Florida East Coast Railway

Development of Passenger Rail Service from Downtown West Palm Beach to Downtown Miami

Railroad Crossings Analysis

1. Introduction

Florida East Coast Railway (FEC) is proposing to develop passenger rail service from downtown West Palm Beach to downtown Miami. The service will include stations at West Palm Beach, Fort Lauderdale, and Miami. This memorandum documents traffic operations analysis for selected railroad crossings at major arterials in the study area. This analysis was done to evaluate the impact of the proposed passenger rail service on adjacent roadway network.

2. Study Crossings

Following major arterials with at-grade crossing with FEC railroad in each of the three counties were selected to be analyzed:

Palm Beach County:

Forest Hill Boulevard Crossing

Linton Boulevard Crossing

Broward County:

Hillsboro Boulevard Crossing

Broward Boulevard Crossing

Miami-Dade County:

US 1/Biscayne Boulevard Crossing

NW 20th Street Crossing

These crossings along with any adjacent intersections were analyzed for Opening Year 2015 and Build out Year 2035.

3. Methodology

The traffic analysis was performed using Synchro/SimTraffic analysis software based on procedures found in the *Highway Capacity Manual (HCM).* The analysis was on following procedure and assumptions:

- Length of the train, speed, and clearance time requirements for closing and opening of the gates at the crossings are based on information from FEC, and in accordance with FRA and FDOT

guidelines. Details of train characteristics, frequency and clearance time are attached to this memorandum.

- Two railroad crossing events are assumed to take place during the PM peak hour, one in each direction, resulting in two crossings per hour. This constitutes a worst case condition, since the traffic conditions on adjacent roadways are represents highest delay/congestion during pm peak period.
- Based on the speed, length and clearance time, the proposed passenger train is anticipated to take approximately fifty two (52) seconds to clear the crossing. The freight trains take much longer (anywhere from 237 seconds to 308 depending on the County) to clear the crossing.
- The peak hour operations at the crossing were divided in to three cycles. The first cycle represents no train crossing event, second cycle represents freight train crossing event, and the third cycle represents passenger train crossing event. Delay was calculated for each of these cycles and the average delay was calculated as the weighted hourly average delay of the signal cycles with no train crossing, with freight train crossing, and with passenger train crossing.
- Levels of service (LOS) for the roadways and intersections in the influence area of the crossing was calculated using the weighted average of the LOS for all signal cycles during the peak hour with and without the train crossing events. For illustration purposes, the LOS is also presented for the affected cycles when the railroad crossings take place.
- All traffic signals are assumed to have pre-emption capabilities, allowing traffic to clear out and/or hold vehicles until the train clears.

3. Traffic Data

Traffic data used in this analysis was obtained from Palm Beach County, Broward County, Dade County and FDOT sources. Some counts used in the analysis were conducted by URS in 2010. Opening Year 2015, and Build out Year 2035 traffic volumes were developed by using a 1% per year growth rate from existing counts. It should be noted that most of the study corridor is built out and has experienced either no growth or negative growth in the past 5 years. Therefore this 1% growth assumption represents a worst-case scenario.

4. Traffic Operational Analysis:

Capacity analyses for all the crossings and intersections in the study area were conducted in accordance with the methodology presented in the Highway Capacity Manual utilizing the Synchro/Simtraffic software, version 7. Level of Service qualitatively relates capacity to operational conditions. LOS ranges

from “A” to “F”, with “A” being the best operating condition and “F” being the worst. Generally, LOS “D” or better is considered acceptable. LOS for signalized intersections is measured by control or signal delay per vehicle. Table 1 provides the delay ranges for LOS “A” through “F”.

TABLE 1
LEVEL OF SERVICE CRITERIA

Level of Service	Delay (seconds/vehicle)
A	<10
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	> 80.0

Source: Highway Capacity Manual (HCM) 2000

For this project intersections and railroad crossings were analyzed for the p.m. peak hour conditions to represent the maximum traffic volumes during the day. The p.m. peak hour generally takes place between 4:00 p.m. and 6:00 p.m. Each location was analyzed without train, with freight train and with passenger train events. The operation includes a clearance phase prior to the arrival of the train to clear any queues present on the railway and adjacent approaches. Then the gates will be closed and train crossing event will run. During this phase, the traffic movements not effected by the crossings will continue to operate normally at the adjacent intersections.

After the train event the intersections should revert back to normal phase operations for the rest of the peak hour. Since the train crossing only occurs two times during the peak hour period, the delay with the rail service was calculated using the weighted average of the delay with one freight train cycle, with one passenger train cycle and delay with no train event for remaining cycles in the hour. Delays and levels of service were also calculated and reported for the affected cycle when railroad crossings are anticipated to take place. Queue lengths were obtained from 95^{th} percentile queue lengths reported by the Synchro Software. The 95^{th} percentile queue represents the queue length that is not expected to be reached 95% of the time. A similar procedure was applied for estimating queue lengths on the approaches to the rail crossing when the train is present. Results for delay, LOS, and queue are summarized for each crossing and adjacent intersection in tabular format.

Summary:

Based on the analysis of the opening year 2015 and build out year 2035 with and without the train service traffic operations at study area crossings and intersections, the following conclusions were reached:

- The passenger train is expected to clear the crossing in 52 seconds and have one such crossing event in the peak hour. The analysis indicates that the additional delay at the crossing caused by the introduction of passenger rail service on the adjacent roadway network is minimal.
- Since the analysis was conducted for the peak hour, any event taking place during non-peak hours would have less impact on traffic operations.
- The traffic operations and LOS at adjacent intersections are anticipated to continue to operate at similar LOS with the introduction of the passenger rail service compared to LOS with already existing freight service. Therefore the additional impact from the passenger rail service is minimal. During a train crossing event, traffic movements not affected by the train will be operated normally to minimize the impact on delay and queues.
- Even though not specifically estimated at this time the train service is expected to benefit some north-south roadways between West Palm Beach and Miami as a result of commuters taking the passenger rail service in place of auto trips.
- It should be noted that some of the crossings have intersections within close proximity of the crossing and queues will back up to and over the FEC railway at these intersection. These queues must be cleared before the rail crossing event under the pre-emption signal cycle operation. Proper signage and traffic controls to alert drivers about the railroad crossings will be in place in accordance to local City, County and State standards.

FEC RAILROAD CROSSING DELAY ESTIMATES-2006 BASE CONDITION

Service Type	Time to activate and close the gate (Sec)	Length (Feet)	Speed (mph)	Time to Clear (Sec)	Time to bring the gate back up (Sec)	Total time to activate and clear (Sec)	Crossings per Day	Delay per Day (Min)	Maximum crossings per hour	Max delay per Hour (Min)
	PALM BEACH									
Freight	30	6750	28.5	161	15	206	**27**	**92.7**	2	**6.9**
	BROWARD									
Freight	30	6750	22.6	204	15	249	**27**	**112.1**	2	**8.3**
	MIAMI-DADE									
Freight	30	6750	29.5	156	15	201	**27**	**90.5**	2	**6.7**

FEC RAILROAD CROSSING DELAY ESTIMATES-2015 OPENING YEAR CONDITION

Service Type	Time to activate and close the gate (Sec)	Length (Feet)	Speed (mph)	Time to Clear (Sec)	Time to bring the gate back up (Sec)	Total time to activate and clear (Sec)	Crossings per Day	Delay per Day (Min)	Maximum crossings per hour	Max delay per Hour (Min)
	PALM BEACH									
Freight	30	8837	30.5	198	15	243	**14**	**56.7**	1	**4.1**
Passenger	30	600	60.1	7	15	52	**12**	**10.4**	1	**0.9**
Total								**67.1**		**5.0**
	BROWARD									
Freight	30	8837	30.5	198	15	243	**14**	**56.7**	1	**4.1**
Passenger	30	600	60.1	7	15	52	**12**	**10.4**	1	**0.9**
Total								**67.1**		**5.0**
	MIAMI-DADE									
Freight	30	8837	31.3	192	15	237	**14**	**55.3**	1	**4.0**
Passenger	30	600	60.1	7	15	52	**12**	**10.4**	1	**0.9**
Total								**65.7**		**4.9**

FEC RAILROAD CROSSING DELAY ESTIMATES-2016 YEAR CONDITION

Service Type	Time to activate and close the gate (Sec)	Length (Feet)	Speed (mph)	Time to Clear (Sec)	Time to bring the gate back up (Sec)	Total time to activate and clear (Sec)	Crossings per Day	Delay per Day (Min)	Maximum crossings per hour	Max delay per Hour (Min)
	PALM BEACH									
Freight	30	8150	39.5	141	15	186	**22**	**68.2**	1	**3.1**
Passenger	30	600	60.1	7	15	52	**16**	**13.9**	1	**0.9**
Total								**82.1**		**4.0**
	BROWARD									
Freight	30	8150	38.5	144	15	189	**22**	**69.3**	1	**3.2**
Passenger	30	600	60.1	7	15	52	**16**	**13.9**	1	**0.9**
Total								**83.2**		**4.1**
	MIAMI-DADE									
Freight	30	8150	33.2	167	15	212	**22**	**77.7**	1	**3.5**
Passenger	30	600	60.1	7	15	52	**16**	**13.9**	1	**0.9**
Total								**91.6**		**4.4**

FEC RAILROAD CROSSING DELAY ESTIMATES-2035 YEAR CONDITION

Service Type	Time to activate and close the gate (Sec)	Length (Feet)	Speed (mph)	Time to Clear (Sec)	Time to bring the gate back up (Sec)	Total time to activate and clear (Sec)	Crossings per Day	Delay per Day (Min)	Maximum crossings per hour	Max delay per Hour (Min)
	PALM BEACH									
Freight	30	12795	39.5	221	15	266	**22**	**97.5**	1	**4.4**
Passenger	30	600	60.1	7	15	52	**16**	**13.9**	1	**0.9**
Total								**111.4**		**5.3**
	BROWARD									
Freight	30	12795	38.5	227	15	272	**22**	**99.7**	1	**4.5**
Passenger	30	600	60.1	7	15	52	**16**	**13.9**	1	**0.9**
Total								**113.6**		**5.4**
	MIAMI-DADE									
Freight	30	12795	33.2	263	15	308	**22**	**112.9**	1	**5.1**
Passenger	30	600	60.1	7	15	52	**16**	**13.9**	1	**0.9**
Total								**126.8**		**6**

Notes:

1 FRA regulations require 20 seconds to activate and close the gate prior to the train entering the railroad crossing and 10 seconds to bring the gate back up. FDOT uses 30 seconds to activate and close the gate prior to the train entering the railroad crossing and 15 seconds to bring the gate back up. To accoutn for the worst-case scenario, FDOT timings were used in this analysis.

2 Time taken for the train to clear the railroad crossing is calculated using the length of the train and speed of the train.

3 A maximum of two trains would cross per hour (Northbound and Southbound combined)

4 To account for freight growth from 2016 to 2035, a 3% per year growth was assumed. The length of the train was increased 3% per year to account for this The number of trains was kept constant.

Mainline Railroad Crossing Delay Analysis
PM Peak hour Delay and LOS
Palm Beach County

Forest Hill Blvd Crossing_Opening Year 2015 Conditions

Approach/Movement	Normal Signal Cycle				Freight Train Crossing Cycle				Passenger Train Crossing Cycle				Weighted Average		
	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	Queue	LOS
Forest Hill Blvd @ Georgia Ave															
Overall Intersection	11.8	B		54	187.9	F		1	36.6	D		1	15.4		B
EB Approach	8.8	B	150	54	240.4	F	1225	1	33.6	C	275	1	13.4	175	B
WB Approach	10.4	B	175	54	157.6	F		1	35.4	D		1	13.5		B
Forest Hill Blvd @ FEC RR Crossing															
EB Approach	0.0	A	0	54	106.7	F		1	10.0	B		1	2.1		A
WB Approach	0.0	A	0	54	238.5	F	1200	1	32.8	C	275	1	4.8	25	A

Forest Hill Blvd Crossing_Build Out Year 2035 Conditions

Approach/Movement	Normal Signal Cycle				Freight Train Crossing Cycle				Passenger Train Crossing Cycle				Weighted Average		
	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	Queue	LOS
Forest Hill Blvd @ Georgia Ave															
Overall Intersection	13.0	B		53	224.3	F		1	45.8	D		1	17.4		B
EB Approach	10.4	B	225	53	379.4	F	1700	1	47.7	D	375	1	17.8	250	B
WB Approach	11.7	B	225	53	89.4	F		1	39.0	D		1	13.6		B
Forest Hill Blvd @ FEC RR Crossing															
EB Approach	0.0	A	0	53	224.6	F		1	11.9	B		1	4.3		A
WB Approach	0.0	A	0	53	380.2	F	1700	1	46.4	D	375	1	7.8	50	A

Linton Blvd Crossing_Opening Year 2015 Conditions

Approach/Movement	Normal Signal Cycle				Freight Train Crossing Cycle				Passenger Train Crossing Cycle				Weighted Average		
	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	Queue	LOS
Linton Blvd @ Dixie Hwy/FEC RR															
Overall Intersection	37.4	D		33	365.0	F		1	103.1	F		1	48.6		D
EB Approach	28.0	C	275	33	323.0	F	1000	1	81.3	F	400	1	38.0	300	D
WB Approach	41.6	D	350	33	486.9	F	1700	1	80.1	F	475	1	55.4	400	E

Linton Blvd Crossing_Build Out Year 2035 Conditions

Approach/Movement	Normal Signal Cycle				Freight Train Crossing Cycle				Passenger Train Crossing Cycle				Weighted Average		
	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	Queue	LOS
Linton Blvd @ Dixie Hwy/FEC RR															
Overall Intersection	52.4	D		33	475.5	F		1	153.8	F		1	67.4		E
EB Approach	39.6	D	400	33	349.3	F	1300	1	120.8	F	500	1	50.8	425	D
WB Approach	56.9	E	525	33	557.6	F	2175	1	119.3	F	600	1	73.0	575	E

Notes:
1.Delay measured in sec/veh;
2.LOS-Level of Service
3.Queue lengths shown are in feet rounded to nearest 25 feet.
4. To obtain 2015 and 2035 volumes, existing volumes were grown at 1% per year growth rate

Mainline Railroad Crossing Delay Analysis
PM Peak hour Delay and LOS
Broward County

Hillsboro Blvd Crossing_Opening Year 2015 Conditions

Approach/Movement	Normal Signal Cycle				Freight Train Crossing Cycle				Passenger Train Crossing Cycle				Weighted Average		
	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	Queue	LOS
Hillsboro Blvd @ FEC RR															
Overall Intersection	0.0	A		53	299.2	F		1	28.4	C		1	6.0		A
EB Approach	0.0	A	0	53	233.7	F	1600	1	25.4	C	350	1	4.7	25	A
WB Approach	0.0	A	0	53	353.2	F	2150	1	30.9	C	475	1	7.0	50	A

Hillsboro Blvd Crossing_Build Out Year 2035 Conditions

Approach/Movement	Normal Signal Cycle				Freight Train Crossing Cycle				Passenger Train Crossing Cycle				Weighted Average		
	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	Queue	LOS
Hillsboro Blvd @ FEC RR															
Overall Intersection	0.0	A		53	489.1	F		1	44.8	D		1	9.7		A
EB Approach	0.0	A	0	53	403.3	F	2325	1	29.8	C	450	1	7.9	50	A
WB Approach	0.0	A	0	53	559.8	F	3026	1	57.1	E	675	1	11.2	75	B

Broward Blvd Crossing_Opening Year 2015 Conditions

Approach/Movement	Normal Signal Cycle				Freight Train Crossing Cycle				Passenger Train Crossing Cycle				Weighted Average		
	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	Queue	LOS
Broward Blvd @ FEC RR															
Overall Intersection	0.0	A		52	571.3	F		1	41.3	D		1	11.3		B
EB Approach	0.0	A	0	52	651.0	F	3475	1	52.7	D	925	1	13.0	75	B
WB Approach	0.0	A	0	52	474.4	F	2700	1	27.5	C	600	1	9.3	50	B

Broward Blvd Crossing_Build Out Year 2035 Conditions

Approach/Movement	Normal Signal Cycle				Freight Train Crossing Cycle				Passenger Train Crossing Cycle				Weighted Average		
	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	Queue	LOS
Broward Blvd @ FEC RR															
Overall Intersection	0.0	A		52	841.0	F		1	93.2	F		1	17.3		B
EB Approach	0.0	A	0	52	943.7	F	4750	1	132.0	C	1225	1	19.9	100	B
WB Approach	0.0	A	0	52	716.0	F	3725	1	45.8	D	900	1	14.1	75	B

Notes:
1.Delay measured in sec/veh;
2.LOS-Level of Service
3.Queue lengths shown are in feet rounded to nearest 25 feet.
4. To obtain 2015 and 2035 volumes, existing volumes were grown at 1% per year growth rate

Mainline Railroad Crossing Delay Analysis
PM Peak hour Delay and LOS
Miami-Dade County

US 1/Biscayne Blvd Crossing_Opening Year 2015 Conditions

Approach/Movement	Normal Signal Cycle				Freight Train Crossing Cycle				Passenger Train Crossing Cycle				Weighted Average		
	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	Queue	LOS
US 1 Biscayne Blvd @ NE 6th St															
Overall Intersection	14.9	B		38	98.0	F		1	28.4	C		1	17.3		B
NB Approach	11.6	B	200	38	139.0	F	1125	1	21.3	C	275	1	15.0	225	B
SB Approach	18.2	B	125	38	84.1	F		1	25.7	C		1	20.0		B
US 1 Biscayne Blvd @ FEC RR Crossing															
NB Approach	0.0	A	0	38	257.8	F		1	37.2	D		1	7.4		A
SB Approach	0.0	A	0	38	102.2	F	475	1	15.6	B	125	1	2.9	25	A

US 1/Biscayne Blvd Crossing_Build Out Year 2035 Conditions

Approach/Movement	Normal Signal Cycle				Freight Train Crossing Cycle				Passenger Train Crossing Cycle				Weighted Average		
	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	Queue	LOS
US 1 Biscayne Blvd @ NE 6th St															
Overall Intersection	18.0	B		35	370.6	F		1	36.6	D		1	28.0		C
NB Approach	14.4	B	250	35	562.8	F	1850	1	22.9	C	350	1	29.5	300	C
SB Approach	20.3	C	175	35	355.4	F		1	52.8	D		1	30.2		C
US 1 Biscayne Blvd @ FEC RR Crossing															
NB Approach	0.0	A	0	35	808.0	F		1	40.6	D		1	22.9		C
SB Approach	0.0	A	0	35	176.4	F	650	1	16.1	B	150	1	5.2	25	A

NW 20th St Crossing_Opening Year 2015 Conditions

Approach/Movement	Normal Signal Cycle				Freight Train Crossing Cycle				Passenger Train Crossing Cycle				Weighted Average		
	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	Queue	LOS
NW 20th St @ Miami Ave															
Overall Intersection	9.0	A		35	46.3	D		1	20.6	C		1	10.3		B
EB Approach	9.6	A	125	35	132.6	F	775	1	16.3	B	200	1	13.1	150	B
WB Approach	8.6	A	75	35	11.9	B		1	1.6	A		1	8.5		A
NW 20th St @ FEC RR Crossing															
EB Approach	0.0	A	0	35	76.6	E		1	17.2	B		1	2.5		A
WB Approach	0.0	A	0	35	106.7	F	300	1	14.7	B	75	1	3.3	25	A

NW 20th St Crossing_Buildout Year 2035 Conditions

Approach/Movement	Normal Signal Cycle				Freight Train Crossing Cycle				Passenger Train Crossing Cycle				Weighted Average		
	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	LOS	Queue	Cycles/Hour	Delay	Queue	LOS
NW 20th St @ Miami Ave															
Overall Intersection	10.6	B		35	199.3	F		1	22.4	C		1	16.0		B
EB Approach	11.8	B	200	35	445.7	F	1500	1	17.1	B	250	1	23.7	225	C
WB Approach	10.1	B	100	35	402.0	F		1	1.7	A		1	20.5		C
NW 20th St @ FEC RR Crossing															
EB Approach	0.0	A	0	35	264.5	F		1	17.2	B		1	7.6		A
WB Approach	0.0	A	0	35	155.8	F	450	1	15.0	B	100	1	4.6	25	A

Notes:
1.Delay measured in sec/veh;
2.LOS-Level of Service
3.Queue lengths shown are in feet rounded to nearest 25 feet.
4. To obtain 2015 and 2035 volumes, existing volumes were grown at 1% per year growth rate

Florida East Coast Railway

Development of Passenger Rail Service from Downtown West Palm Beach to Downtown Miami

Traffic Study for Proposed Stations

1. Introduction

Florida East Coast Railway (FEC) is proposing to develop passenger rail service from downtown West Palm Beach to downtown Miami. The service will include stations at West Palm Beach, Fort Lauderdale, and Miami. This memorandum documents traffic analysis for each of the three stations to evaluate their impact on adjacent roadway system.

2. Proposed Land Uses

Following land uses are being proposed at the stations:

West Palm Beach Station:

- 10,000 square foot retail within the station

Fort Lauderdale Station:

- 10,000 square foot retail within the station

Miami Station:

- 30,000 square foot retail within the station,
- 75,000 square foot retail
- 300,000 square foot office
- 200-room hotel
- 400-resdential units

3. Station Access

Station access points for each of the stations as follows:

West Palm Beach North-Access to Quadrille St and 6th St

West Palm Beach Central-Access to Evernia St

Fort Lauderdale North-Access to Brickell Ave

Fort Lauderdale South-Access to SE 2nd St

Miami Central Elevated-Access to NW 1st Ave

Miami South At-grade-Access to NW 1st Ave/NE 1st St

Exhibits showing the access and conceptual plans for the stations are attached with this memorandum.

3. Daily Boarding and Ridership

Daily boarding forecast for the year 2030 for the proposed stations are based on *All Aboard Florida (AAF) Ridership and Revenue Forecasts*. Year 2030 daily boarding volumes by station access mode are presented in **Table 1**.

TABLE 1
2030 DAILY BOARDINGS AT AAF STATIONS
STATION ACCESS MODE SPLT AND VOLUMES

AAF Station	Daily Boardings	Private Auto Park and Ride	Private Auto Drop-Off	Total Private Auto	Taxi	Transit/ Shuttle	Walk	Bike	Total
West Palm Beach		22%	13%	35%	2%	24%	37%	2%	**100%**
Fort Lauderdale		18%	9%	27%	2%	37%	32%	2%	**100%**
Miami		16%	6%	22%	4%	38%	34%	2%	**100%**
West Palm Beach	1,699	374	221	595	34	408	629	34	**1,700**
Fort Lauderdale	953	172	86	257	19	353	305	19	**953**
Miami	2,477	396	149	545	99	941	842	50	**2,477**
Total	**5,129**	**942**	**456**	**1,397**	**152**	**1,702**	**1,776**	**103**	**5,130**

1. Source: Daily Boardings from AAF Ridership and Revenue Forecast
2. Station Access Modal Split adapted from Transit Cooperative Research Report 153 - Guidelines for Providing Access to Public Transportation Stations, 2012.

4. Trip Generation

Trip generation estimates at each station consists of trips generated by the proposed land uses at each station and the trips associated with the forecasted boarding and ridership data. Trips for retail, office, and hotel land uses were estimated using the *Institute of Transportation Engineers (ITE) Trip Generation, 8th Edition.* Summary of the trip generation for each of the stations is presented in **Table 2**. A detailed Trip Generation Memorandum was also prepared.

TABLE 2
TRIP GENERATION SUMMARY FOR PROPOSED STATIONS (NET NEW TRIPS)

Description	Daily			AM Peak Hour			PM Peak Hour		
	In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
WEST PALM BEACH STATION									
Retail Trips	182	182	364	24	16	40	16	17	33
Ridership/Boarding Trips	656	656	1,312	197	197	394	197	197	394
TOTAL	**838**	**838**	**1,676**	**221**	**213**	**434**	**213**	**214**	**427**
FORT LAUDERDALE STATION									
Retail Trips	182	182	364	24	16	40	16	17	33
Ridership/Boarding Trips	300	300	600	90	90	180	90	90	180
TOTAL	**482**	**482**	**964**	**114**	**106**	**220**	**106**	**107**	**213**
MIAMI STATION									
Office/Retail/Hotel/ Residential Trips	4,591	4,591	9,182	612	263	875	364	557	921
Ridership/Boarding Trips	707	707	1,414	212	212	424	212	212	424
TOTAL	**5,298**	**5,298**	**10,596**	**824**	**475**	**1,299**	**576**	**769**	**1,345**

1. See the attached trip generation sheets for detailed trip generation, internal capture, and pass-by calculations.
2. Daily Boardings information is obtained from AAF Ridership and Revenue Forecast
3. Station Access Modal Split adapted from Transit Cooperative Research Report 153 - Guidelines for Providing Access to Public Transportation Stations, 2012.
4. Peak hour boardings are assumed to be 30% of the daily boardings based on the information from TRB's Commuter & Light Rail Transit Corridors, March 1996.

5. Trip Distribution

Traffic from the proposed train stations was manually distributed to surrounding roadways based on surrounding land uses, roadway network and existing traffic characteristics. All roadways within half-mile radius from proposed stations were studied. At the proposed railroad stations where streets are proposed to be closed, the vehicular traffic is re-routed to the adjacent streets. For example, in the proposed Miami At-grade Station, NW 3rd Street, between NW 2nd Avenue and NW 1st Avenue is proposed to be closed. The traffic from NW 3rd Street that is proposed to be closed is rerouted to NW 2nd Avenue south to NE/NW 1st Street and north to NE 5th Street continuing eastward to NW 1st Avenue where it connects with 3rd Street.

6. Traffic Analysis

Roadway segments were analyzed for opening year 2015 and build out year 2035. Future background traffic volumes were obtained from the 2035 Southeast Florida Regional Planning Model (SERPM). Year 2015 background volumes were developed by interpolating existing and 2035 volumes. Once the background traffic was developed, the project trips based on distribution were added to background trips

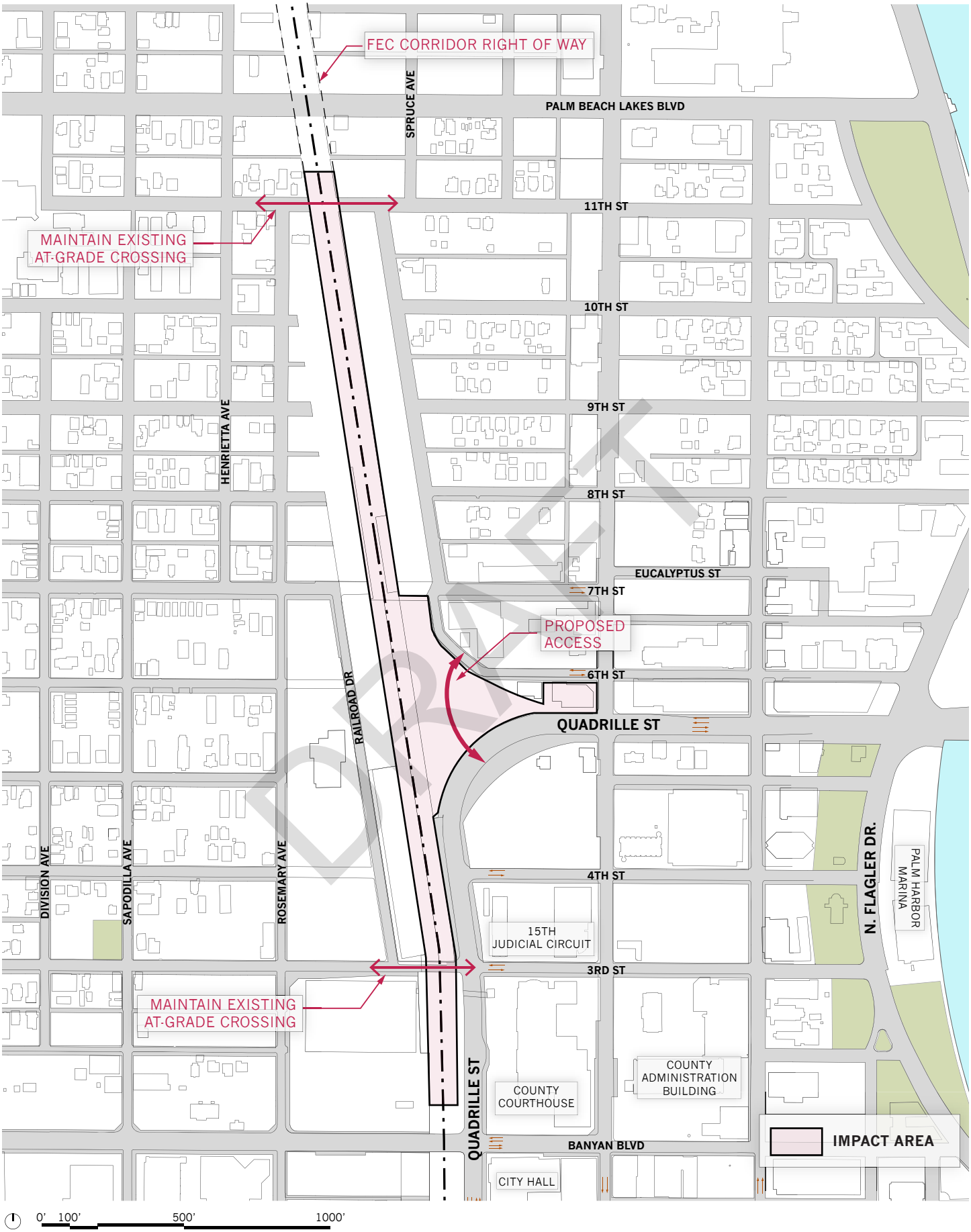
to obtain total future volume on each link. Reasonableness checks were completed to make sure the future volumes were higher than existing volumes for all roadway segments. In cased where model has predicted negative growth rate, the future volumes were adjusted to grow at 1% per year growth rate. Total daily volumes were compared to roadway capacities based on number lanes and Florida Department of Transportation *Generalized Service Volumes* applicable for urbanized areas. Level of service for each of the segment was determined by comparing the total daily volume on the segment to daily capacity from FDOT generalized tables. Worksheets showing the analysis results for each of the stations are attached to this memorandum.

To evaluate the impact of the station on each of the study area roadway segments, the percentage of the total capacity consumed by the project traffic was calculated. The segments along which project traffic consumes 5% or more of the capacity were identified as being impacted.

7. Summary

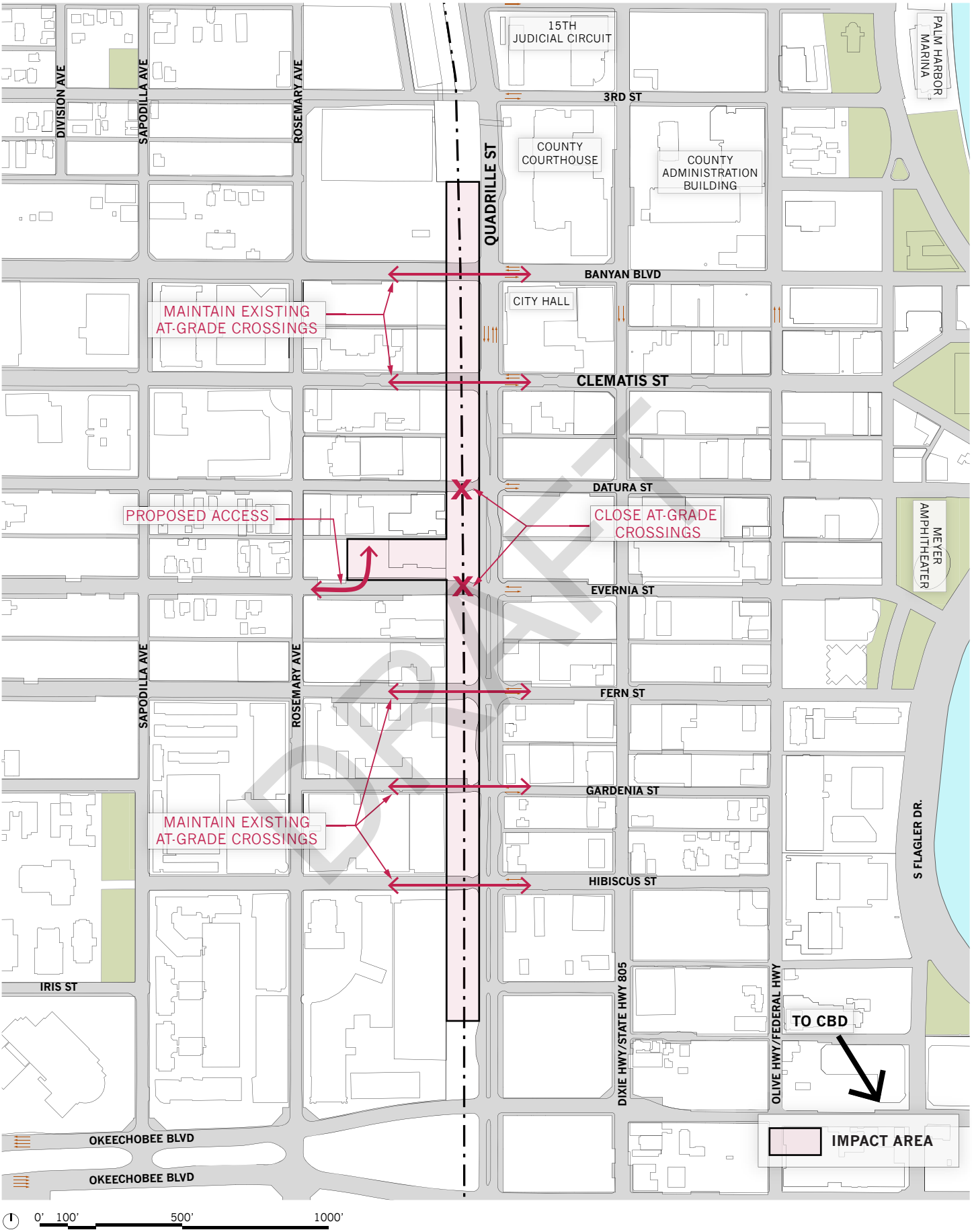
Based on the analysis, it appears that the project traffic generated by the proposed stations is minor compared to existing traffic and roadway capacities in the study area. Therefore proposed stations would not have any significant impact on adjacent roadways except for one segment near the Miami station. Summary of the results is provided below:

- West Palm Beach Stations-No significant impact
- Ft Lauderdale Stations-No significant impact
- Miami Stations-No significant impacts except for NW 1st St/Arena Blvd between NE 6th St and NE 10th St which is expected operate at LOS F. Since this segment provides direct access to the proposed station, this impact would be further evaluated as part of access management during design phase.



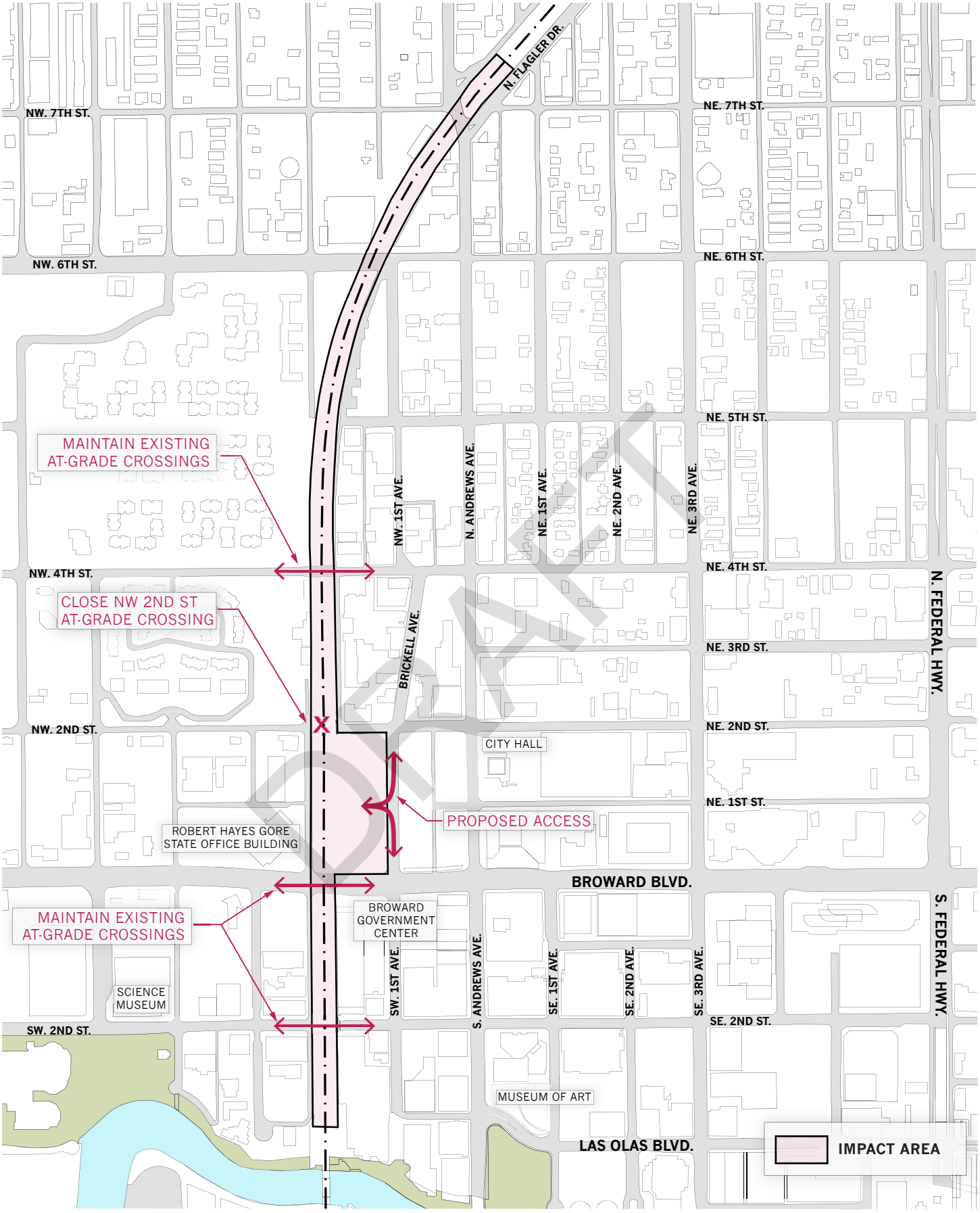
July 24, 2012

WEST PALM BEACH - NORTH
SITE LOCATION PLAN



July 24, 2012

WEST PALM BEACH - CENTRAL
SITE LOCATION PLAN

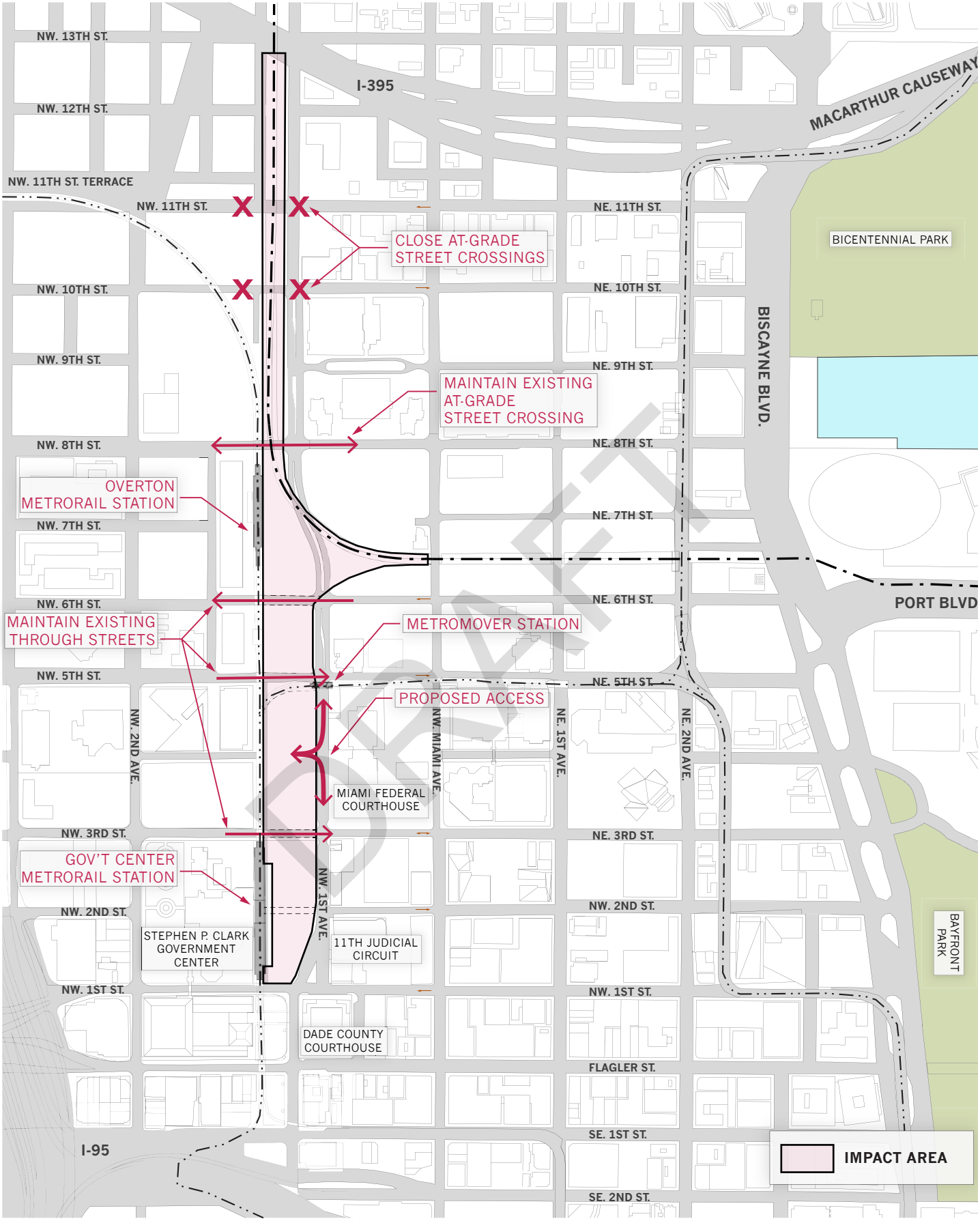


July 24, 2012

FT. LAUDERDALE - NORTH
SITE LOCATION PLAN

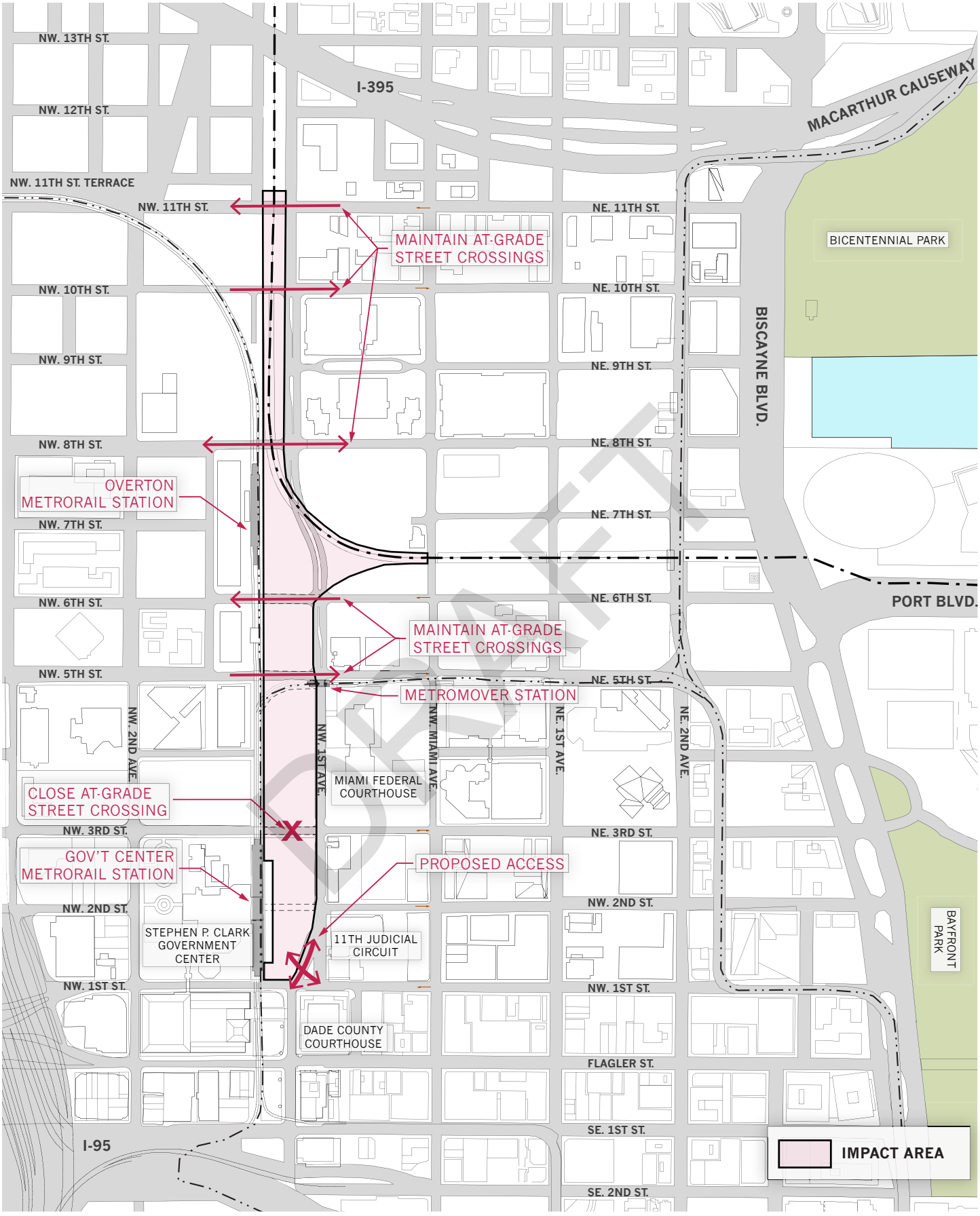
July 24, 2012

FT. LAUDERDALE - SOUTH
SITE LOCATION PLAN



July 24, 2012

MIAMI - CENTRAL ELEVATED
SITE LOCATION PLAN



July 24, 2012

MIAMI - SOUTH AT GRADE
SITE LOCATION PLAN

WPB North Station
Existing, Future Background, and Total LOS and Project Impact

Roadway	From	To	Existing				2015 Opening				2035 Buildout								
			Lanes	Capacity	ADT	LOS	Background	Project	Total	LOS	Background	Lanes	Capacity	LOS without Project	Project	Total	LOS with Project	Project Impact %	Significant Impact?
Quadrille Blvd	Okeechobee Blvd	Fern St	4	36700	12300	B	14100	235	14335	B	26300	4	36700	B	235	26535	B	0.64%	NO
	Fern St	Banyan Blvd	4	36700	9600	B	11100	419	11519	B	21000	4	36700	B	419	21419	B	1.14%	NO
	Banyan Blvd	FEC Station	4	36700	10900	B	11800	670	12470	B	18100	4	36700	B	670	18770	B	1.83%	NO
	FEC Station	Dixie Hwy	4	36700	10900	B	11000	922	11922	B	11700	4	36700	B	922	12622	B	2.51%	NO
	Dixie Hwy	Olive Ave	4	36700	14200	B	14200	419	14619	B	14400	4	36700	B	419	14819	B	1.14%	NO
	Olive Ave	Flagler Memorial Bridge	4	36700	14200	B	14400	335	14735	B	15800	4	36700	B	335	16135	B	0.91%	NO
Banyan Blvd/1st St	Tamarind Ave	Quadrille Blvd	4	36700	11600	B	13500	251	13751	B	26300	4	36700	B	251	26551	B	0.68%	NO
	Quadrille Blvd	Flagler Dr	4	36700	9300	B	10100	67	10167	B	15500	4	36700	B	67	15567	B	0.18%	NO
Okeechobee Blvd	Tamarind Ave	Dixie Hwy	8	73800	40000	B	46600	251	46851	B	90500	8	73800	F	251	90751	F	0.34%	NO
	Dixie Hwy	Flagler Dr	6	55300	19600	B	20600	84	20684	B	27500	6	55300	B	84	27584	B	0.15%	NO
Palm Beach Lakes Blvd	Tamarind Ave	Dixie Hwy	4	36700	22900	B	23200	285	23485	B	25400	4	36700	B	285	25685	B	0.78%	NO
	Dixie Hwy	Flagler Dr	4	36700	6700	B	7000	50	7050	B	9200	4	36700	B	50	9250	B	0.14%	NO
Tamarind Ave	Okeechobee Blvd	Banyan Blvd / 1st St	4	36700	14800	B	16400	117	16517	B	27300	4	36700	B	117	27417	B	0.32%	NO
	Banyan Blvd / 1st St	Palm Beach Lakes Blvd	2	16500	6100	B	6300	101	6401	B	7700	2	16500	B	101	7801	B	0.61%	NO
Dixie Hwy	Okeechobee Blvd	Banyan Blvd / 1st St	2	22020	7500	B	9200	84	9284	B	20500	2	22020	D	84	20584	D	0.38%	NO
	Banyan Blvd / 1st St	Quadrille Blvd	4	36700	8900	B	10200	50	10250	B	18700	4	36700	B	50	18750	B	0.14%	NO
	Quadrille Blvd	Palm Beach Lakes Blvd	4	36700	21000	B	21800	84	21884	B	27000	4	36700	B	84	27084	B	0.23%	NO
Olive Ave	Okeechobee Blvd	Banyan Blvd / 1st St	2	22020	13700	C	14500	117	14617	C	20100	2	22020	D	117	20217	D	0.53%	NO
	Banyan Blvd / 1st St	Quadrille Blvd	2	22020	4200	B	5900	67	5967	B	16900	2	22020	D	67	16967	D	0.30%	NO
	Quadrille Blvd	Palm Beach Lakes Blvd	2	16500	2600	B	4100	101	4201	B	13900	2	16500	C	101	14001	C	0.61%	NO
Flagler Dr	Okeechobee Blvd	Banyan Blvd / 1st St	4	36700	15000	B	15500	84	15584	B	18500	4	36700	B	84	18584	B	0.23%	NO
	Banyan Blvd / 1st St	Quadrille Blvd	4	36700	21500	B	22100	84	22184	B	26400	4	36700	B	84	26484	B	0.23%	NO
	Quadrille Blvd	Palm Beach Lakes Blvd	4	36700	21500	B	22100	101	22201	B	26400	4	36700	B	101	26501	B	0.28%	NO

Notes:

1. Existing ADTs are obtained from FDOT and Palm Beach County sources. Some counts are from 2010 and 2011.
2. Future background ADT is obtained from 2035 Southeast Florida Regional Planning Model (SERPM).
3.Project traffic was manually distributed to surrounding roadways considering future background traffic, land uses, and roadway connectivity.
4.Where the future background volume was lower than the existing count, the future background volume was manually adjusted with a growth rate of 1% per year
5. Opening year background volume was obtained by interpolating existing and future volumes.
6. Project traffic for opening year was assumed to be same as build out year as most of the land uses are expected to built by opening year.
7. Capacity is based on FDOT's Generalized Annual Average Daily Volumes for urbanized areas.
8. Project impact is the percentage of roadway capacity consumed by project trips
9. Impact was assumed to be significant if it is more than 5%.
10. Capacities and LOS are based on daily volumes
11. For 2015, number of lanes are assumed same as existing. For 2035 number of lanes are based on the cost-feasible SERPM model

WPB Central Station
Existing, Future Background, and Total LOS and Project Impact

Roadway	From	To	Existing				2015 Opening				2035 Buildout								
			Lanes	Capacity	ADT	LOS	Background	Project	Total	LOS	Background	Lanes	Capacity	LOS without Project	Project	Total	LOS with Project	Project Impact %	Significant Impact?
Quadrille Blvd	Okeechobee Blvd	Fern St	4	36700	12300	B	14100	168	14268	B	26300	4	36700	B	168	26468	B	0.46%	NO
	Fern St	Banyan Blvd	4	36700	9600	B	11100	335	11435	B	21000	4	36700	B	335	21335	B	0.91%	NO
	Banyan Blvd	Flagler Memorial Bridge	4	36700	10900	B	11800	168	11968	B	18100	4	36700	B	168	18268	B	0.46%	NO
Banyan Blvd/1st St	Tamarind Ave	Quadrille Blvd	4	36700	11600	B	13500	168	13668	B	26300	4	36700	B	168	26468	B	0.46%	NO
	Quadrille Blvd	Flagler Dr	4	36700	9300	B	10100	117	10217	B	15500	4	36700	B	117	15617	B	0.32%	NO
Clemantis St	Tamarind Ave	Quadrille Blvd	2	16500	2800	B	2900	168	3068	B	3500	2	16500	B	168	3668	B	1.02%	NO
	Quadrille Blvd	Flagler Dr	2	16500	3400	B	3500	251	3751	B	4100	2	16500	B	251	4351	B	1.52%	NO
Fern St	Tamarind Ave	Quadrille Blvd	2	16500	2000	B	2500	335	2835	B	6000	2	16500	B	335	6335	B	2.03%	NO
	Quadrille Blvd	Flagler Dr	2	16500	1500	B	1700	168	1868	B	3200	2	16500	B	168	3368	B	1.02%	NO
Okeechobee Blvd	Tamarind Ave	Dixie Hwy	8	73800	40000	B	46600	168	46768	B	90500	8	73800	F	168	90668	F	0.23%	NO
	Dixie Hwy	Flagler Dr	6	55300	19600	B	20600	84	20684	B	27500	6	55300	B	84	27584	B	0.15%	NO
Palm Beach Lakes Blvd	Tamarind Ave	Dixie Hwy	4	36700	22900	B	23200	168	23368	B	25400	4	36700	B	168	25568	B	0.46%	NO
	Dixie Hwy	Flagler Dr	4	36700	6700	B	7000	50	7050	B	9200	4	36700	B	50	9250	B	0.14%	NO
Tamarind Ave	Okeechobee Blvd	Evernia St	4	36700	14800	B	16400	117	16517	B	27300	4	36700	B	117	27417	B	0.32%	NO
	Evernia St	Palm Beach Lakes Blvd	2	16500	6100	B	6300	168	6468	B	7700	2	16500	B	168	7868	B	1.02%	NO
Dixie Hwy	Okeechobee Blvd	Banyan Blvd / 1st St	2	22020	7500	B	9200	101	9301	B	20500	2	22020	D	101	20601	D	0.46%	NO
	Banyan Blvd / 1st St	Quadrille Blvd	4	36700	8900	B	10200	50	10250	B	18700	4	36700	B	50	18750	B	0.14%	NO
	Quadrille Blvd	Palm Beach Lakes Blvd	4	36700	21000	B	21800	101	21901	B	27000	4	36700	B	101	27101	B	0.28%	NO
Olive Ave	Okeechobee Blvd	Banyan Blvd / 1st St	2	22020	13700	C	14500	117	14617	C	20100	2	22020	D	117	20217	D	0.53%	NO
	Banyan Blvd / 1st St	Quadrille Blvd	2	22020	4200	B	5900	67	5967	B	16900	2	22020	D	67	16967	D	0.30%	NO
	Quadrille Blvd	Palm Beach Lakes Blvd	2	16500	2600	B	4100	101	4201	B	13900	2	16500	C	101	14001	C	0.61%	NO
Flagler Dr	Okeechobee Blvd	Banyan Blvd / 1st St	4	36700	15000	B	15500	84	15584	B	18500	4	36700	B	84	18584	B	0.23%	NO
	Banyan Blvd / 1st St	Quadrille Blvd	4	36700	21500	B	22100	84	22184	B	26400	4	36700	B	84	26484	B	0.23%	NO
	Quadrille Blvd	Palm Beach Lakes Blvd	4	36700	21500	B	22100	101	22201	B	26400	4	36700	B	101	26501	B	0.28%	NO

Notes:

1. Existing ADTs are obtained from FDOT and Palm Beach County sources. Some counts are from 2010 and 2011.
2. Future background ADT is obtained from 2035 Southeast Florida Regional Planning Model (SERPM).
3.Project traffic was manually distributed to surrounding roadways considering future background traffic, land uses, and roadway connectivity.
4.Where the future background volume was lower than the existing count, the future background volume was manually adjusted with a growth rate of 1% per year
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6. Project traffic for opening year was assumed to be same as build out year as most of the land uses are expected to built by opening year.
7. Capacity is based on FDOT's Generalized Annual Average Daily Volumes for urbanized areas.
8. Project impact is the percentage of roadway capacity consumed by project trips
9. Impact was assumed to be significant if it is more than 5%.
10. Capacities and LOS are based on daily volumes
11. For 2015, number of lanes are assumed same as existing. For 2035 number of lanes are based on the cost-feasible SERPM model

Fort Lauderdale-FEC Stations
Existing, Future Background, and Total LOS and Project Impact

Roadway	From	To	Existing				2015 Opening				2035 Buildout								
			Lanes	Capacity	ADT	LOS	Background	Project	Total	LOS	Background	Lanes	Capacity	LOS without Project	Project	Total	LOS with Project	Project Impact %	Significant Impact?
Broward Blvd	NW 9th Ave	Avenue of the Arts	6	55300	57000	F	58700	96	58796	F	70100	6	55300	F	96	70196	F	0.17%	NO
	Avenue of the Arts	S Andrews Ave	6	55300	50500	C	52000	289	52289	C	62100	6	55300	F	289	62389	F	0.52%	NO
	S Andrews Ave	NE 3rd Ave	6	55300	33500	B	34500	337	34837	B	41200	6	55300	B	337	41537	B	0.61%	NO
	NE 3rd Ave	S Federal Hwy	6	55300	37000	B	38100	193	38293	B	45500	6	55300	B	193	45693	B	0.35%	NO
NW 6th St	NW 9th Ave	Avenue of the Arts	4	36700	16200	B	17900	48	17948	B	29300	4	36700	C	48	29348	C	0.13%	NO
	Avenue of the Arts	S Andrews Ave	4	36700	12400	B	15200	77	15277	B	33900	4	36700	C	77	33977	C	0.21%	NO
	S Andrews Ave	NE 3rd Ave	2	16500	4700	B	6400	48	6448	B	17800	2	16500	F	48	17848	F	0.29%	NO
	NE 3rd Ave	S Federal Hwy	2	16500	4700	B	5700	48	5748	B	12200	2	16500	C	48	12248	C	0.29%	NO
SW 2nd St	S Andrews Ave	S Federal Hwy	2	16500	7100	B	7600	67	7667	B	11100	2	16500	C	67	11167	C	0.41%	NO
E Las Olas Blvd	S Andrews Ave	NE 3rd Ave	4	36700	9700	B	9800	145	9945	B	10600	4	36700	B	145	10745	B	0.40%	NO
	NE 3rd Ave	S Federal Hwy	4	36700	14600	B	15600	48	15648	B	22000	4	36700	B	48	22048	B	0.13%	NO
SE 7th St	S Andrews Ave	NE 3rd Ave	2	16500	3600	B	4500	77	4577	B	10600	2	16500	C	77	10677	C	0.47%	NO
	NE 3rd Ave	S Federal Hwy	2	16500	3600	B	4600	48	4648	B	10900	2	16500	C	48	10948	C	0.29%	NO
S Andrews Ave	SE 7th St	Broward Blvd	4	36700	20400	B	21500	337	21837	B	28800	4	36700	B	337	29137	B	0.92%	NO
	Broward Blvd	NW 6th St	4	36700	20400	B	21000	193	21193	B	24800	4	36700	B	193	24993	B	0.53%	NO
NE 3rd Ave	SE 7th St	Broward Blvd	4	36700	23000	B	25000	48	25048	B	38600	4	36700	F	48	38648	F	0.13%	NO
	Broward Blvd	NW 6th St	4	36700	23000	B	23400	145	23545	B	26000	4	36700	B	145	26145	B	0.40%	NO
Avenue of the Arts	SE 7th St	Broward Blvd	4	36700	14800	B	18300	96	18396	B	41600	4	36700	F	96	41696	F	0.26%	NO
	Broward Blvd	NW 6th St	4	36700	16800	B	19600	96	19696	B	38400	4	36700	F	96	38496	F	0.26%	NO
NW 9th Ave	Broward Blvd	NW 6th St	2	36700	3400	B	4700	48	4748	B	13200	2	36700	B	48	13248	B	0.13%	NO
S Federal Hwy	E Las Olas Blvd	Broward Blvd	6	55300	42500	B	43900	67	43967	B	53600	6	55300	C	67	53667	C	0.12%	NO
	Broward Blvd	NW 6th St	6	55300	41500	B	42800	96	42896	B	51100	6	55300	C	96	51196	C	0.17%	NO

Notes:

1. Existing ADTs are obtained from FDOT and Broward County sources. Some counts are from 2010 and 2011.
2. Future background ADT is obtained from 2035 Southeast Florida Regional Planning Model (SERPM).
3.Project traffic was manually distributed to surrounding roadways considering future background traffic, land uses, and roadway connectivity.
4.Where the future background volume was lower than the existing count, the future background volume was manually adjusted with a growth rate of 1% per year
5. Opening year background volume was obtained by interpolating existing and future volumes.
6. Project traffic for opening year was assumed to be same as build out year as most of the land uses are expected to built by opening year.
7. Capacity is based on FDOT's Generalized Annual Average Daily Volumes for urbanized areas.
8. Project impact is the percentage of roadway capacity consumed by project trips
9. Impact was assumed to be significant if it is more than 5%.
10. Capacities and LOS are based on daily volumes
11. For 2015, number of lanes are assumed same as existing. For 2035 number of lanes are based on the cost-feasible SERPM model

Miami South At Grade FEC Station

Existing, Opening, Future, and Total ADT Volumes and Level of Service

	Direction		Segment		Daily Background Traffic (AADT)			Daily Traffic (AADT) With Project				Level of Service (LOS)								Significant	Adverse
															2015		2035		Project Traffic	Impact (6)	Impact (7)
Rail Station	of Travel	Road	From	To	2011 (3)	2015 (2)	2035 (4)	Project % (5)	Project	2015 Total	2035 Total	Lanes	Capacity (8)	2011	Background	Total	Background	Total	% of Capacity	(Yes/No)	(Yes/No)
Miami	E/W	Flagler St.	NW 2nd Ave.	NW 1st Ave.	15,400	16,200	20,200	10%	1,060	17,260	21,260	4	25,500	D	D	D	D	D	4.2%	No	No
South At Grade			NW 1st Ave.	Miami Ave.	15,600	16,400	20,500	20%	2,119	18,519	22,619	4	25,500	D	D	D	D	D	8.3%	Yes	No
Station			Miami Ave.	SE/NE 1st Ave/17th St.	14,000	14,700	18,400	20%	2,119	16,819	20,519	4	25,500	D	D	D	D	D	8.3%	Yes	No
			SE/NE 1st Ave/17th St.	2nd Ave.	12,000	12,600	15,800	15%	1,589	14,189	17,389	4	25,500	D	D	D	D	D	6.2%	Yes	No
			2nd Ave.	US 1	8,700	9,100	11,400	10%	1,060	10,160	12,460	4	25,500	D	D	D	D	D	4.2%	No	No
	E/W	NW 1st St.	NW 2nd Ave.	NW 1st Ave.	4,600	7,000	19,200	5%	530	7,530	19,730	4 (one-way) WB	36,900	B	B	B	B	B	1.4%	No	No
			NW 1st Ave.	Miami Ave.	7,100	7,500	9,400	10%	1,060	8,560	10,460	4 (one-way) WB	36,900	B	B	B	B	B	2.9%	No	No
			Miami Ave.	SE/NE 1st Ave/17th St.	6,700	7,000	8,800	20%	2,119	9,119	10,919	2 (one-way) WB	22,000	B	B	B	B	B	9.6%	Yes	No
			SE/NE 1st Ave/17th St.	2nd Ave.	6,800	7,200	9,000	15%	1,589	8,789	10,589	2 (one-way) WB	22,000	B	B	B	B	B	7.2%	Yes	No
			2nd Ave.	US 1	3,200	3,400	4,200	10%	1,060	4,460	5,260	2 (one-way) WB	22,000	B	B	B	B	B	4.8%	No	No
	E/W	NE 3rd St	NW 3rd Ave	NW 2nd Ave.	9,200	9,700	12,100	0%	0	9,700	12,100	2	16,500	C	C	C	C	C	0.0%	No	No
			NW 2nd Ave. (1)	NW 1st Ave. (1)	6,800	7,100	8,900	0%	0	7,100	8,900	2	16,500	B	B	B	B	B	0.0%	No	No
			NW 1st Ave.	Miami Ave.	9,100	9,600	12,000	0%	0	9,600	12,000	2 (one-way) WB	22,000	B	B	B	B	B	0.0%	No	No
			Miami Ave.	SE/NE 1st Ave/17th St.	10,400	11,000	13,700	0%	0	11,000	13,700	2 (one-way) WB	22,000	B	B	B	B	B	0.0%	No	No
			SE/NE 1st Ave/17th St.	2nd Ave.	8,200	8,600	10,800	0%	0	8,600	10,800	2 (one-way) WB	22,000	B	B	B	B	B	0.0%	No	No
			2nd Ave.	US 1	2,000	2,100	2,600	0%	0	2,100	2,600	2 (one-way) WB	22,000	B	B	B	B	B	0.0%	No	No
	E/W	NE 5th St.	NW 3rd Ave.	NW 2nd Ave.	14,400	15,100	18,900	0%	0	15,100	18,900	3 (one-way) EB	27,500	B	B	B	B	B	0.0%	No	No
			NW 2nd Ave. (1)	NW 1st Ave. (1)	15,900	16,700	20,900	10%	1,060	17,760	25,860	3 (one-way) EB	27,500	B	B	B	B	D	3.9%	No	No
			NW 1st Ave.	Miami Ave.	19,400	20,400	25,500	10%	1,060	21,460	26,560	3 (one-way) EB	27,500	B	C	C	C	E	3.9%	No	No
			Miami Ave.	SE/NE 1st Ave/17th St.	10,500	11,000	13,800	10%	1,060	12,060	14,860	3 (one-way) EB	27,500	B	B	B	B	B	3.9%	No	No
			SE/NE 1st Ave/17th St.	2nd Ave.	9,100	9,800	12,000	10%	1,060	10,860	13,060	3 (one-way) EB	27,500	B	B	B	B	B	3.9%	No	No
			2nd Ave.	US 1	9,900	11,000	16,300	10%	1,060	12,060	17,360	3 (one-way) EB	27,500	B	B	B	B	B	3.9%	No	No
	E/W	NE 6th St.	NW 2nd Ave.	NW 1st Ave.	3,900	5,000	16,900	10%	1,060	6,060	17,960	2 (one-way) WB	22,000	B	B	B	B	C	4.8%	No	No
			NW 1st Ave.	Miami Ave.	17,600	18,600	23,200	10%	1,060	19,660	24,260	2 (one-way) WB	22,000	C	C	C	F	F	4.8%	No	No
			Miami Ave.	SE/NE 1st Ave/17th St.	17,300	18,200	22,700	10%	1,060	19,260	23,760	2 (one-way) WB	22,000	B	C	C	F	F	4.8%	No	No
			SE/NE 1st Ave/17th St.	2nd Ave.	13,500	14,600	19,800	10%	1,060	15,660	20,860	2 (one-way) WB	22,000	B	B	B	B	B	4.8%	No	No
			2nd Ave.	US 1	23,700	25,000	31,200	5%	530	25,530	31,730	3 (one-way) WB	27,500	C	C	C	F	F	1.9%	No	No
	E/W	NE 10th St.	NW 3rd Ave.	NW 2nd Ave.	4,900	5,900	10,700	0%	0	5,900	10,700	2 (one-way) EB	22,000	B	B	B	B	B	0.0%	No	No
			NW 2nd Ave.	NW 1st Ave.	2,000	4,500	12,000	0%	0	4,500	12,000	2 (one-way) EB	22,000	B	B	B	B	B	0.0%	No	No
			NW 1st Ave.	Miami Ave.	10,900	11,400	14,300	10%	1,060	12,460	15,360	2 (one-way) EB	22,000	B	B	B	B	B	4.8%	No	No
			Miami Ave.	SE/NE 1st Ave/17th St.	7,500	7,900	9,900	10%	1,060	8,960	10,960	2 (one-way) EB	22,000	B	B	B	B	B	4.8%	No	No
			SE/NE 1st Ave/17th St.	2nd Ave.	7,400	7,800	9,700	10%	1,060	8,860	10,760	2 (one-way) EB	22,000	B	B	B	B	B	4.8%	No	No
			2nd Ave.	US 1	12,200	12,900	16,100	5%	530	13,430	16,630	2 (one-way) EB	22,000	B	B	B	B	B	2.4%	No	No
	E/W	NE 11th St.	NW 2nd Ave.	NW 1st Ave.	1,900	3,400	10,800	10%	1,060	4,460	11,860	2 (one-way) WB	22,000	B	B	B	B	B	4.8%	No	No
			NW 1st Ave.	Miami Ave.	9,500	10,000	12,500	5%	530	10,530	13,030	2 (one-way) WB	22,000	B	B	B	B	B	2.4%	No	No
			Miami Ave.	SE/NE 1st Ave/17th St.	9,800	10,300	12,900	5%	530	10,830	13,430	2 (one-way) WB	22,000	B	B	B	B	B	2.4%	No	No
			SE/NE 1st Ave/17th St.	2nd Ave.	10,500	11,000	13,800	5%	530	11,530	14,330	2 (one-way) WB	22,000	B	B	B	B	B	2.4%	No	No
			2nd Ave.	US 1	9,100	9,600	12,000	5%	530	10,130	12,530	2 (one-way) WB	22,000	B	B	B	B	B	2.4%	No	No
	N/S	US 1	SE 1st St	Flagler St.	36,800	39,100	50,400	5%	530	39,630	50,930	8	64,700	D	D	D	D	D	0.8%	No	No
			Flagler St.	NW 1st St.	38,500	40,500	50,600	5%	530	41,030	51,130	8	64,700	D	D	D	D	D	0.8%	No	No
			NW 1st St.	NW 3rd St.	39,700	41,800	52,200	5%	530	42,330	52,730	8	64,700	D	D	D	D	D	0.8%	No	No
			NW 3rd St.	NE 5th St.	38,900	41,000	51,200	5%	530	41,530	51,730	8	64,700	D	D	D	D	D	0.8%	No	No
			NE 5th St.	NE 6th St.	43,500	45,800	57,200	5%	530	46,330	57,730	8	64,700	D	D	D	D	D	0.8%	No	No
			NE 6th St.	NE 10th St.	44,000	46,600	59,400	10%	1,060	47,660	60,460	8	64,700	D	D	D	E	E	1.6%	Yes	No
			NE 10th St.	NE 11th St.	41,200	43,400	54,200	5%	530	43,930	54,730	8	64,700	D	D	D	D	D	0.8%	No	No
	N/S	SE 2nd Ave.	NW 1st St.	NW 3rd St.	18,500	19,500	24,400	5%	530	20,030	24,930	3 (one-way) SB	27,500	D	D	D	D	D	1.9%	No	No
			NW 3rd St.	NE 5th St.	22,800	24,000	30,000	10%	1,060	25,060	31,060	3 (one-way) SB	27,500	D	D	D	F	F	3.9%	Yes	No
			NE 5th St.	NE 6th St.	26,300	27,700	34,600	0%	0	27,700	34,600	3 (one-way) SB	27,500	D	D	D	F	F	0.0%	Yes	No
			NE 6th St.	NE 10th St.	19,000	20,100	25,700	0%	0	20,100	25,700	3 (one-way) SB	27,500	D	D	D	D	D	0.0%	No	No
			NE 10th St.	NE 11th St.	24,500	25,800	32,200	0%	0	25,800	32,200	3 (one-way) SB	27,500	D	D	D	F	F	0.0%	Yes	No
	N/S	SE/NE 1st Ave/17St.	SE 2nd St	SE 1st St	12,400	13,000	16,300	5%	530	13,530	16,830	3 (one-way) NB	27,500	D	D	D	D	D	1.9%	No	No

	Direction		Segment		Daily Background Traffic (AADT)			Daily Traffic (AADT) With Project				Level of Service (LOS)								Significant	Adverse
															2015		2035		Project Traffic	Impact (6)	Impact (7)
			SE 1st St	Flagler St.	14,300	15,000	18,800	10%	1,060	16,060	19,860	3 (one-way) NB	27,500	D	D	D	D	D	3.9%	No	No
			Flagler St.	NW 1st St.	13,100	13,800	17,200	20%	2,119	15,919	19,319	3 (one-way) NB	27,500	D	D	D	D	D	7.7%	Yes	No
			NW 1st St.	NW 3rd St.	13,200	13,900	17,400	0%	0	13,900	17,400	3 (one-way) NB	27,500	D	D	D	D	D	0.0%	No	No
			NW 3rd St.	NE 5th St.	11,900	13,700	22,600	0%	0	13,700	22,600	3 (one-way) NB	27,500	D	D	D	D	D	0.0%	No	No
			NE 5th St.	NE 6th St.	17,800	18,700	23,400	0%	0	18,700	23,400	3 (one-way) NB	27,500	D	D	D	D	D	0.0%	No	No
			NE 6th St.	NE 10th St.	16,000	17,300	24,000	0%	0	17,300	24,000	3 (one-way) NB	27,500	D	D	D	D	D	0.0%	No	No
			NE 10th St.	NE 11th St.	18,400	19,400	24,200	0%	0	19,400	24,200	3 (one-way) NB	27,500	D	D	D	D	D	0.0%	No	No
	N/S	Miami Ave.	SE 2nd St	SE 1st St	12,800	13,400	16,800	5%	530	13,930	17,330	3 (one-way) SB	27,500	D	D	D	D	D	1.9%	No	No
			SE 1st St	Flagler St.	10,400	11,000	13,700	10%	1,060	12,060	14,760	3 (one-way) SB	27,500	D	D	D	D	D	3.9%	No	No
			Flagler St.	NW 1st St.	6,500	6,900	8,600	10%	1,060	7,960	9,660	3 (one-way) SB	27,500	C	C	C	C	C	3.9%	No	No
			NW 1st St.	NW 3rd St.	12,800	13,400	16,800	0%	0	13,400	16,800	3 (one-way) SB	27,500	D	D	D	D	D	0.0%	No	No
			NW 3rd St.	NE 5th St.	16,700	17,600	22,000	10%	1,060	18,660	23,060	3 (one-way) SB	27,500	D	D	D	D	D	3.9%	No	No
			NE 5th St.	NE 6th St.	4,400	5,400	10,300	10%	1,060	6,460	11,360	3 (one-way) SB	27,500	C	C	C	C	C	3.9%	No	No
			NE 6th St.	NE 10th St.	11,000	11,600	14,500	10%	1,060	12,660	15,560	3 (one-way) SB	27,500	C	C	C	C	C	3.9%	No	No
			NE 10th St.	NE 11th St.	7,700	8,100	10,100	0%	0	8,100	10,100	3 (one-way) SB	27,500	C	C	C	C	C	0.0%	No	No
	N/S	NW 1st Ave./Arena Blvd.	SE 2nd St	SE 1st St	800	800	1,000	0%	0	800	1,000	4	31,900	C	C	C	C	C	0.0%	No	No
			SE 1st St	Flagler St.	900	1,000	1,200	50%	5,298	6,298	6,498	4	31,900	C	C	C	C	C	16.6%	Yes	No
			Flagler St.	NW 1st St.	1,800	1,900	2,400	50%	5,298	7,198	7,698	4	31,900	C	C	C	C	C	16.6%	Yes	No
			NW 1st St. at **Miami Station**	NW 3rd St.	6,200	6,300	6,600	50%	5,298	11,598	11,898	4	31,900	C	C	C	C	C	16.6%	Yes	No
			NW 3rd St. (1)	NE 5th St. (1)	5,100	5,400	6,700	50%	5,298	10,698	16,798	4	31,900	C	C	C	C	D	16.6%	Yes	No
			NE 5th St. (1)	NE 6th St. (1)	9,000	9,400	11,800	30%	3,179	12,579	14,779	4	31,900	C	C	C	C	D	10.0%	Yes	No
			NE 6th St.	NE 10th St.	14,900	16,900	26,700	20%	2,119	19,019	28,819	4	31,900	C	C	D	E		6.6%	Yes	Yes
			NE 10th St.	NE 11th St.	9,600	10,100	12,600	10%	1,060	11,160	13,660	2	16,500	B	C	C	C	C	6.4%	Yes	No

Notes:

(1) With closing of 3rd St., the background traffic is rerouted from 3rd St. located west of NW 1st Ave. to 2nd Ave. north to NW 5th St. and south to NW 1st St.

(2) Where traffic counts are not available, the 2011 and 2015 background traffic is derived by applying a 1% annual reduction of the 2035 AADT road segment volume

(3) Traffic Counts obtained from FDOT's 2011 Florida Transportation Information database and counts taken in 2011 for the FEC railroad traffic operational study.

(4) Future 2035 background ADT is obtained from the 2035 Cost Affordble Southeast Florida Regional Planning Model, SERPM Version 6.5.2e

(5) Project traffic was manually distributed based upon roadways considering future background traffic, land use , and road connectivity

(6) Significant impact is where the project consumes 5% of more of the road capacity

(7) Adverse impact is where the project consumes 5% or more of the road capacity and the road is anticipated to operate at LOS E or LOS F

(8) Capacity is based on FDOT's Generalized Annual Average Daily Service Volumes for urbanized areas where the number of lanes for 2015 is based upon the 2035 Cost Feasible Plan lanes obtained from the SERPM, Version 6.5.2.e model

Miami Central Elevated FEC Station

Existing, Opening, Future, and Total ADT Volumes and Level of Service

Rail Station	Direction of Travel	Road	Segment From	Segment To	Daily Background Traffic (ADT) 2011 (3)	2015 (2)	2035 (4)	Daily Traffic (ADT) With Project Project % (5)	Project	2015 Total	2035 Total	Lanes	Capacity (8)	Level of Service (LOS) 2011	2015 Background	2015 Total	2035 Background	2035 Total	Project Traffic % of Capacity	Significant Impact (6) (Yes/No)	Adverse Impact (7) (Yes/No)
Miami Central Elevated Station	E/W	Flagler St.	NW 2nd Ave.	NW 1st Ave.	15,400	16,200	20,200	10%	1,060	17,260	21,260	4	25,500	D	D	D	D	D	4.2%	No	No
			NW 1st Ave.	Miami Ave.	15,600	16,400	20,500	20%	2,119	18,519	22,619	4	25,500	D	D	D	D	D	8.3%	Yes	No
			Miami Ave.	SE/NE 1st Ave/17th St.	14,000	14,700	18,400	20%	2,119	16,819	20,519	4	25,500	D	D	D	D	D	8.3%	Yes	No
			SE/NE 1st Ave/17th St.	2nd Ave.	12,000	12,600	15,800	15%	1,589	14,189	17,389	4	25,500	D	D	D	D	D	6.2%	Yes	No
			2nd Ave.	US 1	8,700	9,100	11,400	10%	1,060	10,160	12,460	4	25,500	D	D	D	D	D	4.2%	No	No
	E/W	NW 1st St.	NW 2nd Ave.	NW 1st Ave.	4,600	7,000	19,200	5%	530	7,530	19,730	4 (one-way) WB	36,900	B	B	B	B	B	1.4%	No	No
			NW 1st Ave.	Miami Ave.	7,100	7,500	9,400	10%	1,060	8,560	10,460	4 (one-way) WB	36,900	B	B	B	B	B	2.9%	No	No
			Miami Ave.	SE/NE 1st Ave/17th St.	6,700	7,000	8,800	10%	1,060	8,060	9,860	2 (one-way) WB	22,000	B	B	B	B	B	4.8%	No	No
			SE/NE 1st Ave/17th St.	2nd Ave.	6,800	7,200	9,000	10%	1,060	8,260	10,060	2 (one-way) WB	22,000	B	B	B	B	B	4.8%	No	No
			2nd Ave.	US 1	3,200	3,400	4,200	10%	1,060	4,460	5,260	2 (one-way) WB	22,000	B	B	B	B	B	4.8%	No	No
	E/W	NE 3rd St	NW 3rd Ave	NW 2nd Ave.	9,200	9,700	12,100	5%	530	10,230	12,630	2	16,500	C	C	C	C	C	3.2%	No	No
			NW 2nd Ave. (1)	NW 1st Ave. (1)	6,800	7,100	8,900	10%	1,060	8,160	9,960	2	16,500	B	B	B	B	C	6.4%	Yes	No
			NW 1st Ave.	Miami Ave.	9,100	9,600	12,000	10%	1,060	10,660	13,060	2 (one-way) WB	22,000	B	B	B	B	B	4.8%	No	No
			Miami Ave.	SE/NE 1st Ave/17th St.	10,400	11,000	13,700	10%	1,060	12,060	14,760	2 (one-way) WB	22,000	B	B	B	B	B	4.8%	No	No
			SE/NE 1st Ave/17th St.	2nd Ave.	8,200	8,600	10,800	10%	1,060	9,660	11,860	2 (one-way) WB	22,000	B	B	B	B	B	4.8%	No	No
			2nd Ave.	US 1	2,000	2,100	2,600	10%	1,060	3,160	3,660	2 (one-way) WB	22,000	B	B	B	B	B	4.8%	No	No
	E/W	NE 5th St.	NW 3rd Ave.	NW 2nd Ave.	14,400	15,100	18,900	0%	0	15,100	18,900	3 (one-way) EB	27,500	B	B	B	B	B	0.0%	No	No
			NW 2nd Ave.	NW 1st Ave.	15,900	16,700	20,900	10%	1,060	17,760	21,960	3 (one-way) EB	27,500	B	B	B	B	D	3.9%	No	No
			NW 1st Ave.	Miami Ave.	19,400	20,400	25,500	10%	1,060	21,460	26,560	3 (one-way) EB	27,500	B	C	C	C	E	3.9%	No	No
			Miami Ave.	SE/NE 1st Ave/17th St.	10,500	11,000	13,800	10%	1,060	12,060	14,860	3 (one-way) EB	27,500	B	B	B	B	B	3.9%	No	No
			SE/NE 1st Ave/17th St.	2nd Ave.	9,100	9,600	12,000	10%	1,060	10,660	13,060	3 (one-way) EB	27,500	B	B	B	B	B	3.9%	No	No
			2nd Ave.	US 1	9,900	11,000	16,300	10%	1,060	12,060	17,360	3 (one-way) EB	27,500	B	B	B	B	B	3.9%	No	No
	E/W	NE 6th St.	NW 2nd Ave.	NW 1st Ave.	3,900	6,100	16,900	10%	1,060	7,160	17,960	2 (one-way) WB	22,000	B	B	B	B	C	4.8%	No	No
			NW 1st Ave.	Miami Ave.	17,600	18,600	23,200	10%	1,060	19,660	24,260	2 (one-way) WB	22,000	C	C	C	F	F	4.8%	No	No
			Miami Ave.	SE/NE 1st Ave/17th St.	17,300	18,200	22,700	10%	1,060	19,260	23,760	2 (one-way) WB	22,000	B	C	C	F	F	4.8%	No	No
			SE/NE 1st Ave/17th St.	2nd Ave.	13,500	14,600	19,800	10%	1,060	15,660	20,860	2 (one-way) WB	22,000	B	B	B	B	B	4.8%	No	No
			2nd Ave.	US 1	23,700	25,000	31,200	5%	530	25,530	31,730	3 (one-way) WB	27,500	C	C	C	F	F	1.9%	No	No
	E/W	NE 10th St.	NW 3rd Ave.	NW 2nd Ave.	4,900	5,900	10,700	0%	0	5,900	10,700	2 (one-way) EB	22,000	B	B	B	B	B	0.0%	No	No
			NW 2nd Ave.	NW 1st Ave.	2,000	3,700	12,000	0%	0	3,700	12,000	2 (one-way) EB	22,000	B	B	B	B	B	0.0%	No	No
			NW 1st Ave.	Miami Ave.	10,900	11,400	14,300	10%	1,060	12,460	15,360	2 (one-way) EB	22,000	B	B	B	B	B	4.8%	No	No
			Miami Ave.	SE/NE 1st Ave/17th St.	7,500	7,900	9,900	10%	1,060	8,960	10,960	2 (one-way) EB	22,000	B	B	B	B	B	4.8%	No	No
			SE/NE 1st Ave/17th St.	2nd Ave.	7,400	7,800	9,700	10%	1,060	8,860	10,760	2 (one-way) EB	22,000	B	B	B	B	B	4.8%	No	No
			2nd Ave.	US 1	12,200	12,900	16,100	5%	530	13,430	16,630	2 (one-way) EB	22,000	B	B	B	B	B	2.4%	No	No
	E/W	NE 11th St.	NW 2nd Ave.	NW 1st Ave.	1,900	3,400	10,800	10%	1,060	4,460	11,860	2 (one-way) WB	22,000	B	B	B	B	B	4.8%	No	No
			NW 1st Ave.	Miami Ave.	9,500	10,000	12,500	5%	530	10,530	13,030	2 (one-way) WB	22,000	B	B	B	B	B	2.4%	No	No
			Miami Ave.	SE/NE 1st Ave/17th St.	9,800	10,300	12,900	5%	530	10,830	13,430	2 (one-way) WB	22,000	B	B	B	B	B	2.4%	No	No
			SE/NE 1st Ave/17th St.	2nd Ave.	10,500	11,000	13,800	5%	530	11,530	14,330	2 (one-way) WB	22,000	B	B	B	B	B	2.4%	No	No
			2nd Ave.	US 1	9,100	9,600	12,000	5%	530	10,130	12,530	2 (one-way) WB	22,000	B	B	B	B	B	2.4%	No	No
	N/S	US 1	SE 1st St	Flagler St.	36,800	39,100	50,400	5%	530	39,630	50,930	8	64,700	D	D	D	D	D	0.8%	No	No
			Flagler St.	NW 1st St.	38,500	40,500	50,600	5%	530	41,030	51,130	8	64,700	D	D	D	D	D	0.8%	No	No
			NW 1st St.	NW 3rd St.	39,700	41,800	52,200	5%	530	42,330	52,730	8	64,700	D	D	D	D	D	0.8%	No	No
			NW 3rd St.	NE 5th St.	38,900	41,000	51,200	5%	530	41,530	51,730	8	64,700	D	D	D	D	D	0.8%	No	No
			NE 5th St.	NE 6th St.	43,500	45,800	57,200	5%	530	46,330	57,730	8	64,700	D	D	D	D	D	0.8%	No	No
			NE 6th St.	NE 10th St.	44,000	46,600	59,400	10%	1,060	47,660	60,460	8	64,700	D	D	D	E	E	1.6%	No	No
			NE 10th St.	NE 11th St.	41,200	43,400	54,200	5%	530	43,930	54,730	8	64,700	D	D	D	D	D	0.8%	No	No
	N/S	SE 2nd Ave.	NW 1st St.	NW 3rd St.	18,500	19,500	24,400	5%	530	20,030	24,930	3 (one-way) SB	27,500	D	D	D	D	D	1.9%	No	No
			NW 3rd St.	NE 5th St.	22,800	24,000	30,000	10%	1,060	25,060	31,060	3 (one-way) SB	27,500	D	D	D	F	F	3.9%	Yes	No
			NE 5th St.	NE 6th St.	26,300	27,700	34,600	0%	0	27,700	34,600	3 (one-way) SB	27,500	D	D	D	F	F	0.0%	Yes	No
			NE 6th St.	NE 10th St.	19,000	20,100	25,700	0%	0	20,100	25,700	3 (one-way) SB	27,500	D	D	D	D	D	0.0%	No	No
			NE 10th St.	NE 11th St.	24,500	25,800	32,200	0%	0	25,800	32,200	3 (one-way) SB	27,500	D	D	D	F	F	0.0%	Yes	No
	N/S	SE/NE 1st Ave/17St.	SE 2nd St	SE 1st St	12,400	13,000	16,300	5%	530	13,530	16,830	3 (one-way) NB	27,500	D	D	D	D	D	1.9%	No	No
			SE 1st St	Flagler St.	14,300	15,000	18,800	10%	1,060	16,060	19,860	3 (one-way) NB	27,500	D	D	D	D	D	3.9%	No	No
			Flagler St.	NW 1st St.	13,100	13,800	17,200	20%	2,119	15,919	19,319	3 (one-way) NB	27,500	D	D	D	D	D	7.7%	Yes	No
			NW 1st St.	NW 3rd St.	13,200	13,900	17,400	0%	0	13,900	17,400	3 (one-way) NB	27,500	D	D	D	D	D	0.0%	No	No
			NW 3rd St.	NE 5th St.	11,900	13,700	22,600	0%	0	13,700	22,600	3 (one-way) NB	27,500	D	D	D	D	D	0.0%	No	No
			NE 5th St.	NE 6th St.	17,800	18,700	23,400	0%	0	18,700	23,400	3 (one-way) NB	27,500	D	D	D	D	D	0.0%	No	No
			NE 6th St.	NE 10th St.	16,000	17,300	24,000	0%	0	17,300	24,000	3 (one-way) NB	27,500	D	D	D	D	D	0.0%	No	No

			NE 10th St.	NE 11th St.	18,400	19,400	24,200	0%	0	19,400	24,200	3 (one-way) NB	27,500	D	D	D	D	D	0.0%	No	No
	N/S	Miami Ave.	SE 2nd St	SE 1st St	12,800	13,400	16,800	5%	530	13,930	17,330	3 (one-way) SB	27,500	D	D	D	D	D	1.9%	No	No
			SE 1st St	Flagler St.	10,400	11,000	13,700	10%	1,060	12,060	14,760	3 (one-way) SB	27,500	D	D	D	D	D	3.9%	No	No
			Flagler St.	NW 1st St.	6,500	6,900	8,600	10%	1,060	7,960	9,660	3 (one-way) SB	27,500	C	C	C	C	C	3.9%	No	No
			NW 1st St.	NW 3rd St.	12,800	13,400	16,800	10%	1,060	14,460	17,860	3 (one-way) SB	27,500	D	D	D	D	D	3.9%	No	No
			NW 3rd St.	NE 5th St.	16,700	17,600	22,000	10%	1,060	18,660	23,060	3 (one-way) SB	27,500	D	D	D	D	D	3.9%	No	No
			NE 5th St.	NE 6th St.	4,400	5,400	10,300	10%	1,060	6,460	11,360	3 (one-way) SB	27,500	C	C	C	C	C	3.9%	No	No
			NE 6th St.	NE 10th St.	11,000	11,600	14,500	10%	1,060	12,660	15,560	3 (one-way) SB	27,500	C	C	C	C	C	3.9%	No	No
			NE 10th St.	NE 11th St.	7,700	8,100	10,100	0%	0	8,100	10,100	3 (one-way) SB	27,500	C	C	C	C	C	0.0%	No	No
	N/S	NW 1st Ave./Arena Blvd.	SE 2nd St	SE 1st St	800	800	1,000	0%	0	800	1,000	4	31,900	C	C	C	C	C	0.0%	No	No
			SE 1st St	Flagler St.	900	1,000	1,200	50%	5,298	6,298	6,498	4	31,900	C	C	C	C	C	16.6%	Yes	No
			Flagler St.	NW 1st St.	1,800	1,900	2,400	50%	5,298	7,198	7,698	4	31,900	C	C	C	C	C	16.6%	Yes	No
			NW 1st St.	NW 3rd St.	6,200	6,300	6,600	40%	4,238	10,538	10,838	4	31,900	C	C	C	C	C	13.3%	Yes	No
			NW 3rd St. at **Miami Station**	NE 5th St.	5,100	5,400	6,700	30%	3,179	8,579	9,879	4	31,900	C	C	C	C	C	10.0%	Yes	No
			NE 5th St.	NE 6th St.	9,000	9,400	11,800	30%	3,179	12,579	14,979	4	31,900	C	C	C	C	D	10.0%	Yes	No
			NE 6th St.	NE 10th St.	14,900	16,900	26,700	20%	2,119	19,019	28,819	4	31,900	C	C	C	D	E	6.6%	Yes	Yes
			NE 10th St.	NE 11th St.	9,600	10,100	12,600	10%	1,060	11,160	13,660	2	16,500	B	C	C	C	C	6.4%	Yes	No

Notes:

(1) The road segments shown in BLUE reflect changes in the project distribution from the Miami South At Grade Station

(2) Where traffic counts are not available, the 2011 and 2015 background traffic is derived by applying a 1% annual reduction of the 2035 AADT road segment volume

(3) Traffic Counts obtained from FDOT's 2011 Florida Transportation Information database and counts taken in 2011 for the FEC railroad traffic operational study.

(4) Future 2035 background ADT is obtained from the 2035 Cost Affordble Southeast Florida Regional Planning Model, SERPM Version 6.5.2e

(5) Project traffic was manually distributed based upon roadways considering future background traffic, land use , and road connectivity

(6) Significant impact is where the project consumes 5% of more of the road capacity

(7) Adverse impact is where the project consumes 5% or more of the road capacity and the road is anticipated to operate at LOS E or LOS F

(8) Capacity is based on FDOT's Generalized Annual Average Daily Service Volumes for urbanized areas where the number of lanes for 2015 is based upon the 2035 Cost Feasible Plan lanes obtained from the SERPM, Version 6.5.2.e model

Florida East Coast Railway
Development of Commuter Rail Service from Downtown West Palm Beach to Downtown Miami
Trip Generation for Proposed Stations

1. Introduction

Florida East Coast Railway (FEC) is proposing to develop commuter rail service from downtown West Palm Beach to downtown Miami. The service will include stations at West Palm Beach, Fort Lauderdale, and Miami. This report documents the trip generation estimates based on the proposed land uses and ridership estimates at each station.

2. Proposed Land Uses

Following land uses are being proposed at the stations:

West Palm Beach Station:

- 10,000 square foot retail within the station

Fort Lauderdale Station:

- 10,000 square foot retail within the station

Miami Station:

- 30,000 square foot retail within the station,
- 75,000 square foot retail
- 300,000 square foot office
- 200-room hotel
- 400-resdential units

3. Daily Boarding and Ridership

Daily boarding forecast for the year 2030 for the proposed stations are based on *All Aboard Florida (AAF) Ridership and Revenue Forecasts*. Year 2030 daily boarding volumes by station access mode are presented in **Table 1**.

TABLE 1
2030 DAILY BOARDINGS AT AAF STATIONS
STATION ACCESS MODE SPLT AND VOLUMES

AAF Station	Daily Boardings	Private Auto Park and Ride	Private Auto Drop-Off	Total Private Auto	Taxi	Transit/ Shuttle	Walk	Bike	Total
West Palm Beach		22%	13%	35%	2%	24%	37%	2%	**100%**
Fort Lauderdale		18%	9%	27%	2%	37%	32%	2%	**100%**
Miami		16%	6%	22%	4%	38%	34%	2%	**100%**
West Palm Beach	1,699	374	221	595	34	408	629	34	**1,700**
Fort Lauderdale	953	172	86	257	19	353	305	19	**953**
Miami	2,477	396	149	545	99	941	842	50	**2,477**
Total	**5,129**	**942**	**456**	**1,397**	**152**	**1,702**	**1,776**	**103**	**5,130**

1. Source: Daily Boardings from AAF Ridership and Revenue Forecast
2. Station Access Modal Split adapted from Transit Cooperative Research Report 153 - Guidelines for Providing Access to Public Transportation Stations, 2012.

4. Trip Generation

Trip generation estimates at each station consists of trips generated by the proposed land uses at each station and the trips associated with the forecasted boarding and ridership data. Trips for retail, office, and hotel land uses were estimated using the *Institute of Transportation Engineers (ITE) Trip Generation, 8th Edition.* Trip reductions associated with internal trip capture (for mixed use development at Miami Station) and pass-by trip reduction for retail uses were applied according to ITE guidelines. The internal capture rate was limited to a maximum of 20 % of gross trips.

Trips associated with boardnigs were estimated assuming one trip per boarding for private auto, and taxi modes, and transit/shuttle boardings were converted to trips assuming approximately 1 trip per 15 boardings. Also, daily boardings were doubled to account for return trips. For the peak hour, it was assumed that 30% of the daily boardings would occur during the peak hour. This information was based Transportation Research Board's (TRB) Commuter & Light Rail Transit Corridors, March 1996.

Total daily and peak hour trip estimates for each station were estimated by combining the trips generated from the land use development and the trips associated with boardings. The trip generation summary is presented in **Table 2**. The trip generation worksheets and relevant information is provided in the **Appendix.**

TABLE 2
TRIP GENERATION SUMMARY FOR PROPOSED STATIONS (NET NEW TRIPS)

Description	Daily			AM Peak Hour			PM Peak Hour		
	In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
WEST PALM BEACH STATION									
Retail Trips	182	182	364	24	16	40	16	17	33
Ridership/Boarding Trips	656	656	1,312	197	197	394	197	197	394
TOTAL	**838**	**838**	**1,676**	**221**	**213**	**434**	**213**	**214**	**427**
FORT LAUDERDALE STATION									
Retail Trips	182	182	364	24	16	40	16	17	33
Ridership/Boarding Trips	300	300	600	90	90	180	90	90	180
TOTAL	**482**	**482**	**964**	**114**	**106**	**220**	**106**	**107**	**213**
MIAMI STATION									
Office/Retail/Hotel/ Residential Trips	4,591	4,591	9,182	612	263	875	364	557	921
Ridership/Boarding Trips	707	707	1,414	212	212	424	212	212	424
TOTAL	**5,298**	**5,298**	**10,596**	**824**	**475**	**1,299**	**576**	**769**	**1,345**

1. See the attached trip generation sheets for detailed trip generation, internal capture, and pass-by calculations.
2. Daily Boardings information is obtained from AAF Ridership and Revenue Forecast
3. Station Access Modal Split adapted from Transit Cooperative Research Report 153 - Guidelines for Providing Access to Public Transportation Stations, 2012.
4. Peak hour boardings are assumed to be 30% of the daily boardings based on the information from TRB's Commuter & Light Rail Transit Corridors, March 1996.

APPENDIX

TRIP GENERATION

Florida East Coast Railway
Development of Passenger Rail Service from Downtown West Plam Beach to Downtown Miami
Trip Generation Estimates for Proposed Stations

						Gross Trips					Internal Capture				Pass-by Trips				Net External Trips		
Time Period	**Land Use**	**ITE-LUC**	**Intensity**	**Unit**	**ITE Equation/Rate**	**In %**	**Out %**	**In**	**Out**	**Total**	**%**	**In**	**Out**	**Total**	**%**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
West Palm Beach Station_10,000 SFT Retail																					
Daily	Retail	820	10000	SFT	Ln(T)=0.65Ln(X)+5.83	50%	50%	760	760	1520	0.0%	0	0	0	76.0%	578	578	1156	182	182	364
AM Peak	Retail	820	10000	SFT	Ln(T)=0.59Ln(X)+2.32	61%	39%	24	16	40	0.0%	0	0	0	0.0%	0	0	0	24	16	40
PM Peak	Retail	820	10000	SFT	Ln(T)=0.67Ln(X)+3.37	49%	51%	67	69	136	0.0%	0	0	0	76.0%	51	52	103	16	17	33
Fort Lauderdale Station_10,000 SFT Retail																					
Daily	Retail	820	10000	SFT	Ln(T)=0.65Ln(X)+5.83	50%	50%	760	760	1520	0.0%	0	0	0	76.0%	578	578	1156	182	182	364
AM Peak	Retail	820	10000	SFT	Ln(T)=0.59Ln(X)+2.32	61%	39%	24	16	40	0.0%	0	0	0	0.0%	0	0	0	24	16	40
PM Peak	Retail	820	10000	SFT	Ln(T)=0.67Ln(X)+3.37	49%	51%	67	69	136	0.0%	0	0	0	76.0%	51	52	103	16	17	33
Miami Station_75,000 SFT Retail																					
Daily	Retail	820	75000	SFT	Ln(T)=0.65Ln(X)+5.83	50%	50%	2817	2817	5633	20.0%	563	563	1126	39.0%	879	879	1758	1375	1375	2750
AM Peak	Retail	820	75000	SFT	Ln(T)=0.59Ln(X)+2.32	61%	39%	79	51	130	0.0%	0	0	0	0.0%	0	0	0	79	51	130
PM Peak	Retail	820	75000	SFT	Ln(T)=0.67Ln(X)+3.37	49%	51%	257	268	525	20.0%	51	54	105	39.0%	80	83	163	126	131	257
Miami Station_30,000 SFT Retail																					
Daily	Retail	820	30000	SFT	Ln(T)=0.65Ln(X)+5.83	50%	50%	1553	1553	3105	20.0%	311	311	622	55.0%	683	683	1366	559	559	1118
AM Peak	Retail	820	30000	SFT	Ln(T)=0.59Ln(X)+2.32	61%	39%	46	30	76	0.0%	0	0	0	0.0%	0	0	0	46	30	76
PM Peak	Retail	820	30000	SFT	Ln(T)=0.67Ln(X)+3.37	49%	51%	139	145	284	20.0%	28	29	57	55.0%	61	64	125	50	52	102
Miami Station_300,000 SFT Office																					
Daily	Retail	710	300000	SFT	Ln(T)=0.77Ln(X)+3.65	50%	50%	1555	1555	3109	20.0%	311	311	622	0.0%	0	0	0	1244	1244	2488
AM Peak	Retail	710	300000	SFT	Ln(T)=0.80Ln(X)+1.55	88%	12%	398	54	452	0.0%	0	0	0	0.0%	0	0	0	398	54	452
PM Peak	Retail	710	300000	SFT	T=1.12(X)+78.81	17%	83%	71	344	415	20.0%	14	69	83	0.0%	0	0	0	57	275	332
Miami Station_200 Room Hotel																					
Daily	Retail	310	200	Rooms	T=8.95(X)-373.16	50%	50%	709	709	1417	0.0%	0	0	0	0.0%	0	0	0	709	709	1418
AM Peak	Retail	310	200	Rooms	Ln(T)=1.24Ln(X)-2.00	61%	39%	59	38	97	0.0%	0	0	0	0.0%	0	0	0	59	38	97
PM Peak	Retail	310	200	Rooms	0.59	53%	47%	63	55	118	0.0%	0	0	0	0.0%	0	0	0	63	55	118
Miami Station_400 Residential Units																					
Daily	Residential	222	400	Dwelling Units	Ln(T)=0.83Ln(X)+2.50	50%	50%	880	880	1760	20.0%	176	176	352	0.0%	0	0	0	704	704	1408
AM Peak	Residential	222	400	Dwelling Units	Ln(T)=0.99Ln(X)-1.14	25%	75%	30	90	120	0.0%	0	0	0	0.0%	0	0	0	30	90	120
PM Peak	Residential	222	400	Dwelling Units	T=0.32(X)+12.30	61%	39%	85	55	140	20.0%	17	11	28	0.0%	0	0	0	68	44	112
Miami Station Total																					
Daily								7514	7514	15028		1361	1361	2722		1562	1562	3124	4591	4591	9182
AM Peak								612	263	875		0	0	0		0	0	0	612	263	875
PM Peak								615	867	1482		110	163	273		141	147	288	364	557	921

Notes: ITE-Institute of Transportation Engineers
LUC-Land use code
SFT-Square Feet
Internal capture rate was limited to a maximum 20% of gross trips

Pass-by Capture for Retail Uses

West Palm Beach Station

Intensity	Unit	Equation	Pass-by %
10000	SFT	Ln(T)=-0.29Ln(X)+5.00	76

Fort Lauderdale Station

Intensity	Unit	Equation	Pass-by %
10000	SFT	Ln(T)=-0.29Ln(X)+5.00	76

Miami Station

Intensity	Unit	Equation	Pass-by %
100000	SFT	Ln(T)=-0.29Ln(X)+5.00	39

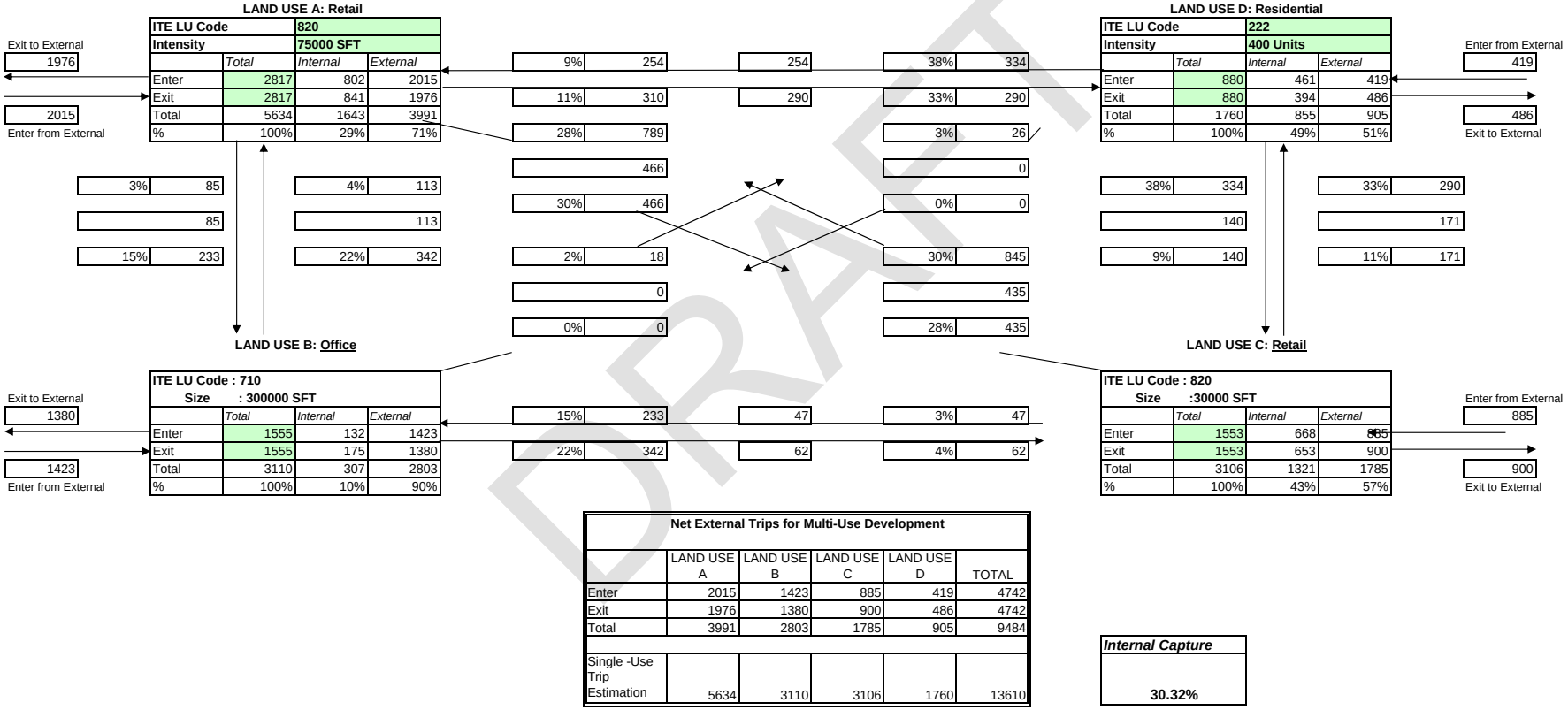
Miami Station

Intensity	Unit	Equation	Pass-by %
30000	SFT	Ln(T)=-0.29Ln(X)+5.00	55

MULTI-USE DEVELOPMENT
TRIP GENERATION AND INTERNAL CAPTURE SUMMARY

Florida East Coast Railway

Analyst:URS **Date: 7/24/2012** **Time period: Daily**



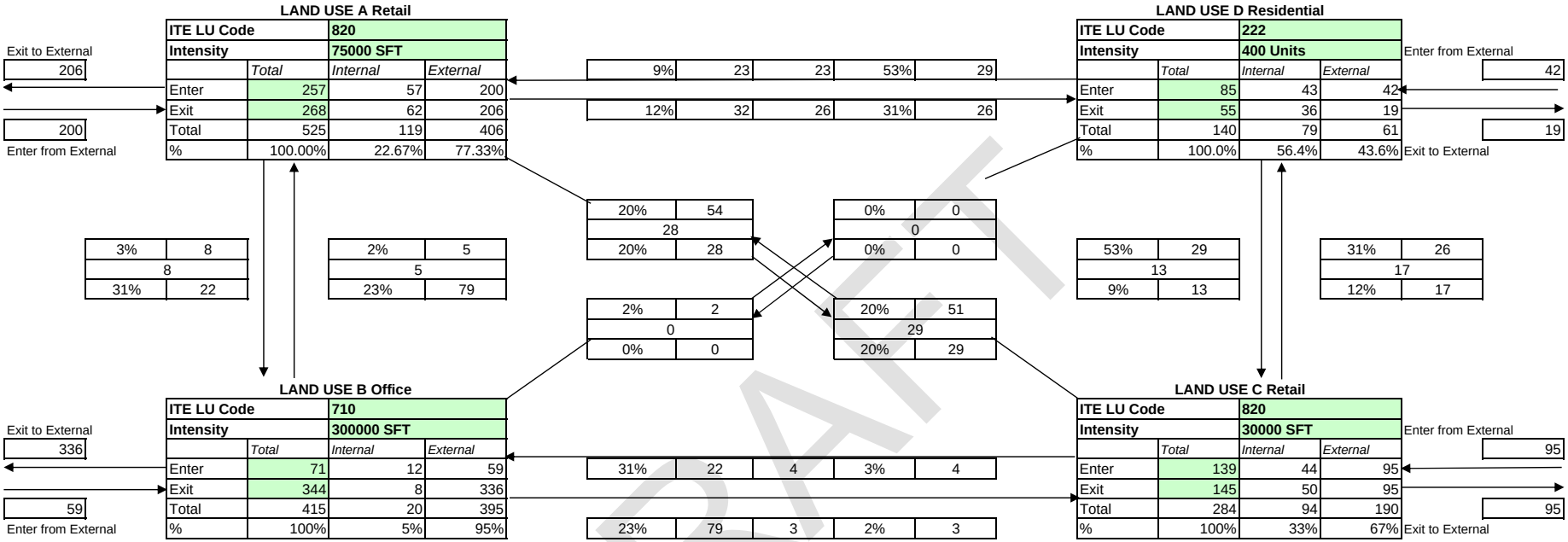
Net External Trips for Multi-Use Development					
	LAND USE A	LAND USE B	LAND USE C	LAND USE D	TOTAL
Enter	2015	1423	885	419	4742
Exit	1976	1380	900	486	4742
Total	3991	2803	1785	905	9484
Single -Use Trip Estimation	5634	3110	3106	1760	13610

Internal Capture
30.32%

MULTI-USE DEVELOPMENT
TRIP GENERATION AND INTERNAL CAPTURE SUMMARY

Florida East Coast Railway

Analyst:URS **Date: 7/24/2012** **Time period: PM Peak**



Net External Trips for Multi-Use Development

	LAND USE A	LAND USE B	LAND USE C	LAND USE D	TOTAL
Enter	200	59	95	42	396
Exit	206	336	95	19	656
Total	406	395	190	61	1052
Single -Use Trip Estimation	525	415	284	140	1364

Internal Capture
22.87%