109	0	38	107	7	0	0	13	0	4	0	35	313	2%	0	0%	313	6%		
9-Allapattah	0	13	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	11	22	0	0	6	65	0%	13	0%	51	1%		
10-Santa Clara	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0	0	0	0	11	0	0	12	59	0%	0	0%	59	1%		
11-Civic Center	10	0	0	5	29	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	31	85	0%	44	0%	41	1%		
12-Culmer	0	0	0	0	0	0	0	0	0	0	10	0	51	11	0	0	0	0	5	0	0	5	81	0%	10	0%	71	1%		
13-Overtown	0	0	0	0	0	6	0	0	0	0	10	0	0	0	27	8	0	22	14	4	0	4	95	1%	17	0%	79	1%		
14-Government Center	0	0	0	7	0	0	0	35	0	0	22	0	0	12	0	29	0	0	14	37	13	167	1%	63	1%	104	2%			
15-Brickell	0	0	0	10	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	27	0%	27	0%	0	0%	0	0%	
16-Vizcaya	0	0	0	0	0	0	0	0	0	0	50	0	24	85	13	0	0	0	32	0	0	53	257	1%	172	1%	85	2%		
17-Coconut Grove	0	0	0	0	0	0	0	0	0	0	114	0	30	178	11	0	0	0	0	60	0	24	417	2%	333	3%	84	2%		
18-Douglas Road	0	0	0	0	0	5	0	0	0	5	156	0	18	252	22	0	5	0	7	0	0	470	3%	463	4%	7	0%	0	0%	
19-University	0	0	0	0	0	0	0	0	0	0	238	0	0	106	19	0	0	0	0	0	0	363	2%	363	3%	0	0%	0	0%	
20-South Miami	0	0	0	4	0	0	0	4	0	0	624	0	155	1,232	107	6	0	16	0	0	0	2,149	12%	2,149	18%	0	0%	0	0%	
21-Dadeland North	9	0	0	0	0	18	0	0	12	4	1,343	37	167	1,811	441	20	13	45	23	0	0	3,943	23%	3,943	33%	0	0%	0	0%	
22-Dadeland South	0	0	6	16	0	69	0	0	17	12	1,345	38	317	1,741	403	9	18	157	65	5	0	4,218	24%	4,218	36%	0	0%	0	0%	
Total	41	50	13	78	54	98	0	54	29	36	5,594	77	976	7,320	1,459	88	65	408	309	215	57	216	17,235	100%	11,880	100%	5,355	100%		
Total %	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	32%	0%	6%	42%	8%	1%	0%	2%	2%	1%	0%	1%	100%							
NB Total	41	50	13	41	29	98	0	39	29	21	3,912	75	711	5,424	1,015	35	36	219	89	5	0	0	11,880	69%						
NB %	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	33%	1%	6%	46%	9%	0%	0%	2%	1%	0%	0%	0%	100%							
SB Total	0	0	0	37	24	0	0	15	0	15	1,682	2	265	1,896	445	53	29	188	221	210	57	216	5,355	31%						
SB %	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	31%	0%	5%	35%	8%	1%	1%	4%	4%	4%	1%	4%	100%							

Table M-6: Metrorail Estimated Station-to-Station Linked Trips - PNR Access

PNR Access Production Station	Attraction Station																						Total	Total %	NB Total	NB %	SB Total	SB %	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22							
1-Palmetto	2	72	22	22	24	18	9	48	9	13	501	14	76	336	155	14	24	29	68	12	6	11	1,483	7%	2	0%	1,482	32%	
2-Okeechobee	109	0	16	14	13	9	4	10	6	13	131	5	25	116	57	5	9	7	19	2	1	1	573	3%	109	1%	463	10%	
3-Hialeah	34	12	0	6	5	3	2	4	3	6	109	4	16	64	24	3	5	4	9	3	1	2	319	2%	46	0%	273	6%	
4-Tri-Rail	48	10	3	0	0	2	1	5	5	8	217	9	38	126	97	8	16	12	34	9	8	18	673	3%	61	0%	612	13%	
5-Northside	66	16	11	8	0	8	5	8	3	4	111	7	17	39	19	4	5	7	28	4	5	6	381	2%	101	1%	280	6%	
6-Dr.MLK Jr.	6	1	1	1	2	0	2	1	1	2	52	2	11	33	7	1	1	2	7	2	1	6	141	1%	10	0%	131	3%	
7-Brownsville	5	1	1	1	1	1	0	1	1	1	22	2	7	27	8	0	0	0	2	0	0	0	84	0%	11	0%	73	2%	
8-Earlington Heights	4	1	0	1	0	1	2	0	2	2	20	2	6	19	11	0	1	0	1	0	0	0	74	0%	9	0%	66	1%	
9-Allapattah	9	6	3	4	1	2	2	4	0	10	312	12	39	119	74	9	23	26	96	14	13	25	804	4%	30	0%	774	17%	
10-Santa Clara	6	2	1	1	1	1	2	2	3	0	54	4	19	69	36	1	2	1	5	1	1	2	214	1%	20	0%	193	4%	
11-Civic Center	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0	0%	0	0%
12-Culmer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0%	0	0%	2	0%	
13-Overtown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0	0%	0	0%
14-Government Center	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4	6	19	3	3	3	40	0%	1	0%	40	1%	
15-Brickell	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0	0%	0	0%
16-Vizcaya	2	1	0	2	0	0	1	1	1	2	26	2	12	28	8	0	11	8	18	6	4	8	140	1%	84	1%	56	1%	
17-Coconut Grove	1	0	0	0	0	0	0	0	0	1	33	2	12	49	32	5	0	7	16	5	2	5	172	1%	137	1%	34	1%	
18-Douglas Road	2	1	0	1	0	0	0	1	1	4	120	6	31	134	84	11	28	0	29	4	3	5	465	2%	425	3%	40	1%	
19-University	1	1	0	0	0	0	0	1	1	1	72	2	15	89	51	4	15	17	0	7	3	4	284	1%	271	2%	13	0%	
20-South Miami	5	2	2	4	4	3	4	7	6	8	257	10	77	301	144	15	56	55	135	0	3	3	1,100	5%	1,095	7%	5	0%	
21-Dadeland North	34	17	12	23	14	13	14	25	32	26	956	45	231	961	457	49	164	229	368	96	0	54	3,818	19%	3,764	23%	54	1%	
22-Dadeland South	87	32	38	71	43	56	52	77	78	93	2,566	116	806	2,892	924	102	305	488	818	150	71	0	9,865	48%	9,865	62%	0	0%	
Total	418	175	111	159	108	118	100	194	153	195	5,559	245	1,440	5,400	2,188	232	668	898	1,672	317	125	154	20,630	100%	16,039	100%	4,591	100%	
Total %	2%	1%	1%	1%	1%	1%	0%	1%	1%	1%	27%	1%	7%	26%	11%	1%	3%	4%	8%	2%	1%	1%	100%						
NB Total	416	103	73	118	66	79	77	117	123	136	4,030	182	1,185	4,452	1,700	186	567	789	1,321	246	71	0	16,038	78%					
NB %	3%	1%	0%	1%	0%																								



Table M-7: Metrorail Survey Station-to-Station Linked Trips - KNR Access

KNR Access Production Station	Attraction Station																						Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22						
1-Palmetto	0	0	0	0	0	0	0	0	0	0	95	3	5	140	43	11	20	11	10	19	23	13	392	7%	0	0%	392	16%
2-Okeechobee	1	0	0	0	55	0	0	0	0	0	40	2	7	77	5	7	2	30	2	0	2	2	234	4%	1	0%	233	9%
3-Hialeah	13	0	0	0	0	0	0	0	0	0	15	14	5	46	5	19	19	33	5	5	0	0	181	3%	13	0%	168	7%
4-Tri-Rail	25	14	0	0	0	0	0	0	0	0	97	0	10	94	43	0	27	0	0	0	0	21	330	6%	39	1%	291	12%
5-Northside	26	13	0	0	0	0	0	0	0	0	72	0	4	72	46	29	0	31	22	4	23	6	349	6%	38	1%	311	13%
6-Dr.MLK Jr.	0	41	0	0	0	0	0	0	0	0	46	0	0	31	0	8	0	0	0	0	18	4	148	3%	41	1%	107	4%
7-Brownsville	0	0	0	0	0	0	0	0	0	0	5	0	11	6	0	0	0	0	6	21	0	6	55	1%	0	0%	55	2%
8-Earlington Heights	13	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	0	27	10	7	21	7	97	2%	13	0%	84	3%
9-Allapattah	16	13	0	0	0	19	0	0	0	0	0	0	0	22	0	0	8	52	126	70	0	29	354	6%	47	1%	306	12%
10-Santa Clara	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	34	150	3%	10	0%	23	1%
11-Civic Center	0	4	0	0	0	0	0	0	17	0	0	0	0	10	0	0	0	9	3	0	7	5	56	1%	21	1%	35	1%
12-Culmer	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	10	34	0	0	0	74	1%	5	0%	69	3%
13-Overtown	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	34	1%	14	0%	20	1%
14-Government Center	0	0	0	29	0	0	0	0	0	14	0	0	0	0	0	0	23	8	0	10	14	14	98	2%	43	1%	55	2%
15-Brickell	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	8	8	0	0	15	35	150	3%	61	2%	89	4%
16-Vizcaya	0	0	0	0	0	0	0	0	0	7	0	0	26	27	0	0	0	0	36	14	39	150	3%	61	2%	89	4%	
17-Coconut Grove	3	0	19	0	0	3	0	0	0	0	6	0	0	29	0	0	14	10	42	9	17	152	3%	60	2%	92	4%	
18-Douglas Road	0	5	0	13	13	0	0	0	0	0	24	5	10	151	53	0	0	0	7	0	0	29	310	5%	274	9%	36	1%
19-University	0	0	0	0	0	0	0	0	0	0	66	10	0	45	0	10	0	0	0	19	18	167	3%	131	4%	36	1%	
20-South Miami	0	0	0	0	0	0	0	0	0	0	41	0	0	163	11	0	16	0	0	0	19	251	4%	232	7%	19	1%	
21-Dadeland North	5	0	8	0	4	18	0	0	26	0	130	31	39	376	90	35	0	54	0	0	27	843	15%	816	25%	27	1%	
22-Dadeland South	0	16	0	13	0	3	3	0	87	12	304	68	30	384	173	3	24	143	58	18	0	0	1,338	24%	1,338	42%	0	0%
Total	104	108	46	54	82	42	3	0	129	26	949	133	122	1,678	498	127	100	475	291	257	166	289	5,680	100%	3,200	100%	2,480	100%
Total %	2%	2%	1%	1%	1%	1%	0%	0%	2%	0%	17%	2%	2%	30%	9%	2%	2%	8%	5%	5%	3%	5%	100%					
NB Total	104	108	46	54	27	42	3	0	129	26	579	114	80	1,172	355	47	24	213	58	18	0	0	3,200	56%				
NB %	3%	3%	1%	2%	1%	1%	0%	0%	4%	1%	18%	4%	2%	37%	11%	1%	1%	7%	2%	1%	0%	0%	100%					
SB Total	0	0	0	0	55	0	0	0	0	0	371	18	43	506	142	80	76	262	233	239	166	289	2,480	44%				
SB %	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	15%	1%	2%	20%	6%	3%	3%	11%	9%	10%	7%	12%	100%					

Table M-8: Metrorail Estimated Station-to-Station Linked Trips - KNR Access

KNR Access Production Station	Attraction Station																						Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22						
1-Palmetto	0	16	5	4	15	5	2	8	2	3	73	3	12	60	28	4	6	5	5	2	1	2	259	4%	0	0%	259	18%
2-Okeechobee	29	0	5	6	7	4	2	6	2	5	44	2	10	52	19	2	4	3	6	1	0	1	209	3%	29	0%	181	13%
3-Hialeah	7	5	0	2	2	1	1	1	1	2	29	1	5	17	5	1	2	2	3	1	0	1	88	1%	11	0%	77	5%
4-Tri-Rail	31	9	3	0	2	2	1	3	3	5	102	6	16	86	39	4	11	7	19	6	5	11	368	5%	43	1%	326	23%
5-Northside	34	9	5	4	0	2	2	2	1	1	24	1	3	3	4	1	2	2	8	1	2	3	115	2%	51	1%	64	5%
6-Dr.MLK Jr.	5	1	0	1	0	0	1	0	0	1	26	1	3	11	4	0	0	2	6	2	2	6	74	1%	8	0%	66	5%
7-Brownsville	2	1	0	1	1	1	1	0	1	0	7	1	1	0	0	0	0	0	0	0	0	0	17	0%	6	0%	11	1%
8-Earlington Heights	3	1	1	1	1	1	1	0	1	1	11	1	2	0	0	0	0	0	0	0	0	1	27	0%	8	0%	19	1%
9-Allapattah	3	2	1	1	0	1	1	1	0	5	92	3	6	1	3	4	13	10	24	6	8	12	197	3%	9	0%	187	13%
10-Santa Clara	1	0	0	0	0	0	0	0	1	0	10	0	1	0	0	0	0	0	0	0	0	0	15	0%	3	0%	12	1%
11-Civic Center	1	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	7	0%	4	0%	3	0%
12-Culmer	1	0	1	0	0	0	0	0	0	0	13	0	1	0	0	0	0	0	0	0	0	0	19	0%	17	0%	2	0%
13-Overtown	1	1	1	1	0	0	0	0	0	1	16	1	0	1	1	2	9	7	16	5	6	16	85	1%	23	0%	62	4%
14-Government Center	0	0	0	0	0	0	0	0	0	0	3	0	2	0	0	1	5	5	9	4	9	9	48	1%	7	0%	42	3%
15-Brickell	0	0	0	1	0	0	0	0	0	0	5	0	1	0	0	0	1	1	2	1	0	1	16	0%	9	0%	7	0%
16-Vizcaya	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	4	3	4	2	2	2	2	22	0%	6	0%	16	1%
17-Coconut Grove	0	0	0	0	0	0	0	0	0	0	8	1	3	9	7	3	0	4	5	2	2	4	49	1%	32	1%	17	1%
18-Douglas Road	0	0	0	0	0	0	0	1	1	33	2	9	24	17	5	12	0	9	1	1	4	121	2%	105	2%	16	1%	
19-University	0	0	0	0	0	0	0	0	1	17	1	4	13	9	2	6	6	0	3	2	3	67	1%	60	1%	7	1%	
20-South Miami	1	1	1	4	1	2	1	3	2	3	68	4	24	87	51	8	25	22	45	0	1	2	357	5%	355	6%	3	0%
21-Dadeland North	22	11	12	34	10	19	9	15	26	16	389	25	131	513	257	35	103	157	142	59	0	26	2,011	28%	1,984	34%	26	2%
22-Dadeland South	27	8	26	44	19	32	21	27	42	33	537	48	287	981	268	45	121	259	189	64	31	0	3,111	43%	3,111	53%	0	0%
Total	170	66	62	105	59	71	42	71	82	78	1,510	102	521	1,859	714	120	325	497	492	160	73	105	7,284	100%	5,881	100%	1,403	100%
Total %	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	21%	1%	7%	26%	10%	2%	4%	7%	7%	2%	1%	1%	100%					
NB Total	170	50	51	93	33	57	35	49	73	57	1,090	83	462	1,627	610	98	267	444	376	124	31	0	5,881	81%				
NB %	3%	1%	1%	2%	1%	1%	1%	1%	1%	1%	19%	1%	8%	28%	10%	2%	5%	8%	6%	2%	1%	0%	100%					
SB Total	0	16	10	12	26	14	7	22	9	21	419	19	59	232	104	22	58	52	116	37	42	105	1,403	19%				
SB %	0%	1%	1%	1%	2%	1%	1%	2%	1%	2%	30%	1%	4%	17%	7%	2%	4%	4%	8%	3%	3%	7%	100%					

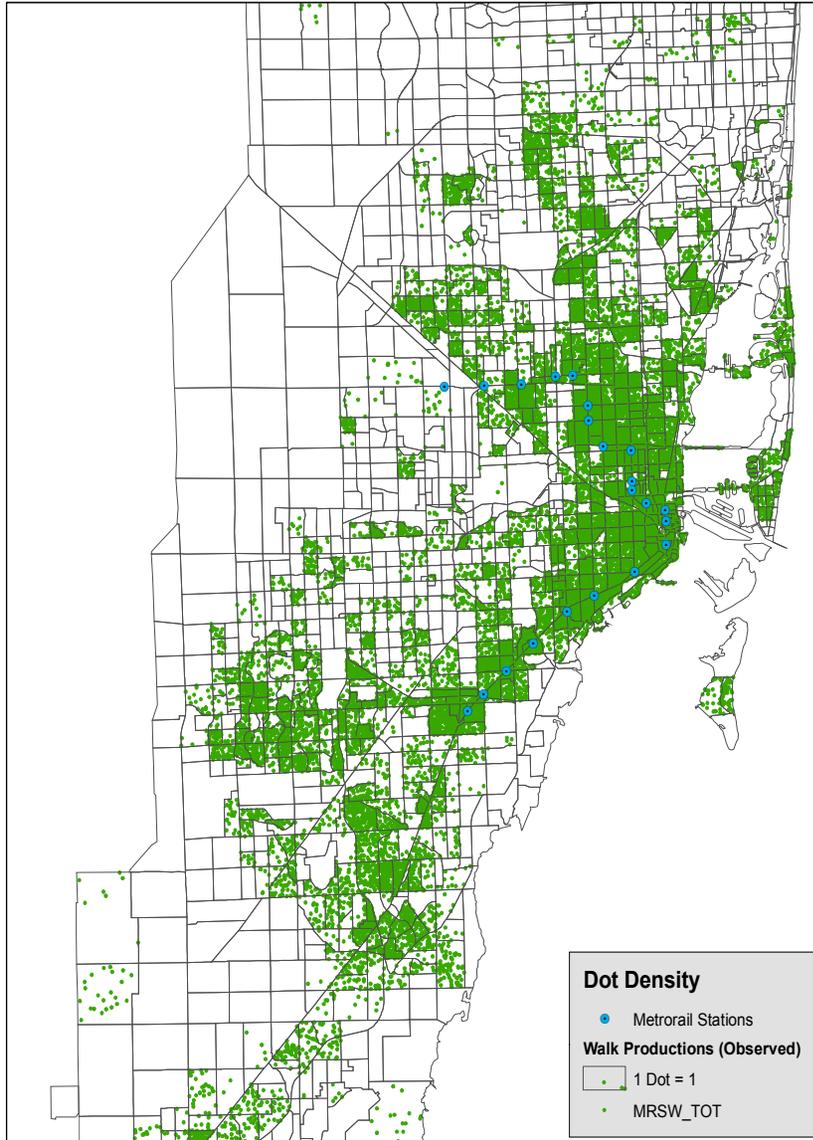


**Table M-9: Metrorail Observed vs. Estimated Linked Trips
(by Period by Purpose by Market Segment by Access Mode by Line Haul Mode)**

Observed Transit Trips														Estimated Transit Trips													
Metrorail			WALK			PNR			KNR			Total	Total %	WALK			PNR			KNR			Total	Total %			
TOD	Purpose	Availability	Local/Mixed walk	Premium walk	Premium Auto	Local/Mixed walk	Premium walk	Premium Auto	Local/Mixed walk	Premium walk	Premium Auto			Local/Mixed walk	Premium walk	Premium Auto	Local/Mixed walk	Premium walk	Premium Auto	Local/Mixed walk	Premium walk	Premium Auto					
PK	HBW	0-Car	1,371	512	42	37	27	9	54	59	11	2,124	4%	3,933	934	19	11	41	0	257	233	1	5,430	10%			
		Workers > Cars	2,208	1,141	106	719	1,448	95	575	908	131	7,330	14%	3,530	562	33	391	1,715	2	632	810	34	7,709	15%			
		Cars >= Workers	2,375	1,372	218	2,673	6,636	356	669	755	117	15,173	30%	3,121	720	20	2,104	9,077	221	1,061	1,328	31	17,682	34%			
	HBO	0-Car	210	158	25	0	0	0	17	0	0	410	1%	620	452	9	4	22	0	53	118	2	1,280	2%			
		Other	1,702	784	205	116	190	21	439	195	143	3,795	7%	727	341	87	140	702	196	162	327	98	2,781	5%			
	NHB Total			940	798	176	182	212	51	97	139	35	2,628	5%	754	890	64	25	638	45	26	184	16	2,642	5%		
OP	HBW	0-Car	1,397	588	18	10	10	22	36	26	10	2,116	4%	1,338	547	18	2	17	0	164	220	2	2,308	4%			
		Workers > Cars	1,613	682	119	205	377	51	216	132	78	3,472	7%	892	359	22	82	668	1	161	435	25	2,645	5%			
		Cars >= Workers	1,090	453	113	619	2,171	32	198	174	0	4,850	9%	902	589	17	286	3,185	111	128	471	16	5,703	11%			
	HBO	0-Car	729	552	22	0	22	0	9	9	0	1,341	3%	598	477	18	3	13	0	38	66	2	1,215	2%			
		Other	2,091	1,218	175	180	355	0	142	139	19	4,320	8%	495	350	122	68	400	139	24	69	22	1,689	3%			
	NHB Total			1,313	1,424	210	111	242	57	74	61	14	3,506	7%	484	710	70	18	271	32	11	51	6	1,652	3%		
Total			17,039	9,682	1,428	4,851	11,690	694	2,525	2,596	559	51,065	100%	17,394	6,931	498	3,135	16,748	747	2,717	4,312	255	52,737	100%			
Total %			33%	19%	3%	10%	23%	1%	5%	5%	1%	100%		33%	13%	1%	6%	32%	1%	5%	8%	0%	100%				
PK	HBU Total		831	627	44	117	200	14	138	153	21	2,145	31%	856	380	18	66	590	14	107	304	14	2,348	50%			
OP	HBU Total		1,772	1,353	36	237	722	16	197	319	22	4,674	69%	668	425	27	41	866	39	31	243	18	2,357	50%			
Total			2,603	1,980	80	353	922	30	335	472	43	6,819	100%	1,524	804	46	106	1,456	53	137	546	32	4,706	100%			
Total %			38%	29%	1%	5%	14%	0%	5%	7%	1%	100%		32%	17%	1%	2%	31%	1%	3%	12%	1%	100%				
Grand Total			19,642	11,663	1,508	5,205	12,612	724	2,860	3,069	601	57,884		18,918	7,735	544	3,241	18,204	800	2,854	4,858	287	57,442				
Grand Total %			34%	20%	3%	9%	22%	1%	5%	5%	1%	100%		33%	13%	1%	6%	32%	1%	5%	8%	0%	100%				

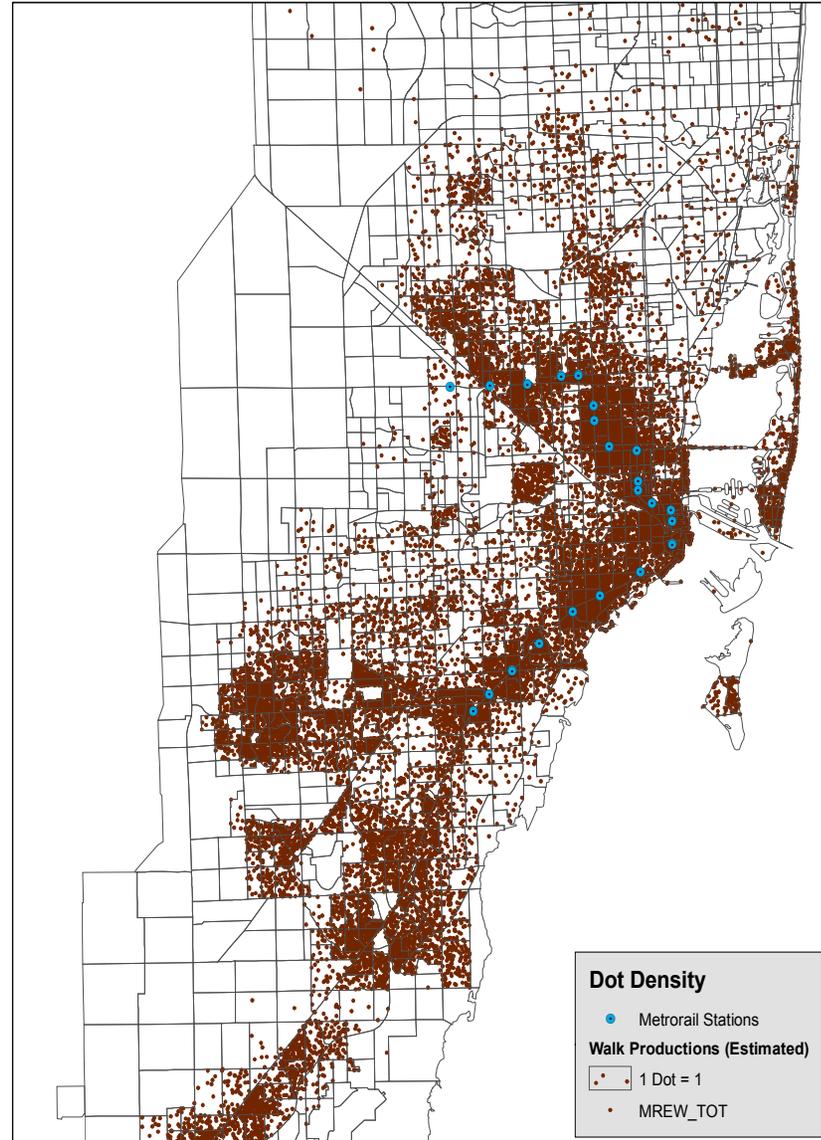
Metrorail Walk Productions (Observed)

11/29/2011



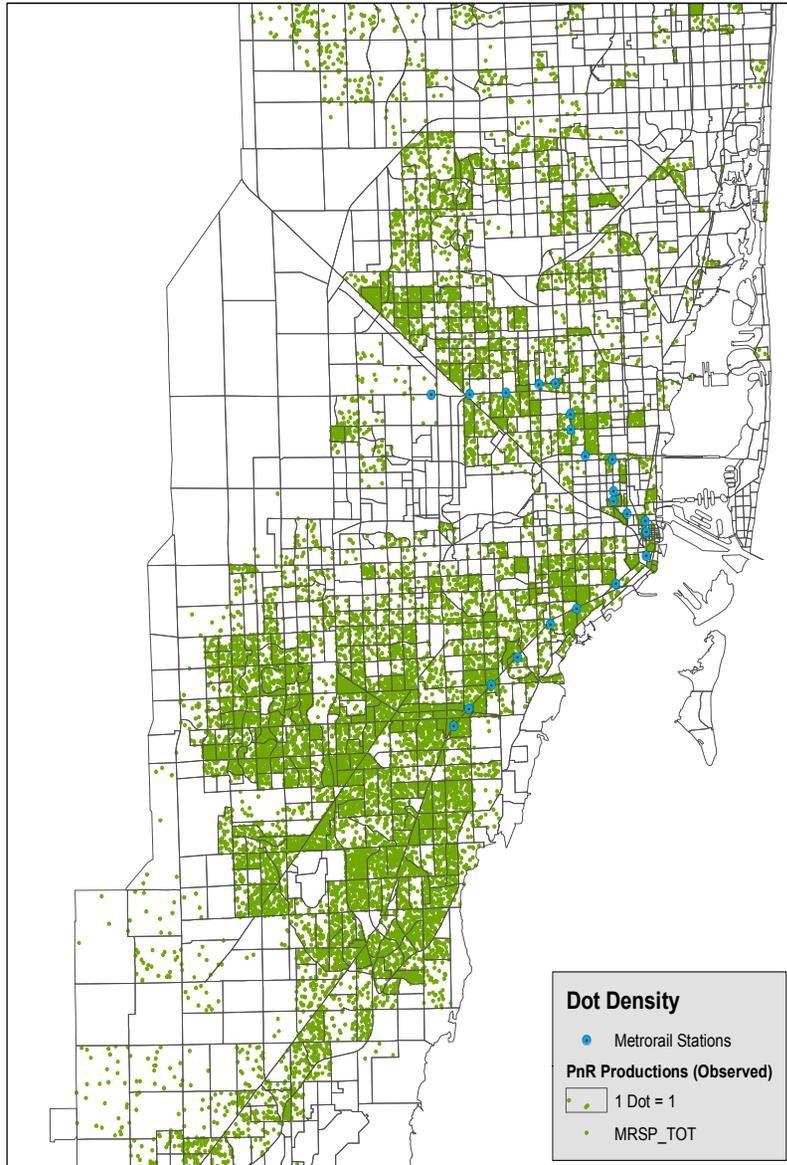
Metrorail Walk Productions (Estimated)

2/7/2012



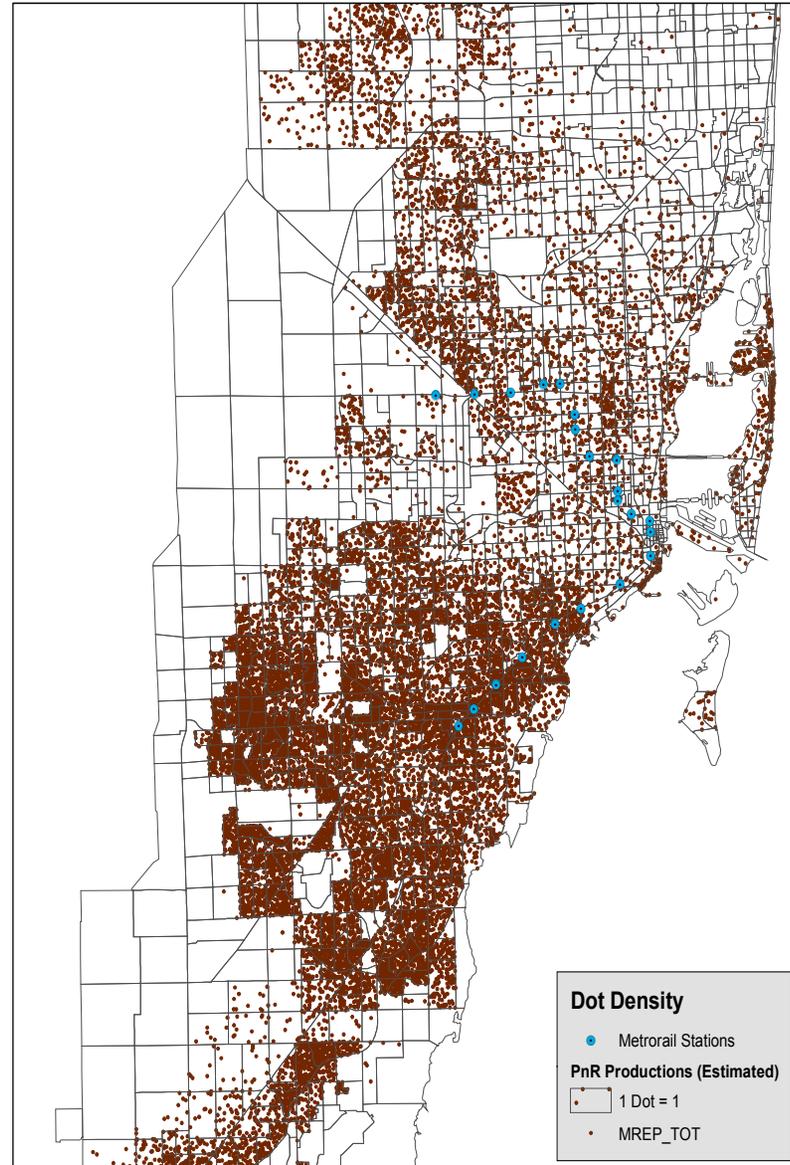
Metrorail PNR Productions (Observed)

11/29/2011



Metrorail PNR Productions (Estimated)

2/7/2012



Metrorail KNR Productions (Observed/Estimated) 2/7/2012

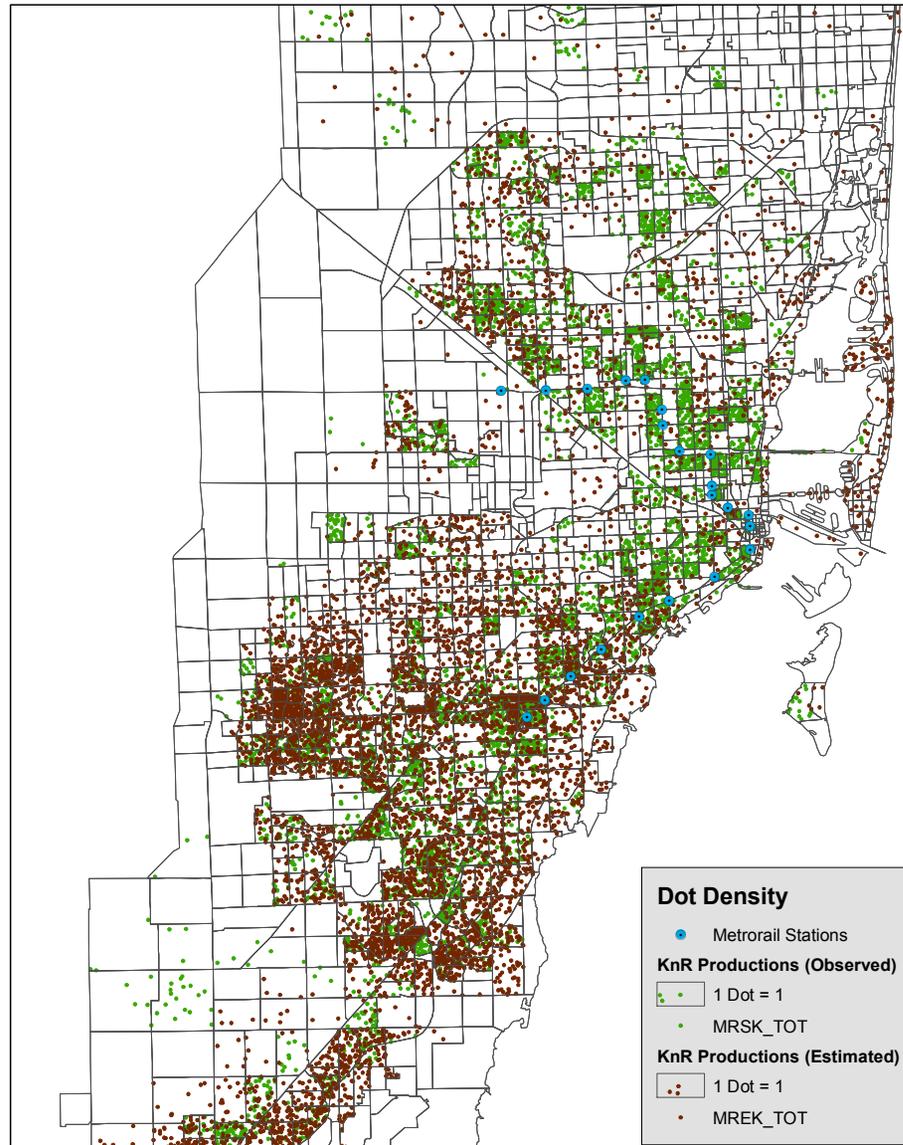




Table E-1: I-95 Express Bus Survey District-to-District Linked Trips (I-95X buses only, includes school and university trips)

Production District	Attraction District															Total	Total %		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
1 - Jupiter and West Palm Beach	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 - West Palm Beach CBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 - Palm Springs and Boca	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
4 - West Palm Beach County	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	7
5 - North and West Broward County	0	0	0	0	0	0	0	0	0	3	26	0	0	0	0	0	0	0	29
6 - Fort Lauderdale	0	0	0	0	0	0	0	0	0	0	0	0	9	3	0	0	0	0	13
7 - Fort Lauderdale CBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - South Broward County	0	0	0	0	0	0	0	34	35	172	100	0	45	37	0	0	0	0	426
9 - North Miami-Dade County	0	0	0	0	0	0	0	0	49	553	595	16	59	80	42	0	0	0	1,395
10 - Miami CBD Fringe	0	0	0	0	0	0	0	0	0	0	0	10	0	3	0	0	0	0	13
11 - Miami CBD	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	20
12 - Miami Beach	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 - Hospital District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 - South Miami-Dade County	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 - West Miami-Dade County	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	34	84	748	731	26	114	123	46	0	0	0	1,905
Total %	0%	0%	0%	0%	0%	0%	0%	2%	4%	39%	38%	1%	6%	6%	2%	0%	0%	0%	100%
Flows into Miami-Dade county	1,871																		*I-95 X only
% Flows into Miami-Dade county	98%																		

Table E-2: I-95 Express Bus Estimated District-to-District Linked Trips (I-95X buses only, includes school and university trips)

Production District	Attraction District															Total	Total %		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
1 - Jupiter and West Palm Beach	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 - West Palm Beach CBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 - Palm Springs and Boca	0	0	0	0	0	0	0	0	1	3	10	0	0	0	0	0	0	0	13
4 - West Palm Beach County	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
5 - North and West Broward County	0	0	0	0	0	0	0	0	3	8	30	0	14	1	1	0	0	0	57
6 - Fort Lauderdale	0	0	0	0	0	0	0	0	1	2	1	0	1	0	0	0	0	0	4
7 - Fort Lauderdale CBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - South Broward County	0	0	0	0	0	0	0	0	7	50	291	2	299	23	7	0	0	0	679
9 - North Miami-Dade County	0	0	2	0	9	2	0	30	13	145	1,203	2	564	32	32	0	0	0	2,035
10 - Miami CBD Fringe	0	143	3	0	22	1	0	11	17	41	2	0	5	0	3	0	0	0	249
11 - Miami CBD	0	0	0	0	0	0	0	0	10	45	0	0	0	0	0	0	0	0	56
12 - Miami Beach	0	0	4	0	6	1	0	6	3	3	2	0	3	0	0	0	0	0	28
13 - Hospital District	0	0	0	0	0	0	0	1	1	6	0	0	33	0	0	0	0	0	42
14 - South Miami-Dade County	0	0	0	0	0	0	0	0	6	25	0	0	0	0	1	0	0	0	32
15 - West Miami-Dade County	0	0	0	0	4	0	0	4	9	78	23	0	2	0	3	0	0	0	122
Total	0	143	8	0	41	4	1	53	71	405	1,563	5	921	56	48	0	0	0	3,319
Total %	0%	4%	0%	0%	1%	0%	0%	2%	2%	12%	47%	0%	28%	2%	1%	0%	0%	0%	100%
Flows into Miami-Dade county	3,068																		
% Flows into Miami-Dade county	92%																		



Table E-3: I-95 Express Bus Survey District-to-District Linked Trips
(95E Inter-county buses only, includes school and university trips)

Production District	Attraction District															Total	Total %	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
1 - Jupiter and West Palm Beach	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	0%
2 - West Palm Beach CBD	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	0%
3 - Palm Springs and Boca	0	0	0	0	0	0	0	0	0	3	17	0	0	3	4	28	3%	
4 - West Palm Beach County	0	0	0	0	0	5	0	0	0	5	18	0	2	2	0	31	3%	
5 - North and West Broward County	0	0	0	0	3	3	0	2	2	58	163	3	58	14	2	307	29%	
6 - Fort Lauderdale	0	0	0	0	0	0	0	0	5	45	39	3	15	18	5	129	12%	
7 - Fort Lauderdale CBD	0	0	0	0	0	0	0	0	0	11	14	0	2	3	0	30	3%	
8 - South Broward County	0	0	0	0	0	0	0	16	19	109	269	5	59	17	27	521	49%	
9 - North Miami-Dade County	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	6	1%	
10 - Miami CBD Fringe	0	0	0	0	0	0	0	0	0	0	2	0	0	3	0	5	0%	
11 - Miami CBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	
12 - Miami Beach	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	
13 - Hospital District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	
14 - South Miami-Dade County	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0%	
15 - West Miami-Dade County	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	
Total	2	0	0	0	3	8	0	18	25	230	531	11	136	63	38	1,066	100%	
Total %	0%	0%	0%	0%	0%	1%	0%	2%	2%	22%	50%	1%	13%	6%	4%	100%		
Flows into Miami-Dade county	1,035																*I-95 E only	
% Flows into Miami-Dade county	97%																	

Table E-4: I-95 Express Bus Estimated District-to-District Linked Trips
(95E Inter-county buses only, includes school and university trips)

Production District	Attraction District															Total	Total %	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
1 - Jupiter and West Palm Beach	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
2 - West Palm Beach CBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
3 - Palm Springs and Boca	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4	0%	
4 - West Palm Beach County	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0%	
5 - North and West Broward County	0	0	0	0	0	0	0	3	6	25	141	15	47	25	15	277	8%	
6 - Fort Lauderdale	0	0	0	0	0	0	0	0	2	15	61	7	22	10	11	128	4%	
7 - Fort Lauderdale CBD	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	4	0%	
8 - South Broward County	0	0	1	0	7	1	1	32	6	43	572	22	112	56	41	893	27%	
9 - North Miami-Dade County	0	0	0	0	5	19	2	28	0	0	0	0	0	0	0	54	2%	
10 - Miami CBD Fringe	32	15	4	1	99	75	8	75	0	0	0	0	0	0	0	310	9%	
11 - Miami CBD	0	0	0	0	5	5	1	10	0	0	0	0	0	0	0	22	1%	
12 - Miami Beach	0	0	1	0	23	4	0	8	0	0	0	0	0	0	0	36	1%	
13 - Hospital District	0	0	0	0	1	15	0	2	0	0	0	0	0	0	0	18	1%	
14 - South Miami-Dade County	0	0	0	0	11	17	5	19	0	0	0	0	0	0	0	52	2%	
15 - West Miami-Dade County	0	0	0	0	75	124	5	136	0	0	0	0	0	0	0	341	10%	
Total	32	16	7	1	227	260	23	319	14	83	776	44	181	91	68	2,141	65%	
Total %	1%	0%	0%	0%	7%	8%	1%	10%	0%	3%	23%	1%	5%	3%	2%	65%		
Flows into Miami-Dade county	1,257																	
% Flows into Miami-Dade county	59%																	



Table T-3: Tri-Rail Observed Station-to-Station Trips - Walk Access

Walk Access (Survey)	Attraction Station																		Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Production Station	0	0	2	2	7	0	0	0	0	7	7	0	0	0	0	11	0	0	35	1%	0	0%	35	3%
1-Mangonia Park	0	0	0	11	13	9	0	20	16	4	14	7	0	0	0	11	0	0	105	4%	0	0%	105	9%
2-West Palm Beach	12	59	0	0	38	42	5	0	15	5	0	5	0	0	4	0	0	188	7%	71	5%	117	10%	
3-Lake Worth	17	0	0	0	0	0	0	37	4	6	12	0	8	0	7	0	0	92	4%	17	1%	74	6%	
4-Boynton Beach	5	0	0	0	0	0	0	0	6	5	14	0	0	0	0	0	0	31	1%	5	0%	26	2%	
5-Delray Beach	0	0	0	0	0	0	0	0	11	25	5	0	21	0	0	0	0	64	3%	0	0%	64	5%	
6-Boca Raton	0	10	50	0	7	0	0	0	23	0	17	0	2	0	0	11	0	136	5%	67	5%	69	6%	
7-Deerfield Beach	0	11	7	13	3	29	0	0	0	7	0	0	0	0	25	0	0	121	5%	63	5%	58	5%	
8-Pompano Beach	0	4	8	7	0	76	0	0	0	0	24	0	53	0	22	55	0	166	11%	95	7%	171	14%	
9-Cypress Creek	5	0	0	0	4	37	2	6	0	0	0	0	0	11	0	57	0	122	5%	54	4%	68	6%	
10-Fort Lauderdale	5	6	0	0	0	30	11	18	25	0	0	0	0	0	34	0	0	164	7%	96	7%	68	6%	
11-Fort Lauderdale Airport	0	0	0	7	0	0	14	8	0	0	0	0	0	3	0	30	0	90	4%	29	2%	61	5%	
12-Sheridan Street	0	0	0	0	12	8	15	33	18	9	9	0	0	0	10	82	23	264	11%	104	8%	160	13%	
13-Hollywood	0	11	0	14	0	15	0	24	41	48	15	0	0	0	0	0	0	35	203	8%	167	13%	35	3%
14-Golden Glades	0	4	0	0	0	13	5	0	0	0	17	10	0	0	0	0	0	37	87	3%	50	4%	37	3%
15-Opa-locka	6	12	0	0	0	21	10	28	78	27	41	45	65	63	0	0	0	439	17%	396	30%	43	4%	
16-Metrorail	0	0	0	0	0	0	0	0	11	0	0	10	0	3	0	0	0	24	1%	24	2%	0	0%	
17-Hialeah Market	0	0	0	0	4	7	0	0	8	0	33	0	18	0	11	0	0	81	3%	81	6%	0	0%	
18-Miami Airport	50	117	66	53	89	287	62	173	256	143	208	78	167	80	44	328	23	288	2,513	100%	1,321	100%	1,192	100%
Total	2%	5%	3%	2%	4%	11%	2%	7%	10%	6%	8%	3%	7%	3%	2%	13%	1%	11%	100%					
NB Total	50	117	64	41	31	236	57	116	182	84	115	66	83	66	11	0	0	1,321	53%	No. of Stations Traveled	1	59	2%	
NB %	4%	9%	5%	3%	2%	18%	4%	9%	14%	6%	9%	5%	6%	5%	1%	0%	0%	100%			2	313	12%	
SB Total	0	0	2	12	58	51	5	57	74	59	93	12	84	14	33	328	23	288	47%		3	417	17%	
SB %	0%	0%	0%	1%	5%	4%	0%	5%	6%	5%	8%	1%	7%	1%	3%	27%	2%	24%	100%	3+	1,723	69%		

Table T-4: Tri-Rail Estimated Station-to-Station Trips - Walk Access

Walk Access (Model Estimates)	Attraction Station																		Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Production Station	0	9	2	4	9	6	1	0	1	1	0	0	0	0	1	0	1	36	1%	0	0%	36	4%	
1-Mangonia Park	6	0	7	5	9	26	5	4	5	5	2	1	1	3	0	5	0	87	2%	6	0%	81	8%	
2-West Palm Beach	9	18	1	7	13	17	7	13	9	10	2	0	1	1	0	3	0	112	3%	28	1%	84	9%	
3-Lake Worth	3	6	3	0	7	9	5	5	5	3	2	0	0	1	0	1	0	52	1%	12	0%	39	4%	
4-Boynton Beach	4	8	6	11	1	34	16	13	13	8	3	2	2	2	1	4	0	131	4%	30	1%	101	10%	
5-Delray Beach	0	2	2	3	16	3	27	22	14	6	2	1	1	1	0	4	0	105	3%	26	1%	79	8%	
6-Boca Raton	1	47	6	13	21	116	2	31	23	9	10	2	2	0	5	0	2	292	8%	205	8%	87	9%	
7-Deerfield Beach	2	4	2	3	18	79	50	1	37	15	12	3	4	2	1	7	0	241	7%	157	6%	83	8%	
8-Pompano Beach	1	2	1	2	14	47	18	36	5	14	14	8	5	3	2	14	0	191	5%	126	5%	65	7%	
9-Cypress Creek	4	57	1	4	21	64	34	25	66	0	31	11	5	3	4	22	1	361	10%	277	11%	85	9%	
10-Fort Lauderdale	0	1	0	2	3	11	15	17	36	20	1	22	8	6	5	28	1	184	5%	105	4%	79	8%	
11-Fort Lauderdale Airport	0	7	0	0	1	5	6	9	22	9	17	0	9	6	5	27	1	129	4%	77	3%	52	5%	
12-Sheridan Street	0	0	0	1	2	5	15	7	18	5	16	7	0	3	5	29	3	129	4%	76	3%	53	5%	
13-Hollywood	1	155	6	2	9	30	30	23	72	22	42	14	4	0	2	4	1	425	12%	413	16%	13	1%	
14-Golden Glades	0	0	0	1	4	6	4	13	32	16	29	9	13	3	0	28	4	168	5%	131	5%	37	4%	
15-Opa-locka	0	58	29	11	10	49	79	53	128	104	94	42	32	2	7	0	2	711	20%	700	28%	11	1%	
16-Metrorail	0	0	0	0	0	0	0	1	2	2	2	0	3	1	2	11	0	25	1%	24	1%	2	0%	
17-Hialeah Market	0	12	1	0	0	1	1	3	9	14	19	9	15	1	5	16	1	109	3%	109	4%	0	0%	
18-Miami Airport	32	386	70	66	158	508	317	277	498	265	300	133	105	40	39	212	16	69	3,490	100%	2,503	100%	987	100%
Total	1%	11%	2%	2%	5%	15%	9%	8%	14%	8%	9%	4%	3%	1%	1%	6%	0%	2%	100%					
NB Total	32	377	59	51	120	413	254	187	386	193	219	82	67	7	13	27	1	0	2,489	71%	No. of Stations Traveled	1	664	19%
NB %	1%	15%	2%	2%	5%	17%	10%	8%	15%	8%	9%	3%	3%	0%	1%	1%	0%	0%	100%			2	440	13%
SB Total	0	9	11	15	38	95	64	89	113	72	81	51	37	33	26	184	14	69	1,001	29%		3	401	11%
SB %	0%	1%	1%	1%	4%	10%	6%	9%	11%	7%	8%	5%	4%	3%	3%	18%	1%	7%	100%		3+	1,984	57%	



Table T-5: Tri-Rail Observed Station-to-Station Trips - PNR Access

PNR Access (Survey)	Attraction Station																		Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Production Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
1-Mangonia Park	0	2	2	0	44	56	38	20	53	41	10	10	7	10	15	46	9	14	376	7%	0	0%	376	11%
2-West Palm Beach	0	0	0	0	7	16	12	21	12	8	4	8	0	0	8	23	0	15	133	2%	0	0%	133	4%
3-Lake Worth	0	25	0	0	0	17	22	27	68	68	20	10	10	5	0	74	51	46	443	8%	25	1%	418	13%
4-Boynton Beach	15	21	0	0	0	28	40	12	64	53	118	9	14	6	0	30	9	19	437	8%	36	2%	401	12%
5-Delray Beach	24	59	13	0	0	0	0	0	48	22	8	20	9	0	0	54	0	12	269	5%	96	5%	173	5%
6-Boca Raton	50	35	0	0	0	0	0	0	28	20	0	7	8	15	0	63	0	15	241	5%	86	4%	155	5%
7-Deerfield Beach	2	67	0	0	0	0	0	0	7	45	18	24	7	14	9	55	17	79	344	6%	68	3%	276	8%
8-Pompano Beach	16	37	21	0	27	22	0	0	0	20	14	9	0	4	12	85	0	63	331	6%	123	6%	208	6%
9-Cypress Creek	33	47	0	3	12	40	9	0	0	0	4	22	0	9	0	113	26	27	344	6%	144	7%	201	6%
10-Fort Lauderdale	51	20	14	9	30	57	9	3	0	0	0	0	13	10	0	184	9	47	456	9%	193	10%	263	8%
11-Fort Lauderdale Airport	9	39	0	0	0	25	25	11	20	0	0	0	0	14	0	124	21	79	367	7%	129	6%	238	7%
12-Sheridan Street	35	28	12	10	0	98	46	61	35	10	0	0	6	6	0	204	9	56	616	12%	336	17%	280	8%
13-Hollywood	13	14	0	10	0	10	38	10	11	10	0	0	0	0	0	47	10	44	217	4%	116	6%	101	3%
14-Golden Glades	0	20	14	0	14	9	19	37	59	24	0	0	0	0	0	31	0	41	267	5%	196	10%	71	2%
15-Opa-locka	20	0	0	0	0	12	0	0	35	18	0	6	0	0	0	6	0	17	114	2%	90	4%	24	1%
16-Metrorail	0	5	0	0	0	9	0	7	0	5	13	3	0	0	0	0	0	8	49	1%	42	2%	8	0%
17-Hialeah Market	0	14	0	0	0	44	13	16	64	10	0	0	0	0	0	0	0	0	161	3%	161	8%	0	0%
18-Miami Airport	7	20	14	0	0	27	17	8	26	2	32	0	19	0	0	0	0	0	171	3%	171	9%	0	0%
Total	276	453	91	31	134	469	289	232	528	355	241	128	92	92	44	1,139	161	584	5,338	100%	2,012	100%	3,326	100%
Total %	5%	8%	2%	1%	3%	9%	5%	4%	10%	7%	5%	2%	2%	2%	1%	21%	3%	11%	100%					
NB Total	276	451	89	31	83	352	177	153	249	78	45	9	19	0	0	0	0	0	2,012	38%	No. of Stations Traveled	1	39	1%
NB %	14%	22%	4%	2%	4%	18%	9%	8%	12%	4%	2%	0%	1%	0%	0%	0%	0%	0%	100%			2	202	4%
SB Total	0	2	2	0	51	116	112	79	279	277	196	119	73	92	44	1,139	161	584	3,326	62%		3	477	9%
SB %	0%	0%	0%	0%	2%	3%	3%	2%	8%	8%	6%	4%	2%	3%	1%	34%	5%	18%	100%			3+	4,620	87%

Table T-6: Tri-Rail Estimated Station-to-Station Trips - PNR Access

PNR Access (Model Estimates)	Attraction Station																		Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Production Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
1-Mangonia Park	0	60	12	11	39	73	39	29	49	33	25	7	6	12	4	56	2	20	477	9%	0	0%	476	12%
2-West Palm Beach	18	0	11	4	18	31	17	19	19	20	7	5	4	4	2	29	5	7	221	4%	18	1%	203	5%
3-Lake Worth	11	52	0	16	35	84	54	65	82	59	42	15	13	11	7	63	7	28	643	12%	63	5%	580	15%
4-Boynton Beach	6	20	16	0	30	52	51	66	84	66	46	22	15	10	7	45	11	23	567	11%	42	3%	526	14%
5-Delray Beach	4	11	3	8	0	28	22	36	47	35	20	16	15	11	8	38	5	41	346	7%	25	2%	321	8%
6-Boca Raton	6	17	3	2	14	0	19	18	42	37	15	13	10	8	8	40	5	19	278	5%	42	3%	236	6%
7-Deerfield Beach	4	15	4	2	4	23	0	25	32	42	21	16	10	12	8	55	5	29	306	6%	52	4%	254	7%
8-Pompano Beach	7	25	8	5	8	19	24	0	23	32	24	22	18	16	11	99	11	61	414	8%	96	7%	318	8%
9-Cypress Creek	4	18	7	4	7	14	10	11	0	7	10	10	8	8	8	90	7	39	262	5%	75	6%	187	5%
10-Fort Lauderdale	3	11	5	4	7	14	11	11	20	0	6	3	4	9	9	89	15	72	292	6%	86	7%	207	5%
11-Fort Lauderdale Airport	1	3	2	2	3	6	7	7	13	3	0	3	1	8	5	93	9	40	207	4%	47	4%	160	4%
12-Sheridan Street	3	8	3	4	7	18	16	21	39	9	23	0	1	4	4	60	7	39	268	5%	152	12%	116	3%
13-Hollywood	1	1	0	1	1	4	10	9	17	4	3	3	0	0	3	17	8	28	110	2%	53	4%	56	1%
14-Golden Glades	0	1	1	1	3	5	7	12	18	6	8	2	2	0	2	6	6	36	115	2%	64	5%	50	1%
15-Opa-locka	1	5	2	1	2	7	14	20	34	17	21	12	8	1	0	7	9	127	289	6%	145	11%	143	4%
16-Metrorail	0	3	1	1	2	6	10	18	33	19	18	8	9	2	5	0	0	16	150	3%	134	10%	16	0%
17-Hialeah Market	0	0	0	0	0	1	2	4	8	4	3	2	2	0	1	0	0	9	36	1%	27	2%	9	0%
18-Miami Airport	1	6	2	1	2	5	11	18	44	27	24	11	13	7	10	0	2	0	183	4%	183	14%	0	0%
Total	69	256	79	67	180	390	322	391	602	421	314	170	140	125	103	785	116	632	5,163	100%	1,305	100%	3,859	100%
Total %	1%	5%	2%	1%	3%	8%	6%	8%	12%	8%	6%	3%	3%	2%	2%	15%	2%	12%	100%					
NB Total	68	197	55	35	59	122	120	133	225	91	99	38	34	10	16	0	2	0	1,304	25%	No. of Stations Traveled	1	471	9%
NB %	5%	15%	4%	3%	5%	9%	9%	10%	17%	7%	8%	3%	3%	1%	1%	0%	0%	0%	100%			2	377	7%
SB Total	0	60	23	32	121	268	202	258	377	330	216	132	106	116	88	785	114	632	3,859	75%		3	628	12%
SB %	0%	2%	1%	1%	3%	7%	5%	7%	10%	9%	6%	3%	3%	3%	2%	20%	3%	16%	100%			3+	3,687	71%



Table T-7: Tri-Rail Observed Station-to-Station Trips - KNR Access

KNR Access (Survey)	Attraction Station																		Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Production Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
1-Mangonia Park	0	0	5	0	4	32	19	9	19	53	18	0	0	6	0	3	0	3	172	9%	0	0%	172	14%
2-West Palm Beach	0	0	0	19	10	44	4	0	6	4	0	0	0	19	4	8	0	16	134	7%	0	0%	134	11%
3-Lake Worth	0	11	0	0	0	15	0	26	22	0	5	0	0	10	0	24	0	35	148	8%	11	2%	137	12%
4-Boynton Beach	13	24	0	0	0	19	7	0	18	6	0	0	6	0	0	11	0	11	116	6%	37	5%	78	7%
5-Delray Beach	0	12	13	0	0	0	14	7	7	0	11	11	21	0	0	7	0	18	121	6%	25	3%	96	8%
6-Boca Raton	0	0	0	0	0	0	0	9	6	0	5	9	0	0	0	4	0	20	53	3%	0	0%	53	4%
7-Deerfield Beach	0	10	0	0	0	10	0	0	0	0	13	0	7	0	0	53	0	13	106	6%	20	3%	86	7%
8-Pompano Beach	21	27	0	0	20	17	16	0	0	4	0	0	0	0	0	20	0	15	140	7%	101	14%	38	3%
9-Cypress Creek	13	6	0	0	11	11	21	0	0	0	16	0	0	8	0	48	0	8	140	7%	61	8%	80	7%
10-Fort Lauderdale	36	20	0	0	0	16	13	0	0	0	0	0	28	0	0	41	0	38	193	10%	85	12%	108	9%
11-Fort Lauderdale Airport	0	0	0	0	6	0	8	0	11	0	0	0	0	0	0	48	0	4	77	4%	25	3%	52	4%
12-Sheridan Street	8	4	13	0	0	8	10	0	27	0	0	0	0	0	0	30	0	24	123	6%	69	10%	54	5%
13-Hollywood	19	18	16	0	0	10	0	0	9	0	0	0	0	0	0	37	0	49	158	8%	72	10%	86	7%
14-Golden Glades	0	0	0	0	0	0	25	0	9	0	0	0	0	0	0	5	0	40	40	2%	34	5%	5	0%
15-Opa-locka	10	5	0	0	12	4	0	0	6	0	9	0	0	0	0	0	0	45	45	2%	45	6%	0	0%
16-Metrorail	0	1	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	9	37	2%	28	4%	9	1%
17-Hialeah Market	0	0	12	0	0	6	0	9	5	0	0	0	0	0	0	0	0	0	32	2%	32	4%	0	0%
18-Miami Airport	0	21	0	0	0	9	0	5	8	20	0	15	0	0	0	0	0	79	79	4%	79	11%	0	0%
Total	121	159	58	19	62	199	138	65	154	87	76	35	61	70	4	335	5	263	1,912	100%	725	100%	1,187	100%
Total %	6%	8%	3%	1%	3%	10%	7%	3%	8%	5%	4%	2%	3%	4%	0%	18%	0%	14%	100%					
NB Total	121	159	53	0	48	89	94	14	76	20	9	15	0	27	0	0	0	0	725	38%	No. of Stations Traveled	1	37	2%
NB %	17%	22%	7%	0%	7%	12%	13%	2%	10%	3%	1%	2%	0%	4%	0%	0%	0%	0%	100%			2	208	11%
SB Total	0	0	5	19	14	110	44	51	78	66	67	19	61	43	4	335	5	263	1,187	62%	3	212	11%	
SB %	0%	0%	0%	2%	1%	9%	4%	4%	7%	6%	6%	2%	5%	4%	0%	28%	0%	22%	100%		3+	1,455	76%	

Table T-8: Tri-Rail Estimated Station-to-Station Trips - KNR Access

KNR Access (Model Estimates)	Attraction Station																		Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Production Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
1-Mangonia Park	0	2	1	1	13	21	9	8	11	8	5	0	1	3	1	11	1	4	100	4%	0	0%	100	8%
2-West Palm Beach	1	0	0	1	7	18	8	8	8	10	3	2	2	2	1	13	2	5	91	4%	1	0%	90	7%
3-Lake Worth	3	8	0	1	10	36	21	33	40	32	19	7	7	4	3	30	3	12	268	10%	10	1%	258	19%
4-Boynton Beach	2	4	1	0	4	15	16	27	35	29	18	8	5	4	3	24	3	6	204	8%	6	1%	198	15%
5-Delray Beach	1	3	0	0	0	4	4	12	19	14	8	6	5	4	3	18	2	11	115	4%	4	0%	110	8%
6-Boca Raton	2	5	1	0	2	0	1	3	11	12	6	5	3	3	3	17	2	6	82	3%	10	1%	72	5%
7-Deerfield Beach	2	20	2	1	1	4	0	2	6	10	8	5	3	3	3	26	2	9	108	4%	30	2%	78	6%
8-Pompano Beach	3	11	3	2	3	5	3	0	2	5	7	6	6	5	4	46	4	20	136	5%	31	2%	105	8%
9-Cypress Creek	3	43	3	2	6	11	4	2	0	1	3	3	2	2	3	43	3	13	147	6%	75	6%	72	5%
10-Fort Lauderdale	4	13	2	2	4	15	6	4	4	0	1	0	0	1	3	40	6	22	128	5%	55	4%	74	6%
11-Fort Lauderdale Airport	1	1	1	1	1	4	4	3	5	1	0	1	0	1	1	46	3	15	89	3%	22	2%	67	5%
12-Sheridan Street	1	26	2	5	9	37	15	13	21	2	4	0	0	0	1	21	2	10	169	7%	134	11%	35	3%
13-Hollywood	0	1	0	0	1	4	9	6	7	2	1	1	0	0	0	5	2	7	47	2%	32	3%	15	1%
14-Golden Glades	0	6	4	2	16	21	20	31	35	5	9	2	1	0	0	1	2	10	165	6%	153	12%	13	1%
15-Opa-locka	1	3	16	1	5	14	29	15	38	15	12	6	4	0	0	5	3	31	198	8%	160	13%	39	3%
16-Metrorail	0	1	2	1	4	29	18	24	46	23	15	7	7	1	2	0	0	1	182	7%	181	15%	1	0%
17-Hialeah Market	0	26	0	0	1	3	6	15	11	3	3	1	1	0	0	0	0	0	69	3%	69	6%	0	0%
18-Miami Airport	0	51	14	3	3	8	15	20	47	47	33	13	7	3	3	0	0	0	265	10%	265	21%	0	0%
Total	24	225	52	24	90	250	189	225	346	219	155	72	55	36	34	347	40	181	2,563	100%	1,238	100%	1,325	100%
Total %	1%	9%	2%	1%	3%	10%	7%	9%	13%	9%	6%	3%	2%	1%	1%	14%	2%	7%	100%					
NB Total	24	223	50	20	56	156	129	132	214	98	76	29	20	4	6	0	0	0	1,238	48%	No. of Stations Traveled	1	60	2%
NB %	2%	18%	4%	2%	5%	13%	10%	11%	17%	8%	6%	2%	2%	0%	0%	0%	0%	0%	100%			2	89	3%
SB Total	0	2	1	4	33	94	60	93	132	121	79	43	35	32	28	347	40	181	1,325	52%	3	220	9%	
SB %	0%	0%	0%	0%	3%	7%	5%	7%	10%	9%	6%	3%	3%	2%	2%	26%	3%	14%	100%		3+	2,194	86%	



Table T-9: Tri-Rail Observed Station-to-Station Trips (HBW Trips only) - Walk Access

Walk Access (Survey)	Attraction Station																		Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Production Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	16	1%	0	0%	16	2%
1-Mangonia Park	0	0	2	0	7	0	0	0	0	7	0	0	0	0	0	0	0	0	16	1%	0	0%	16	2%
2-West Palm Beach	0	0	0	11	12	9	0	20	16	3	14	0	0	0	0	11	0	0	96	5%	0	0%	96	11%
3-Lake Worth	4	56	0	0	38	36	5	0	15	5	0	0	0	0	0	4	0	5	166	8%	59	5%	107	12%
4-Boynton Beach	17	0	0	0	0	0	0	37	4	0	7	0	8	0	0	0	0	0	73	4%	17	2%	55	6%
5-Delray Beach	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	6	0%	0	0%	6	1%
6-Boca Raton	0	0	0	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	42	2%	0	0%	42	5%
7-Deerfield Beach	0	10	50	0	7	0	0	23	0	17	0	2	0	0	11	0	16	136	7%	67	6%	69	8%	
8-Pompano Beach	0	11	0	13	3	29	0	0	0	7	0	0	0	0	25	0	15	103	5%	56	5%	47	5%	
9-Cypress Creek	0	4	8	7	0	76	0	0	0	18	0	53	0	17	38	0	12	234	12%	95	9%	138	16%	
10-Fort Lauderdale	0	0	0	0	0	35	0	6	0	0	0	0	0	11	0	31	0	84	4%	41	4%	43	5%	
11-Fort Lauderdale Airport	0	0	0	0	0	22	11	18	25	0	0	0	0	0	0	9	0	161	5%	76	7%	25	3%	
12-Sheridan Street	0	0	0	7	0	0	14	8	0	0	0	0	0	0	0	19	0	48	2%	29	3%	19	2%	
13-Hollywood	0	0	0	0	12	8	15	33	18	9	9	0	0	0	10	76	23	40	254	13%	104	9%	149	17%
14-Golden Glades	0	11	0	0	0	0	0	24	41	48	15	0	0	0	0	0	0	35	174	9%	139	12%	35	4%
15-Opa-locka	0	0	0	0	0	13	0	0	0	0	17	10	0	0	0	0	0	17	58	3%	41	4%	17	2%
16-Metrorail	6	6	0	0	0	15	10	28	68	4	41	39	59	63	0	0	0	8	347	17%	339	30%	8	1%
17-Hialeah Market	0	0	0	0	0	0	0	0	11	0	0	10	0	0	0	0	0	0	22	1%	22	2%	0	0%
18-Miami Airport	0	0	0	0	0	7	0	0	8	0	0	0	12	0	0	0	0	0	27	1%	27	2%	0	0%
Total	27	96	59	38	79	251	55	173	236	104	137	60	155	74	28	225	23	164	1,985	100%	1,113	100%	873	100%
Total %	1%	5%	3%	2%	4%	13%	3%	9%	12%	5%	7%	3%	8%	4%	1%	11%	1%	8%	100%					
NB Total	27	96	57	27	23	206	50	116	172	62	82	60	71	63	0	0	0	1,113	56%	No. of Stations Traveled	1	56	3%	
NB %	2%	9%	5%	2%	2%	19%	5%	10%	15%	6%	7%	5%	6%	6%	0%	0%	0%	100%	44%		2	261	13%	
SB Total	0	0	2	11	57	45	5	57	64	43	55	0	84	11	28	225	23	164	873		3	351	18%	
SB %	0%	0%	0%	1%	7%	5%	1%	7%	7%	5%	6%	0%	10%	1%	3%	26%	3%	19%	100%		3+	1,318	66%	

Table T-10: Tri-Rail Estimated Station-to-Station Trips (HBW Trips only) - Walk Access

Walk Access (Model Estimates)	Attraction Station																		Total	Total %	NB Total	NB %	SB Total	SB %	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18							
Production Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	26	1%	0	0%	26	5%	
1-Mangonia Park	0	5	1	3	8	5	1	0	0	1	0	0	0	0	0	1	0	1	26	1%	0	0%	26	5%	
2-West Palm Beach	0	0	1	1	5	22	2	1	2	2	1	0	0	3	0	5	0	1	48	2%	0	0%	48	9%	
3-Lake Worth	5	5	0	1	5	8	2	8	5	8	2	0	1	1	0	3	0	1	53	3%	10	1%	43	8%	
4-Boynton Beach	2	3	1	0	3	4	2	2	3	2	2	0	0	1	0	1	0	0	25	1%	6	0%	18	4%	
5-Delray Beach	4	6	3	5	0	10	6	4	7	3	1	1	1	1	1	4	0	2	59	3%	18	1%	40	8%	
6-Boca Raton	0	1	0	0	0	3	0	5	7	6	2	1	0	0	0	3	0	1	29	1%	4	0%	25	5%	
7-Deerfield Beach	0	46	5	10	8	70	0	10	13	5	8	1	1	1	0	4	0	2	185	9%	140	9%	45	9%	
8-Pompano Beach	2	4	1	1	9	51	28	0	18	10	9	2	3	2	0	6	0	2	147	7%	94	6%	53	10%	
9-Cypress Creek	1	1	1	1	6	26	9	17	1	5	7	4	3	1	1	10	0	3	97	5%	64	4%	34	6%	
10-Fort Lauderdale	4	56	1	3	9	36	23	13	41	0	13	5	2	1	1	15	1	6	230	11%	186	12%	45	9%	
11-Fort Lauderdale Airport	0	0	0	1	0	2	5	10	18	6	0	5	3	1	2	20	1	7	81	4%	43	3%	38	7%	
12-Sheridan Street	0	7	0	0	0	0	2	5	11	3	7	0	6	2	2	20	0	4	71	3%	35	2%	35	7%	
13-Hollywood	0	0	0	1	0	1	12	4	11	2	6	3	0	0	1	2	20	2	10	76	4%	41	3%	35	7%
14-Golden Glades	1	155	6	1	1	10	17	10	38	11	15	6	0	0	1	2	1	4	279	14%	270	18%	9	2%	
15-Opa-locka	0	0	0	0	2	0	0	6	16	2	8	2	4	1	0	19	2	3	65	3%	41	3%	24	5%	
16-Metrorail	0	58	29	10	4	30	65	34	88	76	52	26	15	1	2	0	1	3	494	24%	491	32%	3	1%	
17-Hialeah Market	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	5	0	0	10	0%	9	1%	0	0%	
18-Miami Airport	0	12	1	0	0	0	0	2	5	9	15	6	6	0	1	3	0	0	60	3%	60	4%	0	0%	
Total	20	358	49	39	62	275	180	132	284	149	146	61	48	16	14	141	10	50	2,034	100%	1,512	100%	522	100%	
Total %	1%	18%	2%	2%	3%	14%	9%	6%	14%	7%	7%	3%	2%	1%	1%	7%	0%	2%	100%						
NB Total	20	353	47	34	42	225	162	100	229	110	102	42	28	2	4	8	0	0	1,509	74%	No. of Stations Traveled	1	296	15%	
NB %	1%	23%	3%	2%	3%	15%	11%	7%	15%	7%	7%	3%	2%	0%	0%	1%	0%	0%	100%	26%		2	207	10%	
SB Total	0	5	2	5	20	50	18	32	55	38	44	19	20	15	11	133	10	50	525	26%		3	207	10%	
SB %	0%	1%	0%	1%	4%	10%	3%	6%	10%	7%	8%	4%	4%	3%	2%	25%	2%	9%	100%	3+		1,325	65%		



Table T-11: Tri-Rail Observed Station-to-Station Trips (HBW Trips only) - PNR Access

PNR Access (Survey)	Attraction Station																		Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Production Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
1-Mangonia Park	0	2	0	0	44	55	38	20	52	41	6	8	0	10	15	38	9	14	350	7%	0	0%	350	12%
2-West Palm Beach	0	0	0	0	7	16	12	21	12	8	0	8	0	0	8	23	0	2	116	2%	0	0%	116	4%
3-Lake Worth	0	25	0	0	0	17	22	27	68	64	20	10	10	5	0	37	45	17	366	8%	25	1%	341	12%
4-Boynton Beach	15	21	0	0	0	28	40	12	64	53	69	9	14	0	0	30	9	10	372	8%	36	2%	336	12%
5-Delray Beach	24	59	13	0	0	0	0	0	48	22	8	20	9	0	0	25	0	8	236	5%	96	5%	140	5%
6-Boca Raton	50	35	0	0	0	0	0	0	28	13	0	7	5	15	0	63	0	15	232	5%	86	4%	146	5%
7-Deerfield Beach	2	65	0	0	0	0	0	0	7	43	18	24	7	14	9	55	15	42	302	6%	67	3%	235	8%
8-Pompano Beach	16	37	21	0	14	22	0	0	0	20	10	9	0	4	12	85	0	47	297	6%	110	6%	187	7%
9-Cypress Creek	33	47	0	3	12	40	9	0	0	0	0	22	0	9	0	113	26	16	329	7%	144	7%	186	7%
10-Fort Lauderdale	51	20	14	6	30	57	9	3	0	0	0	0	13	10	0	158	9	22	403	8%	190	10%	213	7%
11-Fort Lauderdale Airport	9	32	0	0	0	25	25	11	20	0	0	0	0	14	0	124	21	50	331	7%	122	6%	209	7%
12-Sheridan Street	35	28	12	10	0	98	46	61	35	10	0	0	6	6	0	204	9	26	586	12%	336	17%	250	9%
13-Hollywood	13	14	0	10	0	10	25	10	11	10	0	0	0	0	0	47	10	23	183	4%	103	5%	80	3%
14-Golden Glades	0	20	14	0	14	9	19	37	59	24	0	0	0	0	0	31	0	16	243	5%	196	10%	47	2%
15-Opa-locka	20	0	0	0	0	12	0	0	35	18	0	6	0	0	0	6	0	0	96	2%	90	5%	6	0%
16-Metrorail	0	5	0	0	0	9	0	7	0	5	12	3	0	0	0	0	0	8	48	1%	41	2%	8	0%
17-Hialeah Market	0	14	0	0	0	37	13	16	64	10	0	0	0	0	0	0	0	0	155	3%	155	8%	0	0%
18-Miami Airport	7	20	12	0	0	27	17	6	20	2	32	0	19	0	0	0	0	0	162	3%	162	8%	0	0%
Total	276	445	87	29	120	461	276	230	521	342	175	126	82	86	44	1,040	153	314	4,806	100%	1,958	100%	2,849	100%
Total %	6%	9%	2%	1%	2%	10%	6%	5%	11%	7%	4%	3%	2%	2%	1%	22%	3%	7%	100%					
NB Total	276	443	87	29	69	346	164	151	243	78	44	9	19	0	0	0	0	0	1,958	41%	No. of Stations Traveled	1	39	1%
NB %	14%	23%	4%	1%	4%	18%	8%	8%	12%	4%	2%	0%	1%	0%	0%	0%	0%	0%	100%			2	197	4%
SB Total	0	2	0	0	51	115	112	79	278	264	131	117	64	86	44	1,040	153	314	2,849	59%		3	440	9%
SB %	0%	0%	0%	0%	2%	4%	4%	3%	10%	9%	5%	4%	2%	3%	2%	37%	5%	11%	100%			3+	4,131	86%

Table T-12: Tri-Rail Estimated Station-to-Station Trips (HBW Trips only) - PNR Access

PNR Access (Model Estimates)	Attraction Station																		Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Production Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
1-Mangonia Park	0	23	4	5	24	58	29	16	40	26	23	6	5	12	4	55	2	19	351	10%	0	0%	351	13%
2-West Palm Beach	2	0	1	1	9	22	9	8	9	12	4	3	3	4	1	28	5	7	129	4%	2	0%	126	5%
3-Lake Worth	6	20	0	2	15	52	34	42	58	38	33	9	10	8	5	61	7	27	429	12%	26	4%	403	15%
4-Boynton Beach	3	12	2	0	6	29	33	43	63	47	36	16	11	8	5	41	10	22	385	11%	17	2%	368	13%
5-Delray Beach	2	7	1	1	0	4	11	16	28	17	10	10	9	6	3	31	4	39	200	6%	10	1%	189	7%
6-Boca Raton	3	12	1	1	2	0	4	6	27	24	9	8	6	4	4	33	4	17	164	5%	18	3%	146	5%
7-Deerfield Beach	3	12	2	0	1	5	0	4	20	30	15	11	7	8	4	45	3	27	198	6%	23	3%	174	6%
8-Pompano Beach	5	16	4	3	3	10	7	0	10	25	19	18	15	12	6	82	10	56	298	9%	47	7%	251	9%
9-Cypress Creek	3	12	3	2	3	10	6	5	0	5	7	7	6	6	5	75	5	33	192	6%	43	6%	149	5%
10-Fort Lauderdale	2	7	2	2	3	9	8	7	12	0	2	2	3	7	4	69	12	64	215	6%	52	7%	163	6%
11-Fort Lauderdale Airport	1	2	1	1	0	3	3	4	8	1	0	0	0	6	2	79	6	34	149	4%	22	3%	127	5%
12-Sheridan Street	2	7	1	2	3	12	11	15	27	4	4	0	0	3	1	50	5	34	182	5%	88	12%	94	3%
13-Hollywood	1	1	0	0	1	3	8	8	13	2	1	0	0	0	1	11	6	24	80	2%	39	6%	42	2%
14-Golden Glades	0	1	1	0	1	1	4	7	10	2	2	0	0	0	0	4	5	32	70	2%	29	4%	41	1%
15-Opa-locka	1	4	2	0	0	3	10	13	23	8	9	5	3	0	0	6	7	110	205	6%	82	12%	123	4%
16-Metrorail	0	3	0	0	1	2	7	13	24	12	11	4	5	1	3	0	0	10	97	3%	87	12%	10	0%
17-Hialeah Market	0	0	0	0	0	0	0	3	5	1	1	1	0	0	0	0	0	5	17	0%	12	2%	5	0%
18-Miami Airport	1	5	1	0	1	2	6	9	30	16	15	6	6	4	6	0	1	0	110	3%	110	16%	0	0%
Total	35	144	27	20	73	223	191	216	407	272	200	107	89	90	54	669	92	561	3,470	100%	706	100%	2,764	100%
Total %	1%	4%	1%	1%	2%	6%	5%	6%	12%	8%	6%	3%	3%	3%	2%	19%	3%	16%	100%					
NB Total	35	121	22	12	19	59	70	81	152	47	43	16	14	5	9	0	1	0	706	20%	No. of Stations Traveled	1	137	4%
NB %	5%	17%	3%	2%	3%	8%	10%	12%	22%	7%	6%	2%	2%	1%	1%	0%	0%	0%	100%			2	207	6%
SB Total	0	23	6	8	53	164	120	135	255	225	157	91	75	85	45	669	91	561	2,764	80%		3	417	12%
SB %	0%	1%	0%	0%	2%	6%	4%	5%	9%	8%	6%	3%	3%	3%	2%	24%	3%	20%	100%			3+	2,709	78%



Table T-13: Tri-Rail Observed Station-to-Station Trips (HBW Trips only) - KNR Access

KNR Access (Survey)	Attraction Station																		Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Production Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
1-Mangonia Park	0	0	0	0	4	32	19	9	13	53	8	0	0	0	0	0	0	0	138	9%	0	0%	138	15%
2-West Palm Beach	0	0	0	19	10	44	4	0	0	0	0	0	0	15	4	4	0	0	100	6%	0	0%	100	11%
3-Lake Worth	0	11	0	0	0	15	0	26	22	0	0	0	0	10	0	13	0	21	118	8%	11	2%	107	12%
4-Boynton Beach	13	17	0	0	0	19	7	0	12	6	0	0	6	0	0	11	0	11	103	7%	31	5%	72	8%
5-Delray Beach	0	12	13	0	0	0	14	0	7	0	0	11	7	0	0	7	0	0	71	5%	25	4%	46	5%
6-Boca Raton	0	0	0	0	0	0	0	9	6	0	0	9	0	0	0	4	0	20	48	3%	0	0%	48	5%
7-Deerfield Beach	0	0	0	0	0	10	0	0	0	0	13	0	7	0	0	53	0	0	82	5%	10	2%	73	8%
8-Pompano Beach	14	23	0	0	20	17	16	0	0	0	0	0	0	0	0	20	0	0	110	7%	90	14%	20	2%
9-Cypress Creek	13	6	0	0	11	11	21	0	0	0	16	0	0	0	0	39	0	0	115	7%	61	10%	55	6%
10-Fort Lauderdale	36	20	0	0	0	16	0	0	0	0	0	0	28	0	0	41	0	28	169	11%	72	11%	97	11%
11-Fort Lauderdale Airport	0	0	0	0	6	0	8	0	11	0	0	0	0	0	0	48	0	0	73	5%	25	4%	48	5%
12-Sheridan Street	8	0	13	0	0	8	10	0	27	0	0	0	0	0	0	16	0	19	100	6%	65	10%	35	4%
13-Hollywood	19	18	16	0	0	10	0	0	9	0	0	0	0	0	0	37	0	32	141	9%	72	11%	69	8%
14-Golden Glades	0	0	0	0	0	0	25	0	9	0	0	0	0	0	0	0	0	0	34	2%	34	5%	0	0%
15-Opa-locka	10	0	0	0	12	4	0	0	6	0	9	0	0	0	0	0	0	0	40	3%	40	6%	0	0%
16-Metrorail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9	9	1%	0	0%	9	1%
17-Hialeah Market	0	0	12	0	0	6	0	9	5	0	0	0	0	0	0	0	0	0	32	2%	32	5%	0	0%
18-Miami Airport	0	21	0	0	0	9	0	5	8	15	0	5	0	0	0	0	0	0	63	4%	63	10%	0	0%
Total	114	127	53	19	62	199	125	58	136	74	46	25	48	25	4	294	0	140	1,549	100%	631	100%	918	100%
Total %	7%	8%	3%	1%	4%	13%	8%	4%	9%	5%	3%	2%	3%	2%	0%	19%	0%	9%	100%					
NB Total	114	127	53	0	48	89	81	14	76	15	9	5	0	0	0	0	0	0	631	41%	No. of Stations Traveled	1	37	2%
NB %	18%	20%	8%	0%	8%	14%	13%	2%	12%	2%	1%	0%	0%	0%	0%	0%	0%	0%	100%			2	165	11%
SB Total	0	0	0	19	14	110	44	44	60	59	37	19	48	25	4	294	0	140	918	59%		3	187	12%
SB %	0%	0%	0%	2%	2%	12%	5%	5%	7%	6%	4%	2%	5%	3%	0%	32%	0%	15%	100%		3+	1,160	75%	

Table T-14: Tri-Rail Estimated Station-to-Station Trips (HBW Trips only) - KNR Access

KNR Access (Model Estimates)	Attraction Station																		Total	Total %	NB Total	NB %	SB Total	SB %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Production Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
1-Mangonia Park	0	1	0	1	9	18	7	4	8	7	5	0	0	3	1	10	1	4	80	5%	0	0%	80	8%
2-West Palm Beach	0	0	0	0	4	13	5	3	4	7	2	1	1	2	1	13	2	5	64	4%	0	0%	64	7%
3-Lake Worth	1	3	0	0	4	21	12	20	28	23	15	5	6	3	3	30	3	12	188	11%	4	1%	184	19%
4-Boynton Beach	1	3	0	0	1	8	9	16	26	21	14	6	4	3	2	23	3	6	146	8%	4	1%	142	14%
5-Delray Beach	1	2	0	0	0	0	2	5	11	7	4	4	3	2	1	15	2	10	70	4%	3	0%	68	7%
6-Boca Raton	1	4	0	0	0	0	0	1	7	8	3	3	2	1	2	15	2	6	55	3%	6	1%	48	5%
7-Deerfield Beach	1	19	2	1	0	1	0	0	4	8	5	3	2	2	2	21	2	8	81	5%	24	3%	57	6%
8-Pompano Beach	3	9	2	1	1	3	1	0	1	4	5	5	5	3	2	39	4	19	106	6%	19	2%	87	9%
9-Cypress Creek	3	40	2	1	4	7	2	1	0	1	2	2	2	1	1	38	2	11	121	7%	60	8%	61	6%
10-Fort Lauderdale	4	11	1	1	2	12	4	2	2	0	1	0	0	1	1	32	5	19	97	5%	37	5%	59	6%
11-Fort Lauderdale Airport	1	1	0	1	0	2	2	2	4	0	0	0	0	1	0	40	2	13	69	4%	12	2%	57	6%
12-Sheridan Street	1	25	0	3	1	24	8	8	13	1	1	0	0	0	0	17	2	8	113	6%	85	11%	28	3%
13-Hollywood	0	1	0	0	0	1	7	4	4	1	0	0	0	0	0	3	2	6	30	2%	19	3%	11	1%
14-Golden Glades	0	5	3	0	9	1	8	19	14	1	2	0	0	0	0	1	1	8	73	4%	63	8%	10	1%
15-Opa-locka	1	3	16	0	0	1	22	5	23	8	4	3	1	0	0	4	2	26	118	7%	85	11%	32	3%
16-Metrorail	0	1	2	0	0	18	11	16	31	14	8	5	5	0	1	0	0	1	112	6%	111	14%	1	0%
17-Hialeah Market	0	25	0	0	0	0	3	12	7	0	0	0	0	0	0	0	0	0	48	3%	48	6%	0	0%
18-Miami Airport	0	51	13	3	0	1	8	10	31	33	24	9	2	2	2	0	0	0	190	11%	190	25%	0	0%
Total	19	204	42	12	36	129	112	128	216	143	97	47	34	25	19	303	33	162	1,761	100%	772	100%	989	100%
Total %	1%	12%	2%	1%	2%	7%	6%	7%	12%	8%	6%	3%	2%	1%	1%	17%	2%	9%	100%					
NB Total	19	203	42	11	19	69	75	77	129	58	40	18	8	2	3	0	0	0	772	44%	No. of Stations Traveled	1	18	1%
NB %	2%	26%	5%	1%	2%	9%	10%	10%	17%	8%	5%	2%	1%	0%	0%	0%	0%	0%	100%			2	46	3%
SB Total	0	1	0	1	17	60	36	51	87	85	58	30	26	23	16	303	33	162	989	56%		3	137	8%
SB %	0%	0%	0%	0%	2%	6%	4%	5%	9%	9%	6%	3%	3%	2%	2%	31%	3%	16%	100%		3+	1,559	89%	

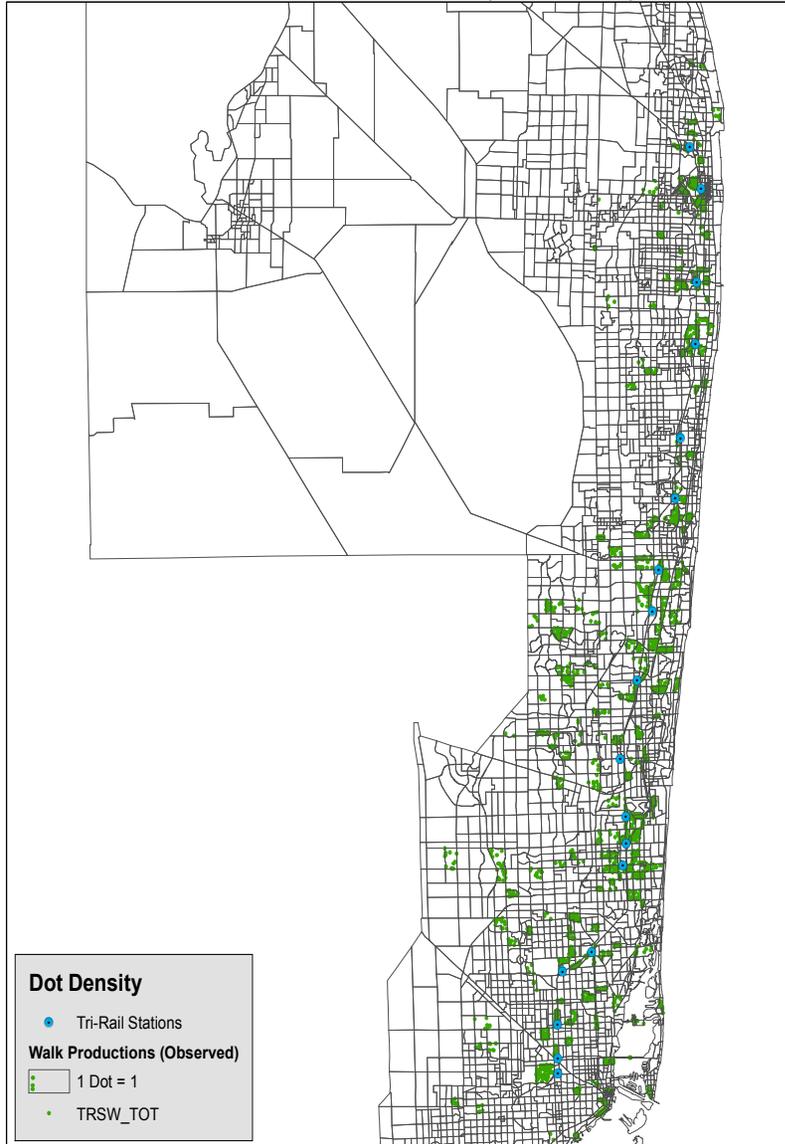


**Table T-15: Tri-Rail Observed vs. Estimated Linked Trips
(by Period by Purpose by Market Segment by Access Mode by Line Haul Mode)**

Observed Transit Trips															Estimated Transit Trips									
Tri-Rail			WALK			PNR			KNR			Total	Total %	WALK			PNR			KNR			Total	Total %
TOD	Purpose	Availability	Local/Mixed walk	Premium walk	Premium auto	Local/Mixed walk	Premium walk	Premium auto	Local/Mixed walk	Premium walk	Premium auto			Local/Mixed walk	Premium walk	Premium auto	Local/Mixed walk	Premium walk	Premium auto	Local/Mixed walk	Premium walk	Premium auto		
PK	HBW	0-Car	114	114	54	3	9	0	0	34	6	334	3%	571	576	22	3	34	1	40	256	10	1,512	13%
		Workers>Cars	206	132	12	42	243	75	143	223	81	1,155	12%	138	152	55	69	502	16	53	283	121	1,390	12%
		Cars>=Workers	226	258	78	503	2,076	585	93	203	227	4,249	44%	59	92	29	125	1,293	584	43	246	75	2,545	23%
	HBO	0-Car	26	0	0	0	0	0	0	0	0	26	0%	195	216	14	5	25	1	35	179	10	677	6%
		Other	39	0	3	14	171	54	37	57	14	389	4%	60	100	91	62	227	289	32	108	122	1,091	10%
NHB Total			40	33	33	3	4	2	10	23	13	161	2%	37	132	87	12	107	108	5	32	28	548	5%
OP	HBW	0-Car	51	50	12	0	0	0	5	2	30	150	2%	124	102	5	1	9	1	59	238	18	558	5%
		Workers>Cars	169	80	28	19	126	46	69	84	89	710	7%	24	29	13	25	120	5	29	101	65	411	4%
		Cars>=Workers	114	207	81	144	663	274	24	134	102	1,743	18%	14	21	8	52	373	257	18	72	34	849	8%
	HBO	0-Car	20	0	17	0	0	0	0	0	11	49	0%	166	115	6	7	17	1	43	86	9	450	4%
		Other	102	56	14	11	187	56	21	107	36	591	6%	49	47	53	69	154	278	13	19	30	710	6%
NHB Total			35	60	50	12	4	13	6	7	21	207	2%	21	38	31	26	124	184	7	20	25	475	4%
Total			1,141	990	382	751	3,483	1,104	408	873	631	9,763	100%	1,458	1,619	413	454	2,984	1,725	377	1,641	545	11,216	100%
Total %			12%	10%	4%	8%	36%	11%	4%	9%	6%	100%		13%	14%	4%	4%	27%	15%	3%	15%	5%	100%	
PK HBS Total			2	26	43	4	90	2	17	423	398	1,006	41%	0	26	22	5	81	2	17	386	321	860	49%
PK HBU Total			94	82	22	114	104	33	147	75	10	680	28%	21	85	26	7	67	57	5	44	28	340	19%
OP HBS Total			1	4	4	2	14	5	14	46	73	163	7%	0	4	4	2	14	5	0	42	65	136	8%
OP HBU Total			69	43	3	82	184	58	66	59	24	588	24%	12	50	14	16	151	107	6	48	26	430	24%
Total			166	154	72	202	393	99	244	603	505	2,437	100%	32	165	66	30	313	171	28	521	440	1,766	100%
Total %			7%	6%	3%	8%	16%	4%	10%	25%	21%	100%		2%	9%	4%	2%	18%	10%	2%	29%	25%	100%	
Grand Total			1,306	1,144	455	953	3,876	1,203	652	1,476	1,136	12,200		1,490	1,784	480	484	3,297	1,896	404	2,162	986	12,982	
Grand Total %			11%	9%	4%	8%	32%	10%	5%	12%	9%	100%		11%	14%	4%	4%	25%	15%	3%	17%	8%	100%	

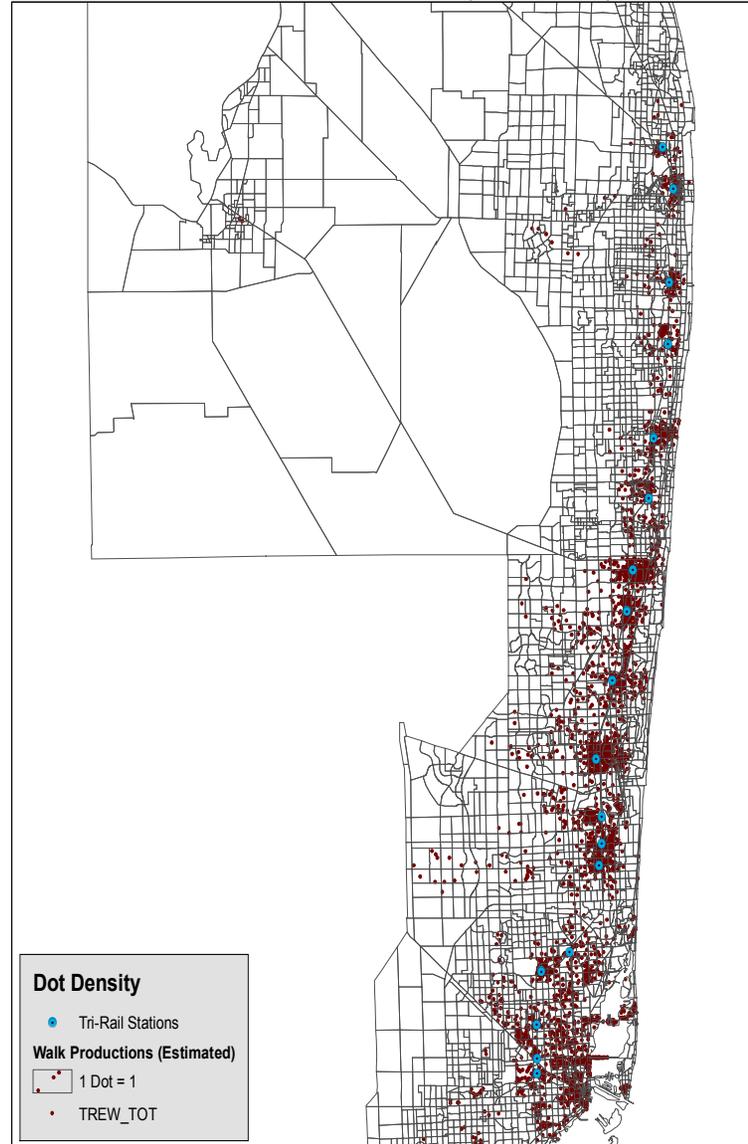
Tri-rail Walk Productions (Observed)

11/29/2011

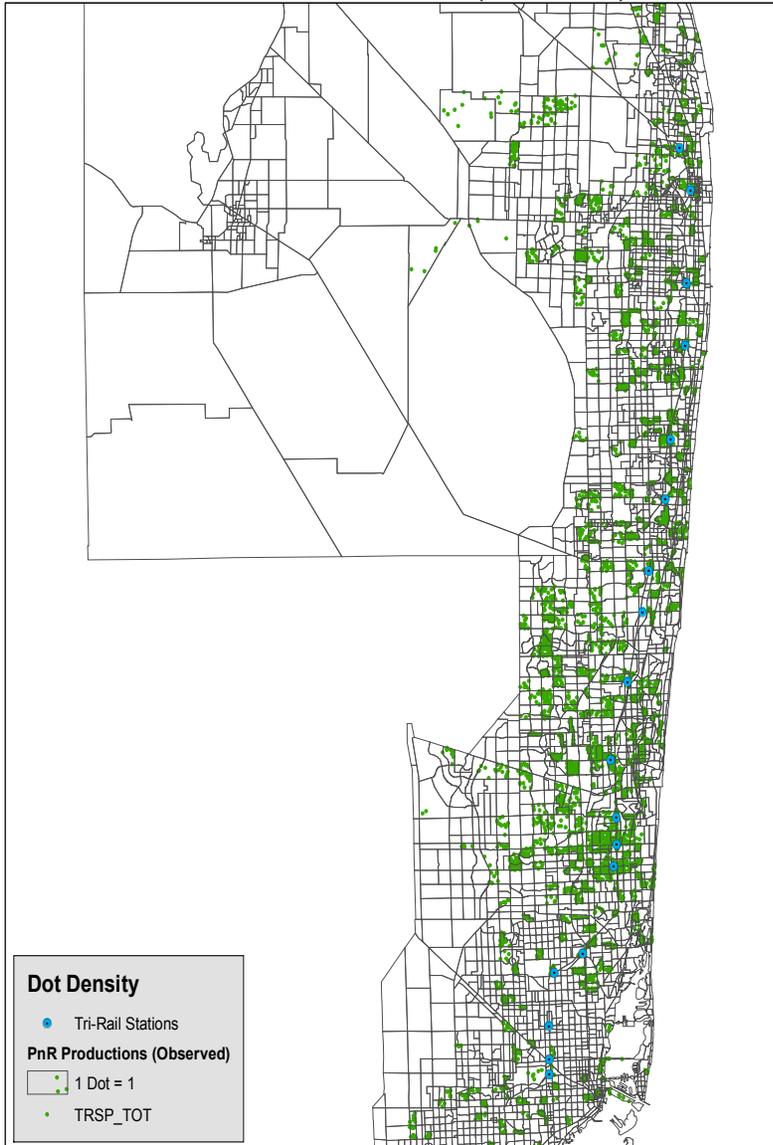


Tri-rail Walk Productions (Estimated)

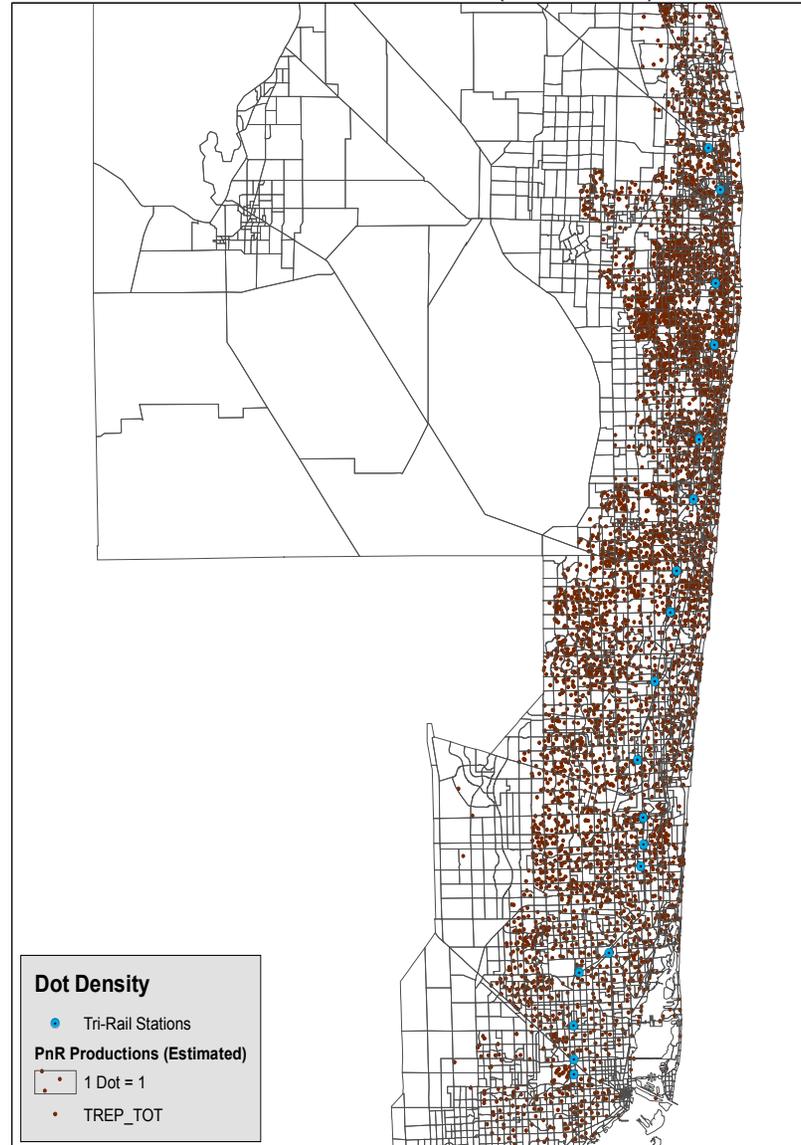
2/7/2012



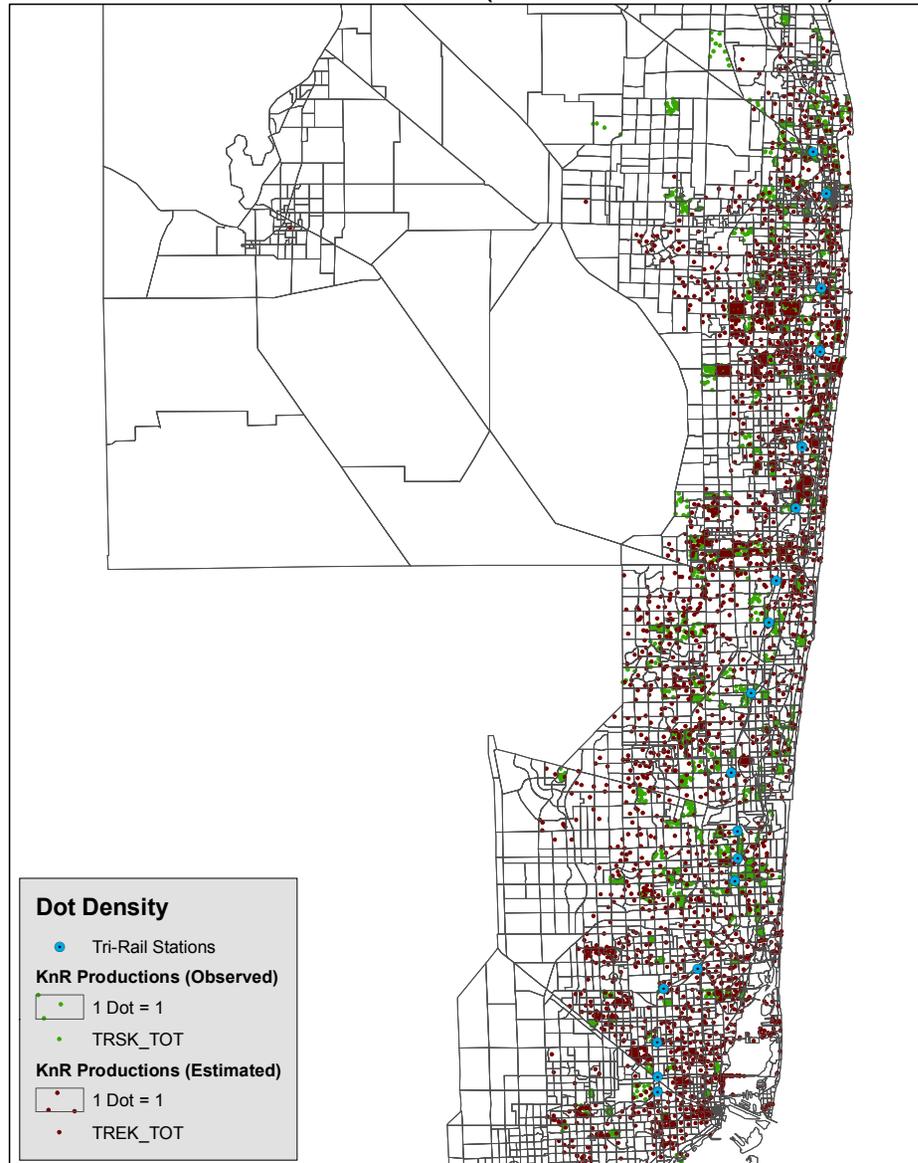
Tri-rail PNR Productions (Observed) 11/29/2011



Tri-rail PNR Productions (Estimated) 2/7/2012



Tri-rail KNR Productions (Estimated/Observed) 2/7/2012



Tri-Rail Coastal Link Study

(formerly known as the South Florida East Coast Corridor Study)

Tri-Rail Coastal Link

Getting Southeast Florida To Work



Broward Metropolitan Planning Organization
Florida Department of Transportation
Miami-Dade Metropolitan Planning Organization
Palm Beach Metropolitan Planning Organization
Southeast Florida Transportation Council
South Florida Regional Planning Council
South Florida Regional Transportation Authority
Treasure Coast Regional Planning Council

Preliminary Project Development Report

April 2014

Appendix 2B: Case for the Project

FINAL

FM No. 41703132201

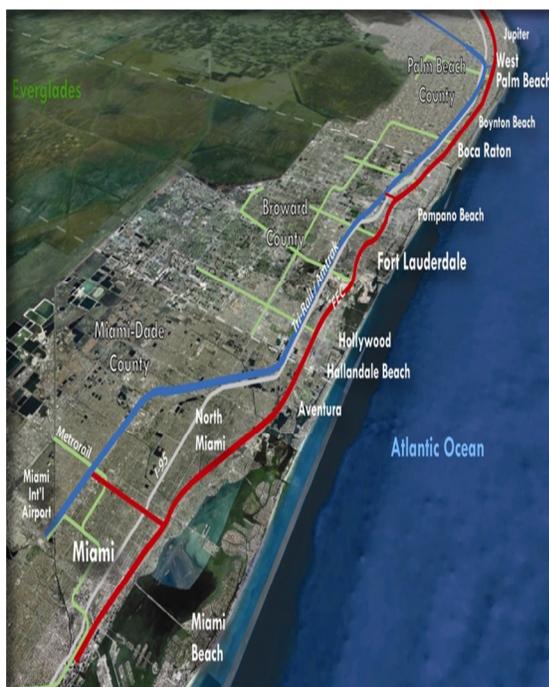




Project Identification

The study corridor (shown in Figure 1) is 85 miles in length and between four and eight miles in width, encompassing major stretches of Palm Beach (~44 miles), Broward (~25 miles) and Miami-Dade (~16 miles) Counties. The corridor extends from just north of Jupiter in northern Palm Beach County, traverses Broward County, and terminates in downtown Miami in Miami-Dade County. The western and eastern boundaries are ½-mile to the west of I-95/South Florida Rail Corridor (SFRC) and ½-mile to the east of US 1, respectively. The center of the corridor is the Florida East Coast Railway (FEC) track, which is located between I-95 and the US 1 area throughout the corridor.

Figure 1: Study Area



Setting

The region's economic core is contained within the corridor, including one million jobs, multiple Central Business Districts (CBDs), three international airports, three seaports, and extensive rail, truck and marine freight. The corridor encompasses 26 percent of the region's population (a total of 1.5 million people) and 34 percent of the region's employment. Employment

centers located in the corridor include downtown Miami, downtown Ft. Lauderdale, Boca Raton and West Palm Beach. Because of the close proximity of the activity centers, a large percentage of trips in the corridor are inter-county trips (1.9 million) with some traveling through all three counties. The largest employment center is downtown Miami (109,000 jobs). Downtown Fort Lauderdale (26,000 jobs) and downtown West Palm Beach (23,000 jobs) also provide sizeable employment.

The corridor is served by two major north-south roadways: I-95 and US-1. The section of I-95 in the corridor is the most heavily used in the state, experiencing over 300,000 vehicles per day. High Occupancy Toll (HOT) lanes were completed in 2009 between Golden Glades in Miami-Dade County and downtown Miami (representing about ¼ of the corridor). The tolls on the HOT lanes vary according to their observed speeds, and oscillate between \$0.25 for free-flow conditions and \$7.00 for heavily-congested times. US-1 is a heavily-used north south arterial that provides local connections between the numerous towns, cities and CBDs in the corridor. Major arterials intersect I-95 and US-1 every 1-2 miles throughout the entire corridor. The only east-west interstate, I-595, terminates at I-95 and US-1 just south of downtown Fort Lauderdale.

The corridor offers public transportation options, although there is no direct way to traverse the entire corridor via transit. South Florida Regional Transportation Authority (SFRTA) operates 50 Tri-Rail trains per weekday with 20-minute service in the peak hour and hourly service in the off-peak. Local bus service generally operates at 20-30 minute headways throughout the day, with 15-30 minute peak headways on all corridor buses. Limited-stop service is offered in Miami-Dade and Broward Counties, although in the latter the service is offered in the peak period only. Express bus service is provided between downtown Miami and various points along the corridor, including Golden Glades (12 miles from the Miami CBD), Sheridan Street (21 miles from the Miami CBD), and Broward Boulevard (27 miles from the Miami CBD). In addition, there are various circulator services provided by the transit agencies and cities.



I-95 and US-1 are both immediately adjacent to railroad tracks. The South Florida Rail Corridor (SFRC) is adjacent and parallel to I-95 throughout much of the corridor. In this corridor, SFRTA operates Tri-Rail commuter rail, Amtrak operates four long-distance passenger trains per weekday, and the CSXT Railroad operates on average three freight trains per weekday. The FEC operates freight rail on tracks adjacent to US-1. FEC currently operates, on average, 11 through-freight trains per weekday on the tracks within the corridor.

Current Conditions (2010)

The existing transportation options within the corridor are heavily utilized and at capacity. There are nearly three million person trips in the corridor each weekday. The AM peak auto travel time between Jupiter and downtown Miami, a distance of 85 miles, is 125 minutes southbound and 99 minutes northbound. Morning peak auto congestion and volume is strongest in Miami-Dade County, particularly in the southbound direction towards downtown Miami. Over 300,000 vehicles per day use I-95 in Miami-Dade County.

This corridor, on a county by county basis, is a particularly strong transit corridor, with 53,000 boardings per weekday on bus and rail transit as shown in Table 1. There are over 10,000 bus riders in each county, and Tri-Rail draws 12,200 riders per weekday. However, there is no direct way to traverse the entire corridor via transit and provide access to the major employment and activity centers. Tri-Rail provides the closest transit option, with a 105-minute travel time between Mangonia Park (just north and west of West Palm Beach) and Miami International Airport (MIA) (about 5 miles west of downtown Miami). The equivalent bus option requires three transfers and more than three hours of total in-vehicle travel time (IVTT).

Table 1: Corridor Transit Boardings per Weekday			
Operator	Route	Average Weekday Boardings (2010)	Headway (Peak/Off-Peak)
South Florida Regional Transit Agency	Tri-Rail	12,200	20-30/60
Palm Tran	#1	7,400	SB: 17/20 NB: 20/20
	#2	4,800	30/30
	#70	1,000	30/60
Broward County Transit	#1	7,200	15/15
	#10	4,000	30/30
	US-1 Breeze	900	30/--
	#50	4,700	20/30
Miami-Dade Transit	#3	7,400	18/18
	#93	3,400	SB: 18/25 NB: 18/30
Total Corridor		53,000	

Source: Route boardings are from observed data gathered from various sources; headways from public timetables available on operator's website.

Changes in 2016 (Compared to 2010)

It is anticipated that the corridor will receive strong demographic growth by 2016 and beyond, although the opportunity for improvements in the transportation network are limited. The corridor's population is expected to grow by 7.5 percent by 2016. Employment is expected to grow by 6.6 percent during the same time. These figures are slightly lower than regional growth rates.

There are limited opportunities for roadway expansion. By 2016, the I-95 HOT lanes will be extended 15 miles to Broward Boulevard, just west



of downtown Fort Lauderdale. Along this stretch, one HOV lane will be replaced with two HOT lanes. One additional lane in each direction will be added along I-95 between Boca Raton and the Palm Beach-Broward County line (from a combined six lanes to eight lanes in both directions). Also, an additional lane will be constructed on SR-7/US 441 between just north of Pines Boulevard and the Broward-Miami Dade County Line (four to six lanes). Finally, three reversible HOT lanes (currently under construction) will be added to I-595 with capacity and access improvements on the general purpose lanes.

Several transit improvements have initiated service within the past year. For example, express bus service was recently added to connect western Broward County with downtown Miami. The Metrorail extension from the existing station at Earlington Heights to MIA's Miami Intermodal Center (MIC) was operational in April 2012. The original line will continue to operate at 10/15 minute peak/off-peak (pk/op) headways, and the Earlington Heights Extension will operate at 10/15 minute pk/op headways. South of the Earlington Heights Extension, Metrorail will operate at 5/7.5 minute pk/op headways, much higher than the current 10/15 minute pk/op service.

Overall, the region's transit agencies are expected to see a modest increase in their transit service levels by 2016. Compared to the existing level of service, Palm Tran, BCT and MDT hope to modestly increase existing service by about two percent to five percent in transit vehicle-hours.

The transit ridership along the corridor and the entire region are expected to increase by seven percent and 18 percent respectively by 2016.

Changes in 2035

By 2035 the corridor is expected to receive the full impact of long-term, strong demographic growth, with continued limited transportation improvement opportunities to compensate fully for the growth. Corridor population and employment are expected to grow 31 percent and 28 percent as compared to their 2010 values. These growth rates are consistent with corresponding regional values.

Employment is expected to grow in all three major downtowns: West Palm Beach by 48 percent to 33,000 jobs, Miami by 23 percent to 133,000 jobs, and Ft. Lauderdale by 10 percent to 28,000 jobs. The person trips and work trips in the corridor are expected to grow by 30 percent to 3.8 million and 29 percent to 0.8 million, respectively.

Roadway improvements are limited due to the built-out environment in the corridor. The only major improvement is the I-95 Express lanes, which will be extended from Broward Boulevard north to Yamato Road in Palm Beach County, an extension of 20 miles. Minor capacity improvements will be made on US-1 in Boca Raton, where a ~four-mile stretch will be extended from four to six lanes in each direction. A complete Open Road Tolling (ORT) system will be implemented on Florida's Turnpike and Sawgrass Expressway to minimize toll plaza delays.

There are no major transit improvements anticipated to occur in the corridor between 2016 and 2035. The transit ridership along the corridor is expected to increase by 47 percent compared to the 2010 values. The region-wide transit linked trips are expected to double by 2035.

The expected growth in population and employment will have an adverse impact on travel along US-1 and other connecting and parallel roadways in South Miami-Dade County. Traveling from Kendall to the Miami CBD by auto takes 311 minutes for the 29-mile trip, which is more than three times the time it takes in 2010.

Purpose of the Project

Improvements to non-automobile transportation modes within Southeast Florida are greatly needed due to a high-level of existing and projected roadway congestion on I-95 and U.S. 1 as well as other major connecting and parallel roadways in the Tri-Rail Coastal Link study area. Projected population and employment growth within the region combined with increased numbers of vehicle trips per capita and longer trip lengths are the causes of the growing traffic congestion. Congestion caused by existing and future travel demand results in poor transportation system performance.



This congestion, coupled with underserved travel markets and insufficient regional connectivity inhibits travel mobility, causes longer and frequent roadway delays, wastes fuel and personal time, stifles economic growth, and diminishes the overall quality of life in Palm Beach, Broward and Miami-Dade Counties.

Local and regional policy and planning address the problem of increasing traffic congestion by using transit solutions. Implementation of an effective north-south transportation network within the Tri-Rail Coastal Link study area is vital to alleviate current and projected connectivity and mobility problems affecting the region.

The primary purpose of the project is to develop transportation options that provide a premium transit service to address needed transportation system capacity, improve mobility, provide efficient access to key travel markets, and provide improved regional connectivity for the urbanized area encompassing Palm Beach, Broward and Miami-Dade Counties. Ultimately, the preferred transportation alternative selected through this analysis will provide reliable, regional high-capacity transit infrastructure through the highest density areas of the Southeast Florida region and support intermodal connectivity with existing and planned transit services to serve other areas of the region.

Merits of the Low Cost Alternative

The proposed Low Cost Alternative for 2035 calls for four connecting Bus Rapid Transit (BRT) routes between downtown Miami and Jupiter with 15-minute service in both peak and off-peak periods with one-mile stop spacing. This service replaces the existing limited-stop bus service in Miami-Dade and Broward Counties. The underlying local bus services in the corridor will operate at 30/60 minute headways. Table 2 shows the projected boardings and travel time savings for each route as compared to the 2035 No-Build Alternative.

Table 2: Low Cost Alternative Boardings per Weekday (Preliminary Results)			
Proposed BRT Route	IVTT Savings (min*)	Weekday Boardings (Total)	Weekday Boardings (Mobility Dependents)
Jupiter to Mangonia Park	22	3,100	1,200
Mangonia Park to Boca Raton	56	9,300	3,400
Boca Raton to Aventura	12	15,700	6,000
Aventura to Miami Gov't Center	20	17,800	3,800
Total		45,900	14,300

Source: Southeast Florida Regional Planning Model v.6.7
*Compared to No-Build Alternative

Overall, the Low Cost Alternative is expected to produce 45,900 boardings per weekday. A substantial number of these riders are existing transit users, as the Low Cost Alternative is expected to produce 2,000 new linked transit trips and 2,810 user benefits over the No-Build Alternative. About 30 percent of the user benefits are attributable to transit dependent populations.

The proposed BRTs replace the existing limited stop service buses in Broward and Miami-Dade Counties and provide a faster, reliable and more frequent service. There is also a reduction in the service of the underlying local buses. Therefore, there is a significant reduction in the boardings of these corridor buses. The ridership on these local corridor buses is 50,200 in the No-Build Alternative, which goes down by 53 percent in the Low Cost Alternative. Further, the Tri-Rail ridership goes down by eight percent from 19,700 in the No-Build Alternative. This is partly because the fare on the BRTs can be significantly lower than the Tri-Rail zonal fares.



The primary disadvantage of the Low Cost Alternative is that servicing the entire corridor with non-stop bus transit is operationally impractical given the long travel times. Consequently riders will be expected to transfer for certain travel patterns and thus the Alternative’s ability to produce many new transit riders is limited.

Merits of the Interim Build Alternative (IBA)

The Interim Build Alternative (IBA) calls for an integrated passenger rail service connecting Tri-Rail and the FEC rail corridors. Twenty new stations are included, spaced at an average of four miles and generally located offset from the existing parallel Tri-Rail locations. Like the Low Cost Alternative, the IBA will directly connect the three major downtowns along the corridor – Miami, Ft. Lauderdale and West Palm Beach – with other densely populated municipalities in eastern Miami-Dade, Broward and Palm Beach Counties.

As shown in Figure 2, the following rail services are part of the IBA:

- Mangonia Park to MIA at 60/120 minute pk/op headways
- Jupiter (Toney Penna Dr.) to MIA at 60/120 minute pk/op headways
- West Palm Beach 45th St. to Miami Government Center at 60/120 minute pk/op headways
- Pompano Beach Tri-Rail station to Miami Government Center at 30/60 minute pk/op headways.

The entire rail line integrated with Tri-Rail is expected to achieve 42,400 boardings by 2035. No-Build Tri-Rail riders comprise 46 percent of the ridership on the IBA. Since the IBA passes through all the major employment centers and high density municipalities, some of the No-Build Tri-Rail riders switch to the new FEC line. Further, the IBA saves 10 minutes of IVTT as compared to the existing Tri-Rail/Metrorail path for all trips originating north of Golden Glades and terminating in downtown Miami. Throughout the corridor the IBA provides similar time savings. Along the US-1 corridor, it

eliminates the need to make a transfer while making most cross-county bus trips. Table 3 shows the IVTT savings in the IBA for people going to downtown Miami. The No-Build rail only path assumes boarding at a Tri-Rail station and transferring to Metrorail. The IBA path assumes boarding at the new FEC stations.

Table 3: Rail-Only IVTT to Miami Government Center (minutes)			
Origin Station	No-Build (Rail-only)	IBA	IVTT Savings
West Palm Beach CBD	118	110	8
Delray Beach	93	83	10
Pompano Beach	74	62	12
Ft. Lauderdale CBD	59	48	11
Sheridan St.*	47	39	8
Hollywood	43	34	9
Golden Glades	34	24	10

Source: IBA operating plan

*Boarding assumed at Dania Beach Boulevard FEC station in the IBA.

As a result of the improved connectivity and travel time savings, 22 percent of the No-Build Tri-Rail riders completely switch to the FEC lines and a further 10 percent use the FEC lines to either their origin or destination ends.

The remaining 54 percent of the IBA riders are new rail riders who were previously using some other form of transit or auto. The IBA provides a 20/40 minute peak/off-peak service along the FEC corridor south of Atlantic Boulevard in Pompano Beach. This section of the corridor connects the two major downtowns in Fort Lauderdale and Miami with some of the densely populated cities in North Miami and South Broward. As a result, almost 87 percent of the new riders come from south of Pompano Beach.

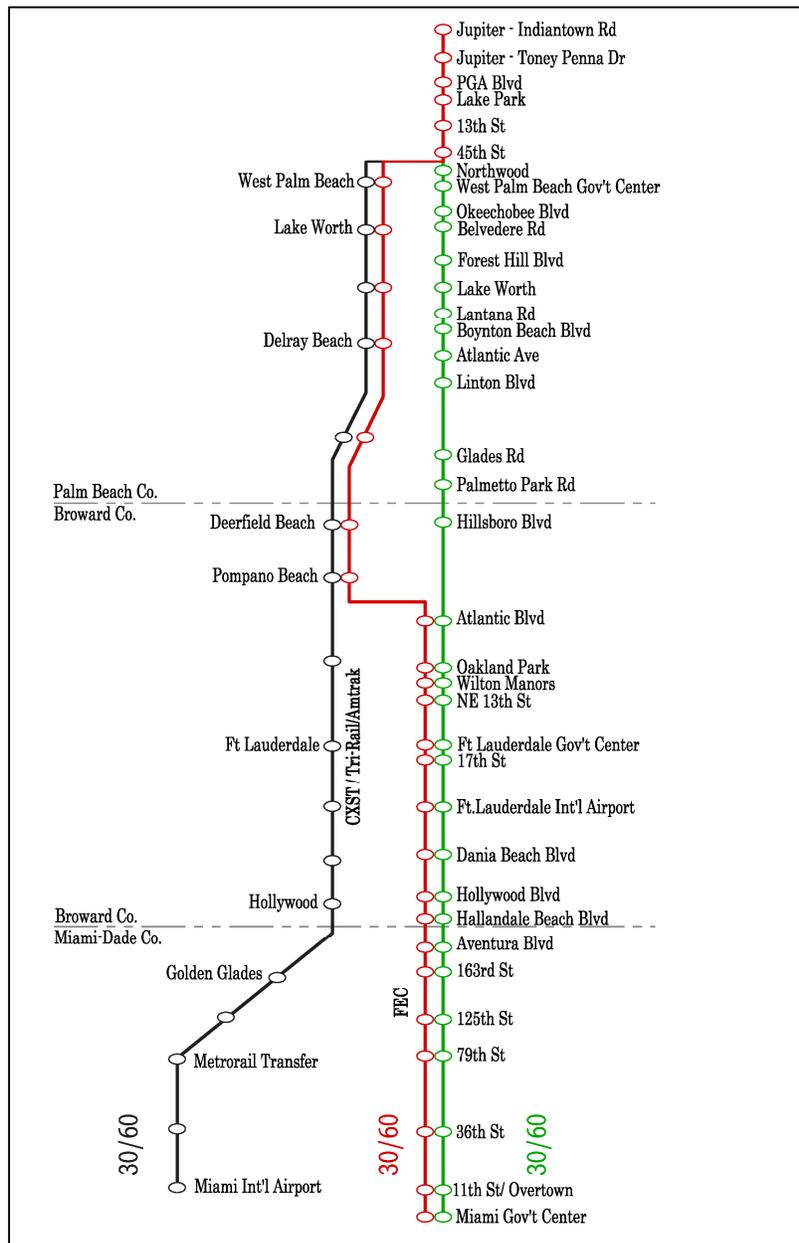
Like the Low Cost Alternative, many of the boardings on the IBA are existing transit riders.



However, the IBA is expected to produce 6,800 new transit trips and 5,300 hours of user benefits per average weekday which is almost double the Low Cost Alternative. The IBA also draws boardings from the corridor transit buses. The boarding on these buses goes down by eight percent in comparison to the No-Build. Boardings from transit

dependent populations accrue 530 hours of project benefits. Work trips comprise 69 percent of the overall project boardings and 66 percent of the project benefits. Nearly 65 percent of the project benefits derive from trips traveling entirely within the study area.

Figure 2: Interim Build Alternative with Existing Tri-Rail Stations





Potential Uncertainty - Ridership

The following sources of uncertainties are briefly summarized below along with a description of their potential impacts on the project ridership.

Demographic Growth

The large expected demographic growth, combined with the limited roadway improvements in the project corridor, have two results that make it difficult to develop an accurate forecast of transit behavior. One is the large increase in the size of the potential travel markets. Travel models generally have a difficult time applying existing travel patterns to scenarios with such large demographic or socio-economic changes. The other result is the projected sharp decrease in auto and transit travel times, which make the rail option very attractive by comparison. Sharp decreases may not occur in reality as migration and development patterns react to unfavorable and unreliable transportation conditions, which sometimes partially mitigate the magnitude of decline in travel speeds and times. In addition, travel models are not well designed to handle behavioral reactions to significant transportation congestion. Even if the expected demographic growth levels were to occur in a county, the distribution of the housing and job growth can be entirely different from what is being projected right now. Obviously, a different distribution of the growth will result in different potential travel markets on the project.

Auto Fuel Prices

Changes in fuel prices have had significant impacts on the ridership of Tri-Rail. Based on American Public Transportation Association (APTA) reports, the average weekday ridership on Tri-Rail in the month of June 2010 reduced to 12,200 from 15,000 in June 2008. The fuel prices were about 50 percent higher in June 2008 compared to June 2010. However, it should also be mentioned that there were large macroeconomic differences from June 2008, the height of the most recent economic cycle, to June 2010, near the low point of the current economic downturn. Nevertheless, it has generally been reported that auto fuel prices have an impact on the ridership of a commuter rail system.

Rail Passenger Fare

The passenger fare directly impacts the ridership of any transit system. Existing zonal based fares similar to Tri-Rail with an additional fare zone for Jupiter will be used for the new FEC corridor system. The same fares are used for both the opening and horizon year builds. The forecasted ridership will be lower if there is any increase in the fares.

A series of alternate scenarios have been prepared to address the key sources of uncertainty and their impact on the ridership forecasts. Sixteen forecasts have been developed using the travel demand model, with each forecast highlighting a different source. Their characteristics and results are summarized in Table 4. Six different demographic scenarios are tested: 2010 (existing year), 2016 (opening year), 2035 standard forecast (horizon year), 2035 forecast with reduced growth between 2010-2035, 2035 forecast with transit-oriented development (TOD), and a 2035 forecast with reduced growth and TOD. Three sets of roadway improvements are tested: 2010 (existing), 2016 (opening year) and 2035 (horizon year). Also, the impacts of a 50 percent increase in fuel prices, a 25 percent increase in rail passenger fares, and a 25 percent increase in Miami parking costs are tested. All 'Build' forecasts in Table 4 refer to the IBA.

The ridership forecasts on the integrated system range from 20,700 to 44,900. The 'standard' horizon year interim build forecast generates 42,400 boardings/ weekday. The opening year forecasts range from 20,700 to 25,000 boardings/weekday and the horizon year forecasts range from 29,400 to 44,900 weekday boardings.

Analysis of the forecasts shows that a 25 percent increase in rail passenger fare has a significant impact on the boardings. There is a 16 percent reduction in boardings (estimated elasticity of -0.65) for both the opening (Forecast #5 vs. Forecast #3) and horizon year (Forecast #13 vs. Forecast #10) forecasts. Increase in the parking costs at downtown Miami does not have a large impact on the forecasts. (Forecast #6 vs. Forecast #3, Forecast #14 vs. Forecast #10). The estimated fuel price elasticity ranges from +0.12 – 0.20.



Table 4: Ridership Uncertainty Forecasts

Forecast #	Description	Attribute						Project Boardings/ Weekday
		Pop/Emp Scenario	Background Hwy Network	Background Transit Network	Fuel Prices	TRL/ FEC Fare	Miami Parking Costs	
1	Existing Year Build	2010	2010	2010	2010 levels	existing	existing	22,000
2	'Opening Year' Build, with no improvements to background services	2016	2010	2012	2010 levels	existing	existing	25,100
3	'Opening Year' Build	2016	2016	2012	2010 levels	existing	existing	24,700
4	'Opening Year' Build with 50% increase in fuel prices	2016	2016	2012	2010 levels + 50% increase	existing	existing	27,200
5	'Opening Year' Build with 25% increase in rail passenger fares	2016	2016	2012	2010 levels	existing + 25% increase	existing	20,700
6	'Opening Year' Build with 25% increase in Miami parking costs	2016	2016	2012	2010 levels	existing	existing + 25% increase	25,000
7	'Opening Year' Build with 50% increase in fuel prices and 25% increase in rail pax fares	2016	2016	2012	2010 levels + 50% increase	existing + 25% increase	existing	22,800
8	Horizon Year Build, with reduced growth rates	2035 Reduced Growth	2035	2012	2010 levels	existing	existing	39,200
9	Horizon Year Build, with reduced growth rates and TOD	2035 Reduced Growth + TOD	2035	2012	2010 levels	existing	existing	29,400
10	Horizon Year Build	2035	2035	2012	2010 levels	existing	existing	42,400
11	Horizon Year Build, with TOD	2035 + TOD	2035	2012	2010 levels	existing	existing	32,800
12	Horizon Year Build with 50% increase in fuel prices	2035	2035	2012	2010 levels + 50% increase	existing	existing	44,900
13	Horizon Year Build with 25% in rail passenger fares	2035	2035	2012	2010 levels	existing + 25% increase	existing	35,800
14	Horizon Year Build with 25% increase in Miami parking costs	2035	2035	2012	2010 levels	existing	existing + 25% increase	42,900
15	Horizon Year Build with 50% increase in fuel prices and 25% increase in rail pax fares	2035	2035	2012	2010 levels + 50% increase	existing + 25% increase	existing	37,800
16	Horizon Year Build, with no roadway improvements	2035	2010	2012	2010 levels	existing	existing	43,200

Note: "Build" in this Table refers to the IBA.

There is an improved job-household mix in southern Miami-Dade County under the TOD scenarios (Forecast #10 & Forecast #11). There is a drastic improvement in the northbound auto speeds from South Miami-Dade in the case with

TOD (Forecast #11) compared to the standard interim build case (Forecast #10). As a result, there is a significant drop in the ridership of the IBA.

Summary

The South Florida East Coast Corridor (SFECC) is expected to have growth rates of 31 percent for population and 28 percent for employment. This will grow the corridor's population from 1.5 million in 2010 to 1.9 million in 2035, and its employment from 1.0 million to 1.2 million. As a result there are large changes expected in the

travel markets. Intra-corridor work trips are expected to increase by 29 percent to 0.8 million per workday. Total daily intra-corridor trips are expected to increase 30 percent to 3.8 million.

Roadway improvements are limited due to the built-out environment in the corridor. A 29-mile auto trip from Kendall to Miami CBD takes about three times the time it takes in current



conditions. The high-level of existing and projected roadway congestion on I-95 and U.S. 1 as well as other major connecting and parallel roadways in the SFECC study area call for improvements to non-automobile transportation modes within Southeast Florida. The Tri-Rail Coastal Link project will provide mobility and accessibility benefits to the key economic and activity centers. The project's ability to operate in exclusive right-of-way will allow riders of the potential project to realize large travel time savings, and better connect the workers living in the corridor to jobs in the nearby major activity centers.

The IBA connects the Tri-Rail and FEC corridors. It connects all the major downtowns, including Miami, Fort Lauderdale and West Palm Beach with high-density eastern communities in the region. The IBA saves 10 minutes of IVTT over the existing Tri-Rail/Metrorail path for all trips originating north of Golden Glades and terminating in downtown Miami. Some of the No-Build Tri-Rail riders switch to FEC, but none of those riders are lost from the integrated rail system. The IBA is expected to draw 6,800 new transit trips and 5,300 hours of user benefits per average weekday. All these 6,800 trips were previously using auto in the No-Build and have now switched to transit.

The IBA provides better connectivity for workers living in the corridor to the major employment centers. Work trips comprise 69 percent of the overall project boardings and 66 percent of the project benefits. Nearly 65 percent of the project benefits derive from trips traveling entirely within the study area. These savings are 10-20 minutes per transit trip, reflecting travel time savings from using the railroad right-of-way and the elimination of the Tri-Rail/Metrorail transfer connection.

There are a high number of transit dependent people in the tri-county area. The IBA provides a better mobility option to these riders. About 21 percent of the ridership is by people from zero-car households. Also, trips from transit dependent populations accrue 530 hours of project benefits.

Overall, the IBA provides a high capacity transit service that addresses needed travel capacity, improves mobility, provides efficient access to key travel markets, and provides improved regional connectivity for the urbanized area encompassing Palm Beach, Broward and Miami-Dade Counties.