Appendix 3.3.5-C

Transportation and Railroad Crossing Analysis

Transportation and Railroad Crossing Analysis for the All Aboard Florida Passenger Rail Project from Cocoa to West Palm Beach, Florida

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List of Acronyms and Abbreviations

AAF	All Aboard Florida – Operations LLC
AADT	Annual Average Daily Traffic
DEIS	Draft Environmental Impact Statement for AAF Passenger Rail Project Orlando to Miami, Florida
EA	Environmental Assessment
FEC	Florida East Coast
FECI	Florida East Coast Industries, Inc.
FRA	Federal Railroad Administration
FDOT	Florida Department of Transportation
FEC ROW	Florida East Coast Right-of-Way and North-South Corridor
FONSI	Finding of No Significant Impact
FRA	Federal Rail Authority
GIS	Geographic Information System
GPS	Global Positioning System
ITE	Institute of Transportation Engineers
LOS	Level of Service
ROW	Right-of-way
USDOT	United States Department of Transportation

1.0 Introduction

Pursuant to the National Environmental Policy Act (NEPA) of 1969 [42 United States Code (USC) 4321 et seq], and Council on Environmental Quality (CEQ) NEPA regulations [40 Code of Federal Regulation (CFR) 1500-1508], the Federal Railroad Administration (FRA) has initiated an evaluation of the potential environmental and related impacts of constructing and operating an intercity passenger rail service as proposed by All Aboard Florida – Operations LLC (AAF). Specifically, AAF is proposing to construct and operate a privately-owned, intercity passenger railroad system that will connect Orlando and Miami, with intermediate stops in Fort Lauderdale and West Palm Beach, Florida (Project). As AAF intends to apply for a loan under FRA's Railroad Rehabilitation and Improvement Financing (RRIF) Program pursuant to 49 CFR Part 260, FRA must consider the potential environmental impacts resulting from the Project pursuant to NEPA.

AAF previously completed an Environmental Assessment and Section 4(f) Evaluation (AAF EA)[1] for intercity passenger rail service between Miami and West Palm Beach, Florida. FRA issued a Finding of No Significant Impact (AAF FONSI)[2] for the AAF EA in January 2013. To the extent that actions have not changed since the AAF EA, these would not be evaluated by FRA as part of this proposed action (Proposed Action), which will consist of a 235-mile intercity passenger rail service composed of the following two connected corridors and a new vehicle maintenance facility (VMF):

- An extension of the north-south corridor that includes approximately 128.5 miles of rail improvements between West Palm Beach and Cocoa, Florida, within an existing, active freight rail right-of-way (ROW), as well as modifications to seven existing bridges along the 66.5-mile portion of that ROW that was evaluated as part of the AAF EA and AAF FONSI (North-South Corridor); and
- An east-west corridor of approximately 40 miles from Cocoa to Orlando, Florida, generally parallel to the existing State Road 528 (SR 528 or Beachline Expressway), which would extend the service analyzed in the AAF EA and AAF FONSI to the Orlando International Airport (MCO), where the new VMF would be constructed (East-West Corridor).

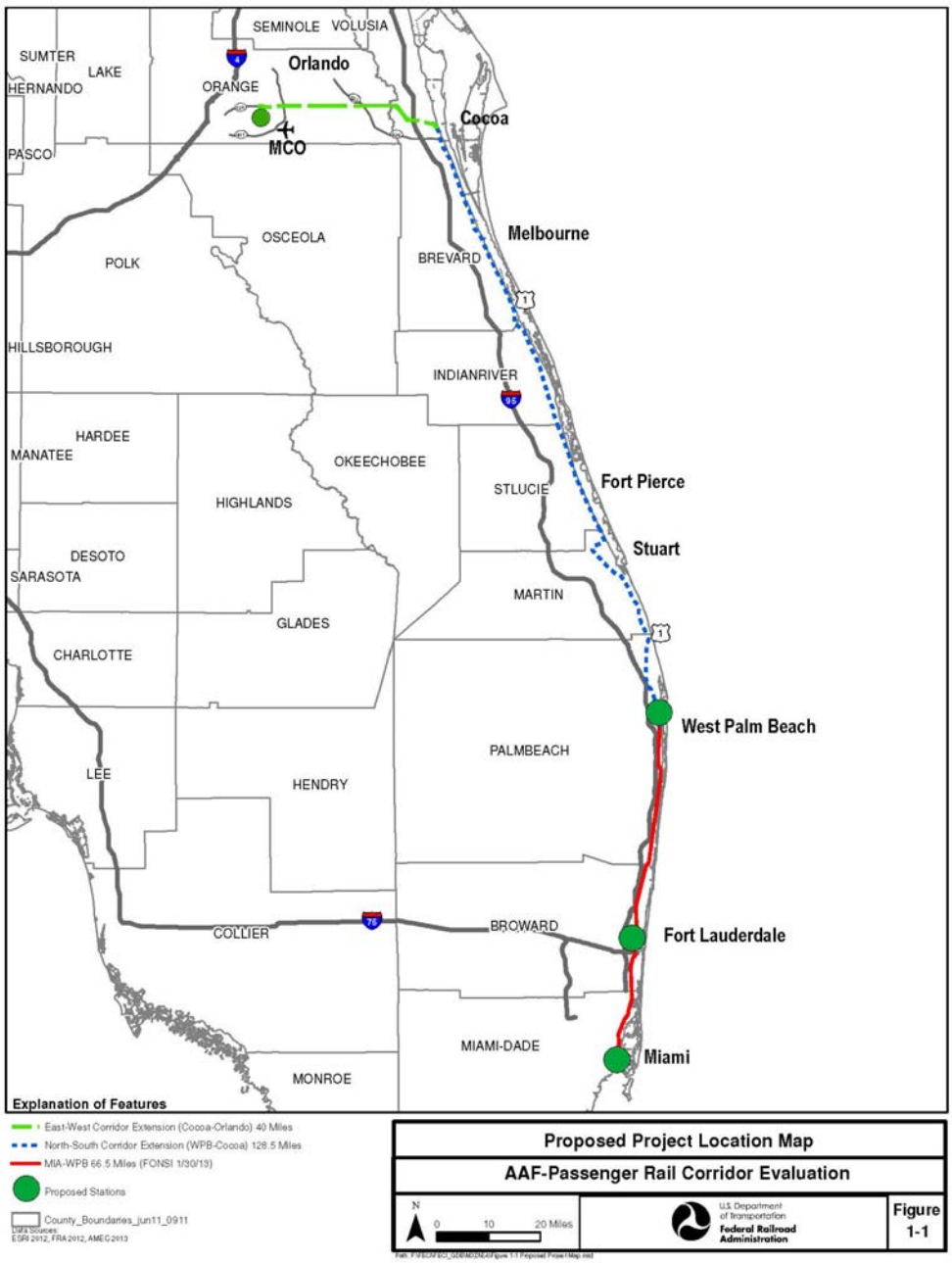
A proposed station at MCO (Orlando Station) is expected to be developed by the Greater Orlando Airport Authority (GOAA) and would serve as the Orlando terminus for the Proposed Action. Development of this Orlando Station has been studied by GOAA in two previous environmental assessments (each, an EA).[3] [4]

As described in more detail in the notice of intent to prepare an environmental impact statement (EIS) for the Project that was published by FRA in the Federal Register on April 15, 2013, FRA shall act as the lead Federal agency in conducting the environmental review and preparing, reviewing, revising and completing the environmental documentation related to the Proposed Action. The EIS shall be prepared to satisfy the requirements of NEPA. . An overview map of the proposed Project is shown in Figure 1-1, Project Location.

[1] All Aboard Florida – Operations LLC. 2012. Environmental Assessment and Section 4(f) Evaluation for the All Aboard Florida Passenger Rail Project West Palm Beach to Miami, Florida. Available at: http://www.fra.dot.gov/eLib/details/L04278.
[2] United States Department of Transportation (USDOT), Federal Railroad Administration (FRA). 2013. Finding of No Significant Impact for the All Aboard Passenger Rail Project West Palm Beach to Miami, Florida. Available at: http://www.fra.dot.gov/Elib/Details/L04277.
[3] United States Department of Transportation (USDOT), Federal Aviation Administration (FAA) and Greater Orlando Aviation Authority (GOAA). 1998. Environmental Assessment for the Proposed South Terminal Complex at the Orlando International Airport.
[4] United States Department of Transportation (USDOT), Federal Transit Administration (FTA), Florida Department of Transportation (FDOT) and Greater Orlando Aviation Authority (GOAA). 2005. Environmental Assessment for the Proposed OIA Intermodal Center and associated High Speed Rail and Light Rail Alignments.

This Technical Memorandum describes the existing traffic and rail conditions in the Project Area and documents traffic operations analysis for selected railroad crossings at major arterials in the North-South Corridor study area. This analysis was done to evaluate the impact of the Proposed Action on the adjacent roadway network.

Figure 1-1. AAF System; proposed Project including the East-West Corridor and the North-South Corridor



2.0 Affected Environment

2.1 Transportation

The potential for impacts to transportation services including rail, regional roadway and local roadway networks resulting from the Proposed Action has been evaluated. As discussed in the Purpose and Need Statement, FDOT's 2006 *Vision Plan* projects a 200 percent increase in intercity travel within Florida by 2040. The Proposed Action will provide additional infrastructure to help meet this demand.

In order to reduce or eliminate the potential impacts associated with a new transportation project, the proposed Project has been primarily located within the FEC Corridor and adjacent to existing roads. The Project is intended to alleviate the growing congestion of the regional highway system while not creating new or substantial delays to existing local transportation networks.

The analysis performed on transportation focuses on impacts in the ***North-South Corridor Alternative***, which is comparatively less densely populated and allows for greater train speeds at existing roadway crossings due to fewer stops than the service evaluated from West Palm Beach to Miami in the AAF EA for which the AAF FONSI was issued. The ***East-West Corridor Alternatives*** will be constructed without the need for road crossings, which will alleviate regional highway congestion while creating no adverse local traffic impacts.

2.1.1 Existing Rail and Bus Systems

2.1.1.1 Existing Passenger Train/Bus Service

The National Railroad Passenger Corporation (Amtrak) provides passenger rail service between Orlando and West Palm Beach. This route runs twice daily from Orlando to West Palm Beach. From West Palm Beach it passes through Okeechobee, Sebring, Winter Haven and Kissimmee before arriving in Orlando. It takes about 5 hours one way and the average round trip cost for the service is $100.00 for one adult passenger.

Miami Orlando Shuttle Bus provides five bus trips daily, seven days a week between Orlando and West Palm Beach. From West Palm Beach the route follows along the Florida Turnpike passing through Fort Pierce, Kissimmee before arriving in Orlando. It takes about 4 hours and the average round trip cost for the service is $60.00 for one adult passenger.

Greyhound provides passenger bus service between Orlando and West Palm Beach. The route runs four times daily from Orlando to West Palm Beach. From West Palm Beach the route follows along the Florida Turnpike passing through Fort Pierce, Kissimmee before arriving in Orlando. It takes about 4 hours one way and the average round trip cost for the service is $60.00 for one adult passenger.

RedCoach provides passenger bus service between Orlando and West Palm Beach. The route north to south (Orlando to West Palm Beach) runs along the Florida Turnpike passing through Fort Pierce before arriving in Orlando. The route runs four times daily on Tuesday, Wednesday, Thursday, and Saturday. This route also runs two times daily on Monday, Friday, and Sunday. The route south to north (West Palm Beach to Orlando) runs along the Florida Turnpike passing through Fort Pierce before arriving in West Palm Beach. The route runs four times daily on Monday, Tuesday, Wednesday, and Saturday. This route also runs two times daily on Thursday, Friday, and Sunday. It takes about 3 hours one way and the average round trip cost for the service is $100.00 for one adult passenger.

2.1.1.2 Existing Freight Rail Service

Regular freight traffic currently operates within the FEC Corridor from Jacksonville to Miami. The freight track within the aforementioned FEC corridor was evaluated from MP 170 Cocoa (Brevard County) to MP 299 West Palm Beach (Palm Beach County). According to the FEC operations data from 2012, there are 4 flat switching yards, 18 stations, 72 industry turnouts and 21 bridge crossings along the aforementioned route.

The existing freight traffic consists of 18 trains per day, which includes both north-bound and south-bound trains. The average train length is 8,150 feet, which includes 2 locomotives and 101 cars. A summary of existing freight operations is provided in Table 2-1, with characteristics organized by County.

Table 2-1. Summary of Existing Freight Operating Characteristics and Average Crossing Closures

County	Time to Activate and Close the Gate (sec)	Avg. Train Length (ft)	Avg. Train Speed (mph)	Time to Clear (sec)	Time to Bring the Gate Back Up (sec)	Total Time to Activate and Clear (sec)	Crossings (Trains per Day)	Closure (min/ day)	Maximum Crossings per Hour	Maximum Delay per Hour (min)
2011 Freight										
Palm Beach	30	8150	59.4	94	15	139	18	41.6	1	2.3
Martin	30	8150	28.5	195	15	240	18	72.0	1	4.0
St Lucie	30	8150	28.5	195	15	240	18	72.0	1	4.0
Indian River	30	8150	28.5	195	15	240	18	72.0	1	4.0
Brevard	30	8150	28.5	195	15	240	18	72.0	1	4.0

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 account for the worst-case scenario, FDOT timings were used in this analysis.
2. Maximum crossings per hour includes north-bound and south-bound trains combined
3. 2011 freight speed for Palm Beach, Martin, St.Lucie, Indian River, and Brevard Counties was was obtained from Section 3.3.1.1 of the Environmental Assessment for the All Aboard Florida Passenger Rail Project – West Palm Beach to Miami, Florida, dated October 31, 2012.
4. Maximum Delay per Hour calculated as the Total Time to Activate and Clear multiplied by the Maximum Crossings per Hour.

2.1.2 Existing Roadway Network

The primary regional roadways that serve automobile traffic between West Palm Beach and Orlando are Florida's Turnpike, I-95, and SR 528. SR 528 is a partial toll road that is operated and maintained by Orlando-Orange County Expressway Authority (OOCEA) from Orlando to SR 520 and the Florida Department of Transportation (FDOT) from SR 520 to US 1. The OOCEA section has two toll plazas located along the route. The FDOT section is not a toll road. The Florida Turnpike is a toll road that is operated and maintained by the Florida Turnpike Enterprise (FTE) from Orlando to West Palm Beach. The FTE section has six toll plazas along the route. I-95 is an interstate system that is operated and maintained by FDOT from SR 528 intersection in Cocoa to West Palm Beach.
The level of service (LOS) and Average Annual Daily Traffic (AADT) for the aforementioned roadways were determined from the FDOT District 4 and 5 Generalized Tables and the FTE (Table 2-2). Overall the LOS through the analyzed roadway corridors is reasonably stable flow, at or near free flow traffic, LOS C, which is the target for highway systems outside urbanized areas according to FDOT.

Table 2-2. Summary of Existing Average Annual Daily Traffic (AADT) and Level of Service (LOS) for Primary Regional Roadways (page 1 of 3)

County	From	To	Length (miles)	Facility Type	Lanes	AADT	LOS
SR 528[1]							
Orange	I-4	SR 436	2.33	Tolled Expressway	6	78300	C
	SR 436	SR 15	2.70	Tolled Expressway	6	63400	B
	SR 15	SR 417	2.10	Tolled Expressway	4	40500	B
	SR 417	International Corp Park Blvd	4.22	Tolled Expressway	4	34000	B
	International Corp Park Blvd	Dallas Blvd	4.01	Tolled Expressway	4	38800	C
	Dallas Blvd	SR 520	7.05	Tolled Expressway	4	38800	C
	SR 520	Brevard County Line	4.96	Expressway	4	30000	B
Brevard	Orange County Line	SR 407	1.15	Expressway	4	30000	B
	SR 407	Urban Boundary	3.69	Expressway	4	26500	B
	Urban Boundary	I-95	1.08	Expressway	4	26500	B
	I-95	SR 524	4.03	Expressway	4	20200	B
I-95[1,2]							
Brevard	Indian River County	Urban Boundary	11.07	Freeway	4	34300	B
	Urban Boundary	SR 514/Malabar Rd	2.22	Freeway	6	34300	B
	SR 514/Malabar Rd	CR 516	3.01	Freeway	6	34000	B
	CR 516	US 192/SR 500	4.40	Freeway	4	55000	C
	US 192/SR 500	SR 520	20.82	Freeway	4	48300	C
	SR 520	SR 528	3.93	Freeway	6	54800	B
	SR 528	SR 46	18.29	Freeway	4	42600	B
	SR 46	CR 5A	7.57	Freeway	4	26500	B
	CR 5A	Volusia County Line	1.40	Freeway	4	30500	B
Indian River	St. Lucie County Line	SR 60	6.15	Freeway	4	38000	B
	SR 60	Fellsmere Rd	9.11	Freeway	4	41000	B
	Fellsmere Rd	Brevard County Line	3.90	Freeway	4	41000	B
St Lucie	Martin County Line	Gatlin Blvd	4.35	Freeway	6	51515	B
	Gatlin Blvd	St Lucie Blvd	3.45	Freeway	6	58000	B
	St Lucie Blvd	Midway Rd	4.39	Freeway	6	55000	B
	Midway Rd	SR 70/Okeechobee rd	3.25	Freeway	6	67000	C
	SR 70/Okeechobee Rd	SR 68/Orange Ave	2.24	Freeway	4	46278	C
	SR 68/Orange Ave	SR 614/Indrio Rd	6.45	Freeway	4	35000	B
	SR 614/Indrio Rd	Indian River County Line	3.08	Freeway	4	38000	B

[1] Florida Department of Transportation (FDOT), 2011. 2011 SHS LOS Maps. Received via secure download from Chon Wong, District 4. Received May, 2013.
[2] Florida Department of Transportation (FDOT), 2011. Florida's Turnpike AADT and LOS Request. May Request 05 07 2013 Spreadsheet for FY 2011. Received via email from Kim Cromartie Samson, Florida's Turnpike Enterprise. Received May, 2013.

Table 2-2. Summary of Existing Average Annual Daily Traffic (AADT) and Level of Service (LOS) for Primary Regional Roadways (page 2 of 3)

County	From	To	Length (miles)	Facility Type	Lanes	AADT	LOS
Martin	Palm Beach County Line	Bridge Rd	7.45	Freeway	6	66000	C
	Bridge Rd	SR 76/Kanner Hwy	4.77	Freeway	6	66500	C
	SR 76/Kanner Hwy	FLA TP/High Meadows Ave	1.63	Freeway	6	55500	B
	FLA TP/High Meadows Ave	Martin Highway	7.77	Freeway	6	39000	B
	Martin Highway	St Lucie County Line	3.13	Freeway	6	51515	B
Palm Beach	SR 882/Forest Hill Blvd	SR 80/Southern Blvd	1.45	Freeway	10	198500	D
	SR 80/Southern Blvd	Belvedere Rd	1.03	Freeway	10	137000	C
	Belvedere Rd	SR 704/Okeechobee Blvd	1.19	Freeway	10	169000	C
	SR 704/Okeechobee Blvd	Palm Beach Lakes Blvd	1.26	Freeway	10	166198	C
	Palm Beach Lakes Blvd	45th St	2.78	Freeway	10	179500	D
	45th St	SR 708/Blue Heron Rd	1.75	Freeway	10	153500	C
	SR 708/Blue Heron Rd	Northlake Blvd	1.75	Freeway	10	153500	C
	Northlake Blvd	SR 786/PGA Blvd	2.20	Freeway	10	145000	C
	SR 786/PGA Blvd	Donald Ross Rd	3.40	Freeway	10	82000	B
	Donald Ross Rd	SR 706/Indiantown Rd	3.81	Freeway	10	82000	B
	SR 706/Indiantown Rd	Martin County Line	1.87	Freeway	6	66000	C
Florida's Turnpike[3]							
Palm Beach	West Palm Beach (Okeechobee Blvd)	SR 710	6.60	Tolled Expressway	4	56300	C
	SR 710	Palm Beach Gardens (PGA Boulevard)	2.50	Tolled Expressway	4	51000	C
	Palm Beach Gardens (PGA Boulevard)	Jupiter (Indiantown Road)	6.86	Tolled Expressway	4	39900	B
	Jupiter (Indiantown Road)	Martin County Line	1.85	Tolled Expressway	4	35700	B
Martin	Martin County Line	Stuart (Martin Downs Boulevard/SR 714)	16.45	Tolled Expressway	4	35700	B
	Stuart (Martin Downs Boulevard/SR 714)	St Lucie County Line	3.84	Tolled Expressway	4	40700	B
St Lucie	St Lucie County Line	Becker Road	0.28	Tolled Expressway	4	40700	B
	Becker Road	Port St. Lucie (Port St. Lucie Boulevard)	4.56	Tolled Expressway	4	38100	B
	Port St. Lucie (Port St. Lucie Boulevard)	Fort Pierce (SR 70)	8.89	Tolled Expressway	4	32100	B
	Fort Pierce (SR 70)	Indian River County Line	21.30	Tolled Expressway	4	26400	B
Indian River	Indian River County Line	Okeechobee County Line	7.90	Tolled Expressway	4	26400	B

Source: FDOT and Florida's Turnpike Enterprise

Table 2-2. Summary of Existing Average Annual Daily Traffic (AADT) and Level of Service (LOS) for Primary Regional Roadways (page 3 of 3)

County	From	To	Length (miles)	Facility Type	Lanes	AADT	LOS
Okeechobee	Okeechobee County Line	Indian River County Line	7.17	Tolled Expressway	4	26400	B
Indian River	Indian River County Line	Osceola County Line	7.90	Tolled Expressway	4	26400	B
Osceola	Osceola County Line	Yeehaw Junction (SR 60)	2.61	Tolled Expressway	4	26400	B
	Yeehaw Junction (SR 60)	End Section	15.43	Tolled Expressway	4	25300	B
	Begin Section	Kissimmee Park Road	16.45	Tolled Expressway	4	25300	B
	Kissimmee Park Road	Kissimmee-St. Cloud South (US 192 & US 441)	3.14	Tolled Expressway	4	32700	B
	Kissimmee-St. Cloud South (US 192 & US 441)	Kissimmee-St. Cloud North (US 192 & US 441)	2.03	Tolled Expressway	4	31500	B
	Kissimmee-St. Cloud North (US 192 & US 441)	Osceola Parkway	4.18	Tolled Expressway	4	47800	C
	Osceola Parkway	End Section	0.51	Tolled Expressway	4	55900	C
Orange	Begin Section	SR 417/Central Florida GreeneWay	16.45	Tolled Expressway	4	55900	C
	SR 417/Central Florida GreeneWay	Orlando South (US 17/92/441)	4.26	Tolled Expressway	4	55900	C
	Orlando South (US 17/92/441)	Consulate Drive	0.37	Tolled Expressway	8	66900	B
	Consulate Drive	Orlando (I-4)	3.98	Tolled Expressway	8	70900	B

Source: FDOT and Florida's Turnpike Enterprise.

There are a couple of segments within the roadway corridors where the LOS approaches an unstable flow in traffic, LOS D, but according to FDOT LOS D is the target for highway systems inside urbanized areas. Therefore the aforementioned roadways meet or exceed the LOS standard for state highway systems according to FDOT.

2.1.2.1 Existing Highway Rail Grade Crossings

The Proposed Action along the North-South Corridor Alternative currently crosses 167 roadways over 5 Counties from the West Palm Beach to Cocoa. A summary of the total number of crossings by county is provided in Table 2-3. The crossings include both public and private roads, and are classified as highway-rail grade crossings.

Table 2-3. Summary of Total Crossings by County

County	Length of Corridor (miles)	Number of Crossings
Brevard	42	55
Indian River	21	30
St Lucie	22	20
Martin	26	25
Palm Beach	18	26

Source: FEC Grade Crossing Inventory[5]

2.1.2.2 Existing Roadway Network for MCO and the VMF

Florida's Strategic Intermodal System Plan (SIS) has identified MCO as a hub in the system of hubs, connectors, and corridors. MCO provides a location for the integration of various forms of transportation (air, bus, and personal vehicles). MCO currently handles 295,000 annual flight arrivals and departures with approximately 809 daily flight arrivals and departures.[6]

MCO is located south of SR 528 and north of SR 417 (Central Florida Greenway). Roadway access from the north is primarily from Jeff Fuqua Boulevard and from the south via the South Access Road.

The local public transportation service (LYNX) provides daily fixed-route local bus service between MCO and nearby destinations in Orlando.[7] LYNX's area of service includes Orange, Seminole and Osceola counties. LYNX provides more than 85,000 passenger trips each weekday spanning an area of approximately 2,500 square miles with a resident population of more than 1.8 million.

An Amtrak station is located approximately 12 miles from MCO, and can be accessed via buses, taxies, and vehicles for hire. Taxi cabs, shuttle vans, and rental cars are additional transportation options for MCO. Also, cruise transfers for ships leaving Port Canaveral occur at MCO.

The VMF is located adjacent to and north of Boggy Creek Road within MCO property (Figure 4-3, Technical Memorandum No. 3 *Alternatives Identification for the All Aboard Florida Passenger Rail Project from Orlando to Miami, Florida)*.[8] Employee traffic would access the station from Boggy Creek Road from the south. Traffic count information for the roadway is provided in Table 2-4.

[5] All Aboard Florida, 2013. FEC Grade Crossing Estimate Spreadsheet. Received via email from Alex Gonzolaz on March 7, 2013.
[6] MCO website accessed August 8, 2013. http://www.orlandoairports.net/statistics/index.htm
[7] LYNX website accessed August 7, 2013. http://www.golynx.com/about-lynx/
[8] AMEC Environment & Infrastructure, Inc. (AMEC). 2013. Technical Memorandum No. 3 *Alternatives Identification for the All Aboard Florida Passenger Rail Project from Orlando to Miami, Florida*

Table 2-4. Traffic Count Information for the ***VMF Alternative*** Location Service Roads

VMF Alternative	Access Road	Segment	AADT	LOS[9]
GOAA	CR530/Boggy Creek Rd	N of Airport Park Dr	13000	E
GOAA	CR530/Boggy Creek Rd	Weatherbee to E. Weatherbee	9300	E

MCO currently has approximately 17,000 parking spaces in garage structures adjacent to the main terminal as well as satellite surface lots.[10] Two overflow parking lots with over 3,000 parking spaces have been closed. According to MCO officials, even on the busiest day at the airport, no more than 79 percent of the MCO parking spaces have ever been filled.[11] North of the MCO property, private lots and hotels offer additional parking spaces.

Within a quarter mile of the planned MCO Station, the South Park Place surface parking lot contains 2,740 spaces. MCO is proposing the construction of 3,500-space parking garage adjacent to the MCO Station.[12]

[9] City of Orlando, 2011. Transportation Element: Goals, Objectives and Policies. Approved August 12, 1991. Amended December 5, 2011.
[10] MCO Quickfacts. Summer 2013.
[11] Orlando Sentinel, April 28, 2013.
[12] Orlando Sentinel, July 29, 2013.

3.0 Railroad Crossing Analysis

The proposed ***North-South Corridor Alternative*** crosses six counties; Palm Beach, Martin, St. Lucie, Indian River, Brevard, and Orange. There are no at-grade crossings proposed along the ***East-West Corridor Alternative*** and therefore no highway-rail grade crossing are modeled for Brevard and Orange Counties adjacent to SR 528.

Annual Average Daily Volume (AADT) traffic data is available from the Florida Department of Transportation (FDOT) for arterials in the study area. These were sorted and the largest two arterials by volume for each county were selected for analysis.

The following major arterials with highway-rail grade crossings that traverse the existing FEC rail line for the proposed Project Area were analyzed:

- Palm Beach County
  - Banyan Boulevard Crossing – AADT 39,500
  - Northlake Boulevard Crossing – AADT 40,000
- Martin County
  - SE Indian Street Crossing – AADT 16,200
  - E Monterey Road Crossing – AADT 15,900
- St. Lucie County
  - Seaway Drive Crossing – AADT 6,600
  - North Causeway Crossing – AADT 8,200
- Indian River County
  - Oslo Road Crossing – AADT 12,400
  - 19th Place/20th Place Crossings – AADT 11,500
- Brevard County
  - Palm Bay Road Crossing – AADT 26,000
  - Pineda Causeway Crossing – AADT 40,000 AADT

These crossing locations along with adjacent intersections on both sides of the crossing were analyzed for Opening Year 2016 and Buildout Year 2036.

An exhibit for each crossing location is included in this report.

Exhibit 1. Existing Year 2012 Traffic Conditions – Palm Beach County. Banyan Boulevard Crossing.

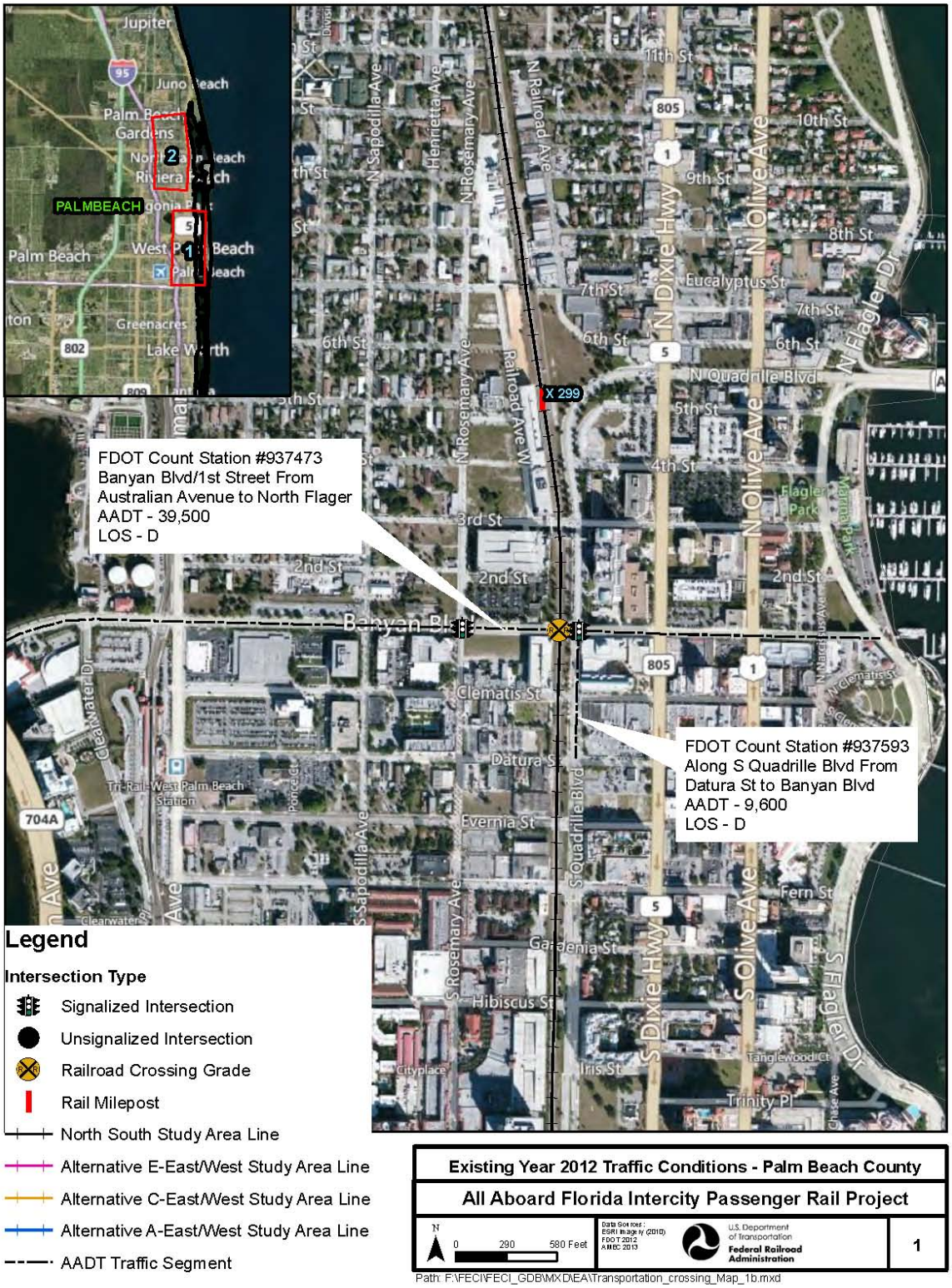


Exhibit 2. Existing Year 2012 Traffic Conditions – Palm Beach County. Northlake Boulevard Crossing.

Exhibit 3. Existing Year 2012 Traffic Conditions – Martin County. SE Indian Street Crossing.

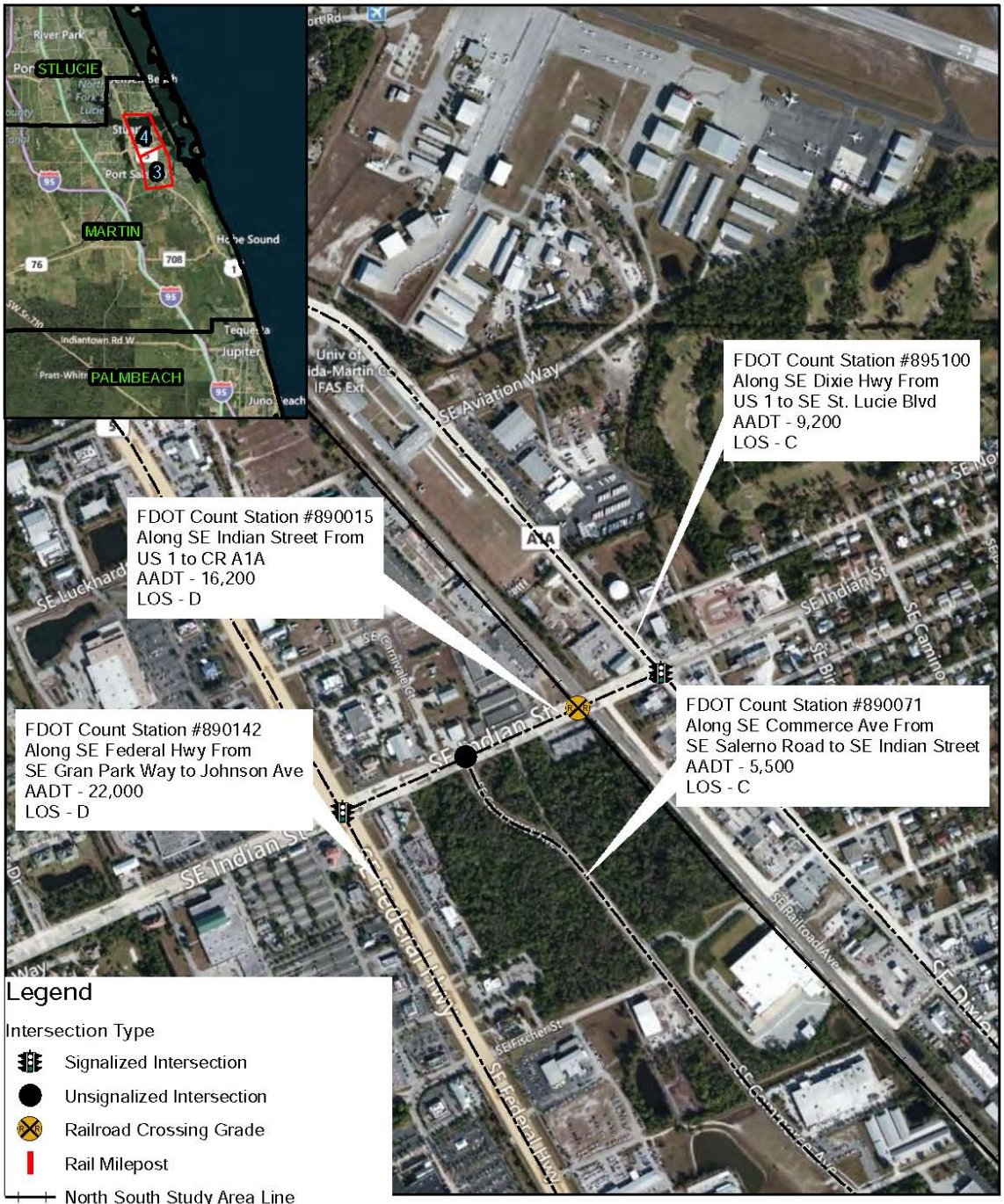


Exhibit 4. Existing Year 2012 Traffic Conditions – Martin County. SE Monterey Road Crossing.

Exhibit 5. Existing Year 2012 Traffic Conditions – St. Lucie County. Seaway Drive Crossing.

Exhibit 6. Existing Year 2012 Traffic Conditions – St. Lucie County. North Causeway Crossing.

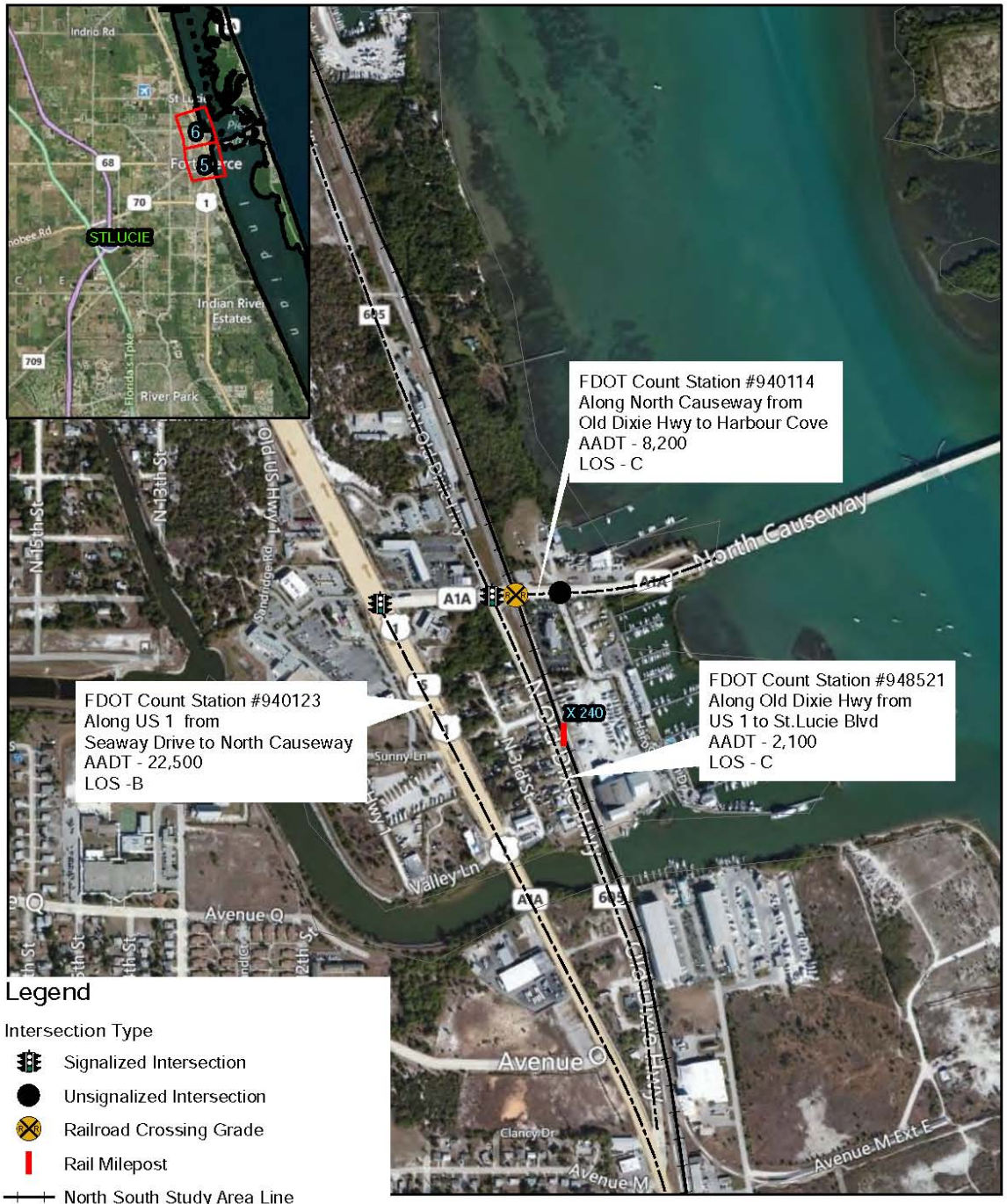


Exhibit 7. Existing Year 2012 Traffic Conditions – Indian River County. Oslo Road Crossing.

Exhibit 8. Existing Year 2012 Traffic Conditions – Indian River County. 19th Place/20th Place Crossing.

Exhibit 9. Existing Year 2012 Traffic Conditions – Brevard County. Palm Bay Road NE Crossing.

Exhibit 10. Existing Year 2012 Traffic Conditions – Brevard County. Pineda Causeway Crossing.

3.1 Methodology

The traffic analysis was performed using Synchro/SimTraffic analysis software based on procedures from the Highway Capacity Manual (HCM). The following procedures and assumptions were used in this analysis:

- Length of the train, speed, and clearance time requirements for closing and opening of the gates at the crossings are based on information from AAF, and in accordance with FRA and FDOT guidelines. Details of train characteristics, frequency, and clearance time area used in the traffic model are included in Table 3-1.
- Three railroad crossing events are assumed to take place during the PM peak hour. Two freight crossing and two passenger train crossings were modeled. This scenario constitutes a worst-case condition.
- The peak hour operations at the crossing were divided into three cycles. The first cycle represents no train crossing event. The second cycle represents a freight train crossing event. The third cycle represents a passenger train crossing event. Closure times were calculated for each of these cycles and the average closue time was calculated as the weighted hourly average of each of the three cycles.
- Level of service (LOS) for the approaches and intersections in the area near the crossing was calculated using the weighted average of the LOS for all cycles during the peak hour.

3.2 Traffic Data

Traffic data used in this analysis was obtained from FDOT. The 2012 AADT volumes were converted to Directional Design Hour Volumes (DDHV) based on guidance from the 2009 FDOT Quality/Level of Service Handbook[13]. The K100 and D100 factors were obtained from Table 3-4 of the FDOT Handbook. The DDHV was used in the model to simulate the conditions during the PM Peak Hour.

The turning movement counts were estimated from the DDHV by assuming the through movement accounts for 75% of the volume, the right turning movement accounts for 12.5%, and the left turning movement accounts for 12.5%.

A 2% heavy vehicle factor and a peak hour factor of 0.92 were used.

The 2012 volumes were grown at 1% per year to estimate the 2016 Opening Year and 2036 Buildout Year volumes. It should be noted that much of the study corridor has experienced no growth or negative growth in the past several years. Therefore the 1% growth rate represents a conservative assumption.

[13] Florida Department of Transportation. 2009 Quality/Level of Service Handbook. Available at: http://www.dot.state.fl.us/planning/systems/sm/los/.

Table 3-1. Summary of Rail Operating Characteristics and Average Crossing Closure for both Freight and Passenger Rail for Opening Year 2016

County	Time to Activate and Close the Gate (seconds)	Avg. Train Length (feet)	Avg. Train Speed (miles per hour)	Time to Clear (seconds)	Time to Bring the Gate Back Up (seconds)	Total Time to Activate and Clear (seconds)	Crossings (Trains per Day)	Closures per Day (minutes)	Maximum Train Crossings per hour	Maximum Closure Time per Hour (minutes)
2016 Freight										
Palm Beach	30	8150	54.3	102	15	147	28	68.8	2	4.9
Martin	30	8150	44.4	125	15	170	28	79.4	2	5.7
St Lucie	30	8150	47.8	116	15	161	28	75.2	2	5.4
Indian River	30	8150	54.2	103	15	148	28	68.9	2	4.9
Brevard	30	8150	53.8	103	15	148	28	69.2	2	4.9
2016 Passenger										
Palm Beach	30	725-900	89.2	6	15	51	32	27.3	2	1.7
Martin	30	725-900	79.5	7	15	52	32	27.7	2	1.7
St Lucie	30	725-900	92.6	6	15	51	32	27.2	2	1.7
Indian River	30	725-900	106.6	5	15	50	32	26.8	2	1.7
Brevard	30	725-900	98.1	6	15	51	32	27.0	2	1.7

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 account for the worst-case scenario, FDOT timings were used in this analysis.
2. Maximum crossings per hour includes north-bound and south-bound trains combined
3. 2016 freight and passenger information obtained from AAF via email October 2013.
4. 2016 freight speed obtained from CA20 TPC Runtimes Frt-RO.xlsx, received from AAF via email June 2013.
5. 2016 passenger speed obtained from CA20 TPC Runtimes-R2 w Revised EW Corridor.xlsx, received from AAF via email June, 2013.
6. Closure per Day calculated as the Train Crossings per Day multiplied by the Total Time to Activate and Clear, divided by 60.
7. Maximum Closure per Hour calculated as the Total Time to Activate and Clear multiplied by the Maximum Crossings per Hour, divided by 60.

3.3 Traffic Operational Analysis

Capacity analysis for all the crossings and intersections in the study area were conducted in accordance with the methodology presented in the Highway Capacity Manual[14] utilizing Synchro/Simtraffic software, Version 8.

Level of service provides a qualitative relationship between operational conditions. Signalized LOS ranges from "A" through "F", with "A" being the most free operating condition and "F" being the most restrictive. Generally LOS "D" or better is considered acceptable. LOS for signalized intersections is measured by control or signal delay per vehicle. Unsignalized LOS ranges from "A" through "H", with "A" being the most free operating condition and "H" being the most restrictive. Generally LOS "D" or better is considered acceptable. LOS for unsignalized intersections is calculated using the Intersection Capacity Utilization (ICU) method by taking a sum of critical volume to saturation flow ratios. Table 3-2 and Table 3-3 provides the delay ranges for the signalized and unsignalized LOS.

Table 3-2. Signalized Level of Service (LOS) 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

Table 3-3. Unsignalized Level of Service (LOS) Criteria

Level of Service	ICU (percent)
A	< 55
B	>55>64
C	>64>73
D	>73>82
E	>82>91
F	>91>100
G	>100>109
H	>109

For this project, intersections and railroad crossings were analyzed with conditions similar to the projected evening (PM) Peak Hour, to represent the maximum traffic volume during the day. Each location was analyzed without train crossings, with freight train crossings, and with passenger train crossings.

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 train crossing event is simulated. During the train crossing event the traffic movements not in conflict with the train crossing continue to operate normally.

[14] Institute of Transportation Engineers. Highway Capacity Manual 2010.

Since the train crossings occur approximately three times during the peak hour, the closure time for each crossing was calculated using the weighted average of the without train crossing, with freight train crossing, and with passenger train crossing closures.

Queue lengths were obtained for the 95th percentile queue as calculated by the Synchro/Simtraffic software. The 95th percentile queue represents the queue length that is not expected to be reached 95% of the time.

Results for closure times, LOS, and queue length are summarized for each crossing and adjacent intersections for 2016 and 2036 in the tables that follow.

Table 3-4. Banyan Boulevard Crossing in Palm Beach County (EB = East Bound Traffic; WB = West Bound Traffic)

Banyan Blvd Crossing - Opening Year 2016 Conditions															
	Normal Signal Cycle				**Freight Train Crossing Cycle**				**Passenger Train Crossing Cycle**				**Weighted Average**		
Approach/Movement	**Delay**	**LOS**	**Queue**	**Cycles/Hour**	**Delay**	**LOS**	**Queue**	**Cycles/Hour**	**Delay**	**LOS**	**Queue**	**Cycles/Hour**	**Delay**	**Queue**	**LOS**
Banyan Blvd @ S Quadrille Blvd															
Overall Intersection	59.4	E		40	186.8	F		2	184.2	F		2	70.9		E
EB Approach	77.9	E	696		103.8	D	1495		99.4	F	1485		80.1	768	F
WB Approach	41.7	D	622		208.5	F	4975		202.0	F	4880		56.6	1013	E
Banyan Blvd @ FEC RR Crossing															
Overall Intersection	1.6	A		40	173.6	F		2	171.9	F		2	17.2		B
EB Approach	2.3	A	0		216.7	F	7413		217.3	F	7349		21.8	671	C
WB Approach	0.9	A	0		126.9	F	6455		122.7	F	6353		12.2	582	B
Banyan Blvd Crossing - Year 2036 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
Banyan Blvd @ S Quadrille Blvd															
Overall Intersection	115.6	F		40	236.0	F		2	238.5	F		2	126.7		F
EB Approach	130.0	F	1032		153.3	F	1632		149.2	F	1683		131.9	1089	F
WB Approach	115.2	F	938		244.5	F	7504		239.3	F	7413		126.7	1531	F
Banyan Blvd @ FEC RR Crossing															
Overall Intersection	1.5	A		40	222.3	F		2	216.2	F		2	21.3		C
EB Approach	1.7	A	0		268.9	F	10446		263.7	F	10382		25.8	947	C
WB Approach	1.3	A	0		171.8	F	8506		164.7	F	8562		16.5	776	B

Table 3-5. Northlake Boulevard Crossing in Palm Beach County (EB = East Bound Traffic; WB = West Bound Traffic)

Northlake Blvd Crossing - Opening Year 2016 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
Northlake Blvd @ Old Dixie Hwy															
Overall Intersection	46.3	D		80	118.7	F		2	131.1	F		2	50.0		D
EB Approach	61.4	E	254		86.7	F	1747		101.9	F	1940		63.0	330	E
WB Approach	39.9	D	186		95.5	F	2894		107.6	F	2943		42.8	316	D
Northlake Blvd @ FEC RR Crossing															
Overall Intersection	0.4	A		80	25.6	C		2	29.6	C		2	1.7		A
EB Approach	0.5	A	0		23.3	C	2168		27.3	C	2419		1.7	109	A
WB Approach	0.3	A	0		28.2	C	1589		32.1	C	1652		1.7	77	A
Northlake Blvd @ Hwy 811/10th St															
Overall Intersection	55.7	E		64	142.0	F		2	147.9	F		2	61.0		E
EB Approach	75.1	E	384		57.0	E	2837		67.7	E	2930		74.4	503	E
WB Approach	62.2	E	337		107.6	F	2182		130.1	F	2421		65.5	431	E
Northlake Blvd Crossing - Year 2036 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
Northlake Blvd @ Old Dixie Hwy															
Overall Intersection	78.2	E		80	310.8	F		2	272.3	F		2	88.4		F
EB Approach	102.3	F	345		236.3	F	3424		204.3	F	3313		107.9	489	F
WB Approach	69.4	E	221		394.0	F	4015		329.1	F	3978		83.3	401	F
Northlake Blvd @ FEC RR Crossing															
Overall Intersection	0.4	A		80	57.4	E		2	38.7	D		2	2.7		A
EB Approach	0.4	A	0		70.7	E	4018		39.5	D	3612		3.0	182	A
WB Approach	0.4	A	0		43.0	D	2316		37.8	D	2153		2.3	106	A
Northlake Blvd @ Hwy 811/10th St															
Overall Intersection	101.2	F		64	382.9	F		2	307.9	F		2	115.6		F
EB Approach	147.3	F	533		286.3	F	4209		226.4	F	4138		153.7	706	F
WB Approach	104.3	F	471		550.6	F	3963		378.0	F	3662		125.7	630	F

Table 3-6. SE Indian Street Crossing in Martin County (EB = East Bound Traffic; WB = West Bound Traffic)

SE Indian Street Crossing - Opening Year 2016 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
SE Indian @ SE Dixie Hwy															
Overall Intersection	9.3	A		79	103.0	F		2	103.4	F		2	13.8		B
EB Approach	9.4	A	91		3.6	A	23		3.5	A	23		9.1	88	A
WB Approach	10.7	B	93		70.5	E	1084		69.2	E	1073		13.6	140	B
SE Indian @ FEC RR Crossing															
Overall Intersection	0.2	A		79	64.3	E		2	63.3	E		2	3.3		A
EB Approach	0.2	A	0		75.7	E	1412		74.3	E	1398		3.8	68	A
WB Approach	0.2	A	0		52.0	D	1533		51.4	D	1522		2.7	74	A
SE Indian @ E Commerce (Unsignalized)															
Overall Intersection		C				C				C					C
SE Indian Street Crossing - Year 2036 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
SE Indian @ SE Dixie Hwy															
Overall Intersection	11.2	B		79	108.2	F		2	112.6	F		2	16.0		B
EB Approach	10.7	B	115		3.6	A	29		3.6	A	29		10.4	111	B
WB Approach	14.7	B	120		75.9	E	1392		74.5	E	1378		17.6	181	B
SE Indian @ FEC RR Crossing															
Overall Intersection	0.0	A		79	70.0	E		2	69.1	E		2	3.4		A
EB Approach	0.0	A	0		82.3	F	1842		80.8	F	1824		3.9	88	A
WB Approach	0.0	A	0		56.6	E	1964		56.4	E	1956		2.7	94	A
SE Indian @ E Commerce (Unsignalized)															
Overall Intersection		E				E				E					E

Table 3-7. SE Monterey Road Crossing in Martin County (EB = East Bound Traffic; WB = West Bound Traffic)

SE Monterey Road Crossing - Opening Year 2016 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
Monterey Rd @ SE Dixie Hwy															
Overall Intersection	8.8	A		79	113.1	F		2	114.5	F		2	13.9		B
EB Approach	11.5	B	52		230.9	F	1007		239.0	F	1024		22.3	98	C
WB Approach	10.0	B	32		264.1	F	726		271.4	E	738		22.4	66	C
Monterey Rd @ FEC RR Crossing															
Overall Intersection	0.1	A		79	61.1	E		2	58.1	E		2	3.0		A
EB Approach	0.1	A	0		69.2	E	855		64.8	E	827		3.3	41	A
WB Approach	0.2	A	0		52.4	D	1486		50.9	D	1454		2.7	71	A
Hwy 714/Monterey Rd @ SE Federal Hwy															
Overall Intersection	10.9	B		79	10.6	B		2	10.6	B		2	10.9		B
EB Approach	9.8	A	78		9.8	A	78		9.8	A	78		9.8	78	A
WB Approach	13.1	B	100		13.1	B	100		13.1	B	100		13.1	100	B
SE Monterey Road Crossing - Year 2036 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
Monterey Rd @ SE Dixie Hwy															
Overall Intersection	11.0	B		79	118.1	F		2	122.6	F		2	16.3		B
EB Approach	11.2	B	61		239.5	F	1248		246.7	F	1270		22.4	119	C
WB Approach	9.8	A	38		269.6	F	890		296.2	F	905		23.0	79	C
Monterey Rd @ FEC RR Crossing															
Overall Intersection	0.1	A		79	67.8	E		2	63.9	E		2	3.3		A
EB Approach	0.1	A	0		77.9	F	1081		72.1	E	1046		3.7	51	A
WB Approach	0.2	A	0		56.9	E	1901		54.9	D	1860		2.9	91	A
Hwy 714/Monterey Rd @ SE Federal Hwy															
Overall Intersection	13.7	B		79	13.6	B		2	13.6	B		2	13.7		B
EB Approach	10.7	B	98		10.7	B	98		10.7	B	98		10.7	98	B
WB Approach	17.4	B	127		17.4	B	127		17.4	N	127		17.4	127	B

Table 3-8. Seaway Drive Crossing in St Lucie County (EB = East Bound Traffic; WB = West Bound Traffic)

Seaway Drive Crossing - Opening Year 2016 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
Seaway Dr @ US Hwy 1															
Overall Intersection	20.6	C		53	146.6	F		2	146.6	F		2	29.4		C
EB Approach	47.8	D	267		328.4	F	1007		328.4	F	2586		67.5	374	E
WB Approach	22.7	C	155		18.5	B	726		18.5	B	831		22.4	199	C
Seaway Dr @ FEC RR Crossing															
Overall Intersection	0.0	A		79	225.2	F		2	225.2	F		2	10.9		B
EB Approach	0.1	A	0		207.0	F	806		207.0	E	806		10.1	57	B
WB Approach	0.0	A	0		244.9	F	591		244.9	F	591		11.8	41	B
Seaway Dr @ 2nd St (Unsignalized)															
Overall Intersection		A				A				A					A
Seaway Dr @ Indian River Dr															
Overall Intersection	8.6	A		79	8.6	A		2	8.6	B		2	8.6		A
EB Approach	12.2	B	46		12.2	B	46		12.2	B	46		12.2	46	B
WB Approach	11.9	B	43		11.9	B	43		11.9	B	43		11.9	43	B
Seaway Drive Crossing - Year 2036 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
Seaway Dr @ US Hwy 1															
Overall Intersection	66.7	E		53	189.9	F		2	189.8	F		2	75.3		E
EB Approach	167.5	F	379		374.7	F	3992		374.7	F	3992		182.0	633	F
WB Approach	26.2	C	214		24.1	C	1054		24.1	C	1054		26.1	273	C
Seaway Dr @ FEC RR Crossing															
Overall Intersection	0.1	A		79	236.3	F		2	236.3	F		2	11.5		B
EB Approach	0.1	A	0		204.7	F	716		204.7	F	716		10.0	50	A
WB Approach	0.0	A	0		270.6	F	723		270.6	F	723		13.0	51	B
Seaway Dr @ 2nd St (Unsignalized)															
Overall Intersection		A				A				A					A
Seaway Dr @ Indian River Dr															
Overall Intersection	8.8	A		79	8.8	A		2	8.8	A		2	8.8		A
EB Approach	11.9	B	51		11.9	B	51		11.9	B	51		11.9	51	B
WB Approach	11.6	B	47		11.6	B	47		11.6	B	47		11.6	47	B

Table 3-9. North Causeway Crossing in St Lucie County (EB = East Bound Traffic; WB = West Bound Traffic)

North Causeway Crossing - Opening Year 2016 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
North Causeway @ US Hwy 1															
Overall Intersection	12.2	B		63	12.3	B		2	12.3	B		2	12.2		B
EB Approach	24.8	C	205		24.8	C	205		24.8	C	205		24.8	205	C
WB Approach	17.6	B	139		17.6	B	139		17.6	B	139		17.6	139	B
North Causeway @ Old Dixie Hwy															
Overall Intersection	10.3	B		79	88.1	F		2	86.6	F		2	14.0		B
EB Approach	13.0	B	105		56.4	E	675		35.8	D	539		14.6	135	B
WB Approach	9.3	A	42		1.0	A	34		0.7	A	24		8.9	41	A
North Causeway @ FEC RR Crossing															
Overall Intersection	0.5	A		79	25.1	C		2	17.5	B		2	1.5		A
EB Approach	0.8	A	9		22.5	C	1137		17.1	B	956		1.7	71	A
WB Approach	0.0	A	0		27.8	C	205		18.0	B	164		1.1	11	A
North Causeway @ Harbortown Dr (Unsignalized)															
Overall Intersection		A				A				A					A
North Causeway Crossing - Year 2036 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
North Causeway @ US Hwy 1															
Overall Intersection	22.5	C		63	22.5	C		2	22.5	C		2	22.5		C
EB Approach	32.8	C	277		32.8	C	277		32.8	C	277		32.8	277	C
WB Approach	19.5	B	180		19.5	B	180		19.5	B	180		19.5	180	B
North Causeway @ Old Dixie Hwy															
Overall Intersection	11.0	B		79	93.8	F		2	90.5	F		2	14.9		B
EB Approach	14.4	B	133		68.3	E	851		43.5	D	680		16.4	171	B
WB Approach	9.5	A	51		1.2	A	43		0.9	A	32		9.1	50	A
North Causeway @ FEC RR Crossing															
Overall Intersection	0.6	A		79	27.4	C		2	19.1	B		2	1.7		A
EB Approach	1.2	A	16		26.5	C	1500		19.8	B	1256		2.3	97	A
WB Approach	0.0	A	0		28.3	C	252		18.4	B	202		1.1	14	A
North Causeway @ Harbortown Dr (Unsignalized)															
Overall Intersection		A				A				A					A

Table 3-10. Oslo Road Crossing in Indian River County (EB = East Bound Traffic; WB = West Bound Traffic)

Oslo Road Crossing - Opening Year 2016 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
Oslo Rd @ Old Dixie Hwy															
Overall Intersection	11.0	B		80	95.1	F		2	95.1	F		2	15.0		B
EB Approach	11.8	B	74		182.0	F	1436		181.3	F	1434		19.9	139	B
WB Approach	13.6	B	85		3.6	A	3		3.6	A	3		13.1	81	B
Oslo Rd @ FEC RR Crossing															
Overall Intersection	0.1	A		80	148.8	F		2	148.5	F		2	7.2		A
EB Approach	0.1	A	0		82.3	F	1705		82.0	F	1701		4.0	81	A
WB Approach	0.1	A	0		220.9	F	1299		220.6	F	1299		10.6	62	B
Oslo Rd @ US Hwy 1															
Overall Intersection	18.8	A		80	143.9	F		2	143.9	F		2	24.8		C
EB Approach	29.3	C	264		144.3	F	4349		142.1	F	4326		34.7	458	C
WB Approach	22.7	C	242		224.9	F	3072		223.9	F	3066		32.3	377	C
Oslo Road Crossing - Year 2036 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
Oslo Rd @ Old Dixie Hwy															
Overall Intersection	12.1	B		80	101.4	F		2	101.3	F		2	16.4		B
EB Approach	12.7	B	94		193.8	F	1821		193.0	F	1817		21.3	176	C
WB Approach	14.6	B	104		5.7	A	89		5.6	A	88		14.2	103	B
Oslo Rd @ FEC RR Crossing															
Overall Intersection	0.1	A		80	148.2	F		2	147.8	F		2	7.1		A
EB Approach	0.2	A	0		87.7	F	2223		87.5	F	2219		4.4	106	A
WB Approach	0.1	A	0		213.7	F	1600		213.0	F	1594		10.3	76	B
Oslo Rd @ US Hwy 1															
Overall Intersection	33.8	C		80	259.9	F		2	258.3	F		2	44.5		D
EB Approach	80.0	F	378		669.9	F	7172		656.2	F	7148		107.8	701	F
WB Approach	38.3	D	323		306.2	F	4107		303.0	F	4099		51.0	503	D

Table 3-11. 19th Place/20th Place Crossing in Indian River County (EB = East Bound Traffic; WB = West Bound Traffic) (page 1 of 2)

19th Place/20th Place Crossing - Opening Year 2016 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
19th Pl @ Commerce Ave															
Overall Intersection – One Way Traffic	8.9	A		80	49.3	D		1	49.6	D		2	10.8		B
EB Approach	10.6	B	49		2.3	A	0		2.3	A	0		10.2	47	B
19th Pl @ FEC RR Crossing															
Overall Intersection– One Way Traffic	0.1	A		80	129.5	F		1	128.4	F		2	6.2		A
EB Approach	0.1	A	0		129.5	F	867		128.4	F	863		6.2	41	A
20th Pl @ Commerce Ave															
Overall Intersection– One Way Traffic	8.4	A		80	136.8	F		1	136.5	F		2	14.5		B
WB Approach	10.9	B	38		123.5	F	608		122.4	F	606		16.2	65	B
20th Pl @ FEC RR Crossing															
Overall Intersection– One Way Traffic	0	A		80	58.4	E		1	58.0	E		2	2.8		A
WB Approach	0.0	A	0		58.4	E	391		58.0	E	386		2.8	19	A
19th Place/20th Place Crossing - Year 2036 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
19th Pl @ Commerce Ave															
Overall Intersection– One Way Traffic	9.2	A		80	50.3	D		1	50.7	D		2	11.2		B
EB Approach	10.6	B	60		2.4	A	0		2.4	A	0		10.2	57	B
19th Pl @ FEC RR Crossing															
Overall Intersection– One Way Traffic	0.1	A		80	134.0	F		1	132.8	F		2	6.4		A
EB Approach	0.1	A	0		134.0	F	1080		132.8	F	1075		6.4	51	A
20th Pl @ Commerce Ave															
Overall Intersection– One Way Traffic	8.4	A		80	140.2	F		1	139.9	F		2	14.7		B
WB Approach	10.2	B	41		126.7	F	750		125.6	F	747		15.7	75	B

Table 3-11. 19th Place/20th Place Crossing in Indian River County (page 2 of 2)

20th Pl @ FEC RR Crossing															
Overall Intersection– One Way Traffic	0.0	A		80	58.7	E		1	58.4	E		2	2.8		A
WB Approach	0.0	A	0		58.7	E	526		58.4	E	523		2.8	25	A

Table 3-12. Palm Bay Road NE Crossing in Brevard County (EB = East Bound Traffic; WB = West Bound Traffic)

Palm Bay Road Crossing - Opening Year 2016 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
Palm Bay Rd @ N Main St NE (Unsignalized)															
Overall Intersection		H				H				H					H
Palm Bay Rd @ S Main St NE (Unsignalized)															
Overall Intersection		H				H				H					H
Palm Bay Rd @ FEC RR Crossing															
Overall Intersection	3.5	A		53	68.5	E		2	12.1	B		2	6.1		A
EB Approach	4.4	A	3		78.6	E	6635		14.0	B	2229		7.3	314	A
WB Approach	2.6	A	0		57.5	E	4878		10.1	B	1637		4.8	229	A
Palm Bay Rd @ Maplewood St (Unsignalized)															
Overall Intersection		H				H				H					H
Palm Bay Rd @ Orange Blossom Trail (Unsignalized)															
Overall Intersection		H				H				H					H
Palm Bay Road Crossing - Year 2036 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
Palm Bay Rd @ N Main St NE (Unsignalized)															
Overall Intersection		H				H				H					H
Palm Bay Rd @ S Main St NE (Unsignalized)															
Overall Intersection		H				H				H					H
Palm Bay Rd @ FEC RR Crossing															
Overall Intersection	14.6	B		53	132.2	F		1	44.9	D		2	19.8		B
EB Approach	19.3	B	81		146.4	F	12206		57.4	E	10957		25.1	888	C
WB Approach	9.5	A	48		116.9	F	10589		31.4	C	4332		14.0	568	B
Palm Bay Rd @ Maplewood St (Unsignalized)															
Overall Intersection		H				H				H					H
Palm Bay Rd @ Orange Blossom Trail (Unsignalized)															
Overall Intersection		H				H				H					H

Note: Unsignalized intersections use different LOS criteria and are rated A through H.

Table 3-13. Pineda Causeway Crossing in Brevard County (EB = East Bound Traffic; WB = West Bound Traffic)

Pineda Causeway Crossing - Opening Year 2016 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
Pineda Causeway @ Holy Trinity Dr															
Overall Intersection	48.9	D		21	80.3	F		2	63.6	E		2	52.6		D
EB Approach	5.6	A	373		28.8	C	2292		13.0	B	1491		8.0	616	A
WB Approach	78.4	E	461		73.2	E	2715		50.7	D	2555		75.8	809	E
Pineda Causeway @ FEC RR Crossing															
Overall Intersection	0.8	A		21	34.0	C		2	18.4	B		2	4.9		A
EB Approach	0.9	A	0		34.2	C	3899		21.2	C	2905		5.2	544	A
WB Approach	0.7	A	0		33.4	C	2546		15.4	B	1657		4.5	336	A
Pineda Causeway Crossing - Year 2036 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
Pineda Causeway @ Holy Trinity Dr															
Overall Intersection	157.4	F		21	185.3	F		2	128.5	F		2	157.3		F
EB Approach	8.9	A	648		41.4	D	3747		18.8	B	2438		12.3	1039	B
WB Approach	302.5	F	727		293.2	F	3808		183.5	F	3664		292.2	1208	F
Pineda Causeway @ FEC RR Crossing															
Overall Intersection	1.6	A		21	79.1	E		2	36.0	D		2	10.6		B
EB Approach	1.8	A	0		61.8	E	6651		40.3	D	4683		9.7	907	A
WB Approach	1.3	A	0		97.8	F	4329		31.3	C	2818		11.4	572	B

4.0 Environmental Consequences

4.1 Transportation

4.1.1 Rail Transportation Impacts

The proposed Project passenger operations would include 16-19 round-trip trains per day, which amounts to a maximum frequency of two trains crossings per hour. Maximum operating speeds would range from 79 to 125 miles per hour, depending upon the location along the North-South or East-West Corridor. Operating speeds will be greatest along the East-West Corridor due to the absence of any highway-rail grade crossings. From the station in West Palm Beach to the station at MCO, service would be non-stop, as there are no stations proposed between those stations.

The demand for freight capacity is expected to grow along the North-South Corridor. Based on anticipated operations data for the 2016 opening year, the number of freight crossings per day is expected to increase from 18 (in 2011) to 28 along with an increase in the average length to 8,150 feet. An increase in freight efficiency is also anticipated, as represented by increases in average operating speeds. Table 3-1 shows a summary of 2016 freight and passenger operational characteristics, along with calculated closure times at roadway crossings.

The demand for freight capacity is also expected to grow along the North-South Corridor. Based on data provided in the EA, an annual freight growth rate of 3 percent was assumed and incorporated as increased train frequency and length. An increase in freight efficiency was also incorporated, as represented by increases in average operating speeds. Table 3-1 shows a summary of future freight and passenger operational characteristics.

The North-South Corridor has been designed to cause no adverse impact on freight operations within the North-South Corridor, and may have a beneficial impact on freight operations. The addition of passenger rail service within the existing ROW would require modifying the mostly single track system to a mostly double track system, which would be used by both passenger and freight operations.

There are no existing freight rail operations within the East-West Corridor, therefore no impacts would occur under ***East-West Corridor with Alternatives A, C or E***.

4.1.1.1 No Build Alternative

The ***No Build Alternative*** would not cause significant adverse impacts to rail transportation. Under the ***No Build Alternative***, there would be no passenger train service added from West Palm Beach to Cocoa and the existing freight infrastructure would be maintained. Freight train configurations would be expected to incorporate the anticipated annual growth of approximately 3 percent through increases in train length and/or speed. The ***No Build Alternative*** would not result in any delays or impacts related to construction of stations or other infrastructure required for the proposed Project. The upgrades to the FEC Corridor contemplated as part of the Project would not, however, occur in the near term as part of the ***No Build Alternative***.

4.1.1.2 Build Alternative

The ***Build Alternative***, which includes the ***North-South Corridor Alternative,*** the ***East West Corridor Alternatives*** and the ***MCO Alignment and VMF Alternative***, would have a beneficial impact on existing freight traffic along the North-South Corridor, due to the proposed infrastructure expansion previously discussed. The ***Build Alternative*** would also have a beneficial impact on the passenger rail transportation network between West Palm Beach and Orlando by providing potential customers with an alternative means of rail transportation. The Proposed Action is designed to provide a direct, non-stop rail service from West Palm Beach to the MCO, which is a different service geographically and functionally compared to the existing Amtrak service. The ***Build Alternative***

would also provide more frequent and regular service, which would provide more flexibility to potential customers.

4.1.1.3 Construction Impacts

New track construction required for the ***Build Alternative*** will be performed according to best management practices so that minimal temporary adverse impacts to existing freight operations will be experienced. Any required maintenance or rehabilitation of the existing single track will also be done using planning and construction practices that would minimize impact to existing freight traffic. Future required maintenance and rehabilitation will also be done more efficiently as track operators will be able to use planning practices that utilize the additional tracks to mitigate temporary delays. AAF is familiar with projects (for example the Union Pacific Railroad in northern California) that have implemented similar single track to double track upgrades without causing any impact to passenger or freight service during construction. AAF plans on utilizing similar techniques and methods to reduce or eliminate potential impacts such as delays or downtime.

4.1.2 Regional Roadway Network Impacts

According to the "*Vision Plan*"[15] discussed in the Purpose and Need Statement, it is estimated that the total intercity travel person trips between Miami and Orlando will increase from 9.5 million in 2000 to 18.5 million by 2020, with further increase to 30.5 million by 2040.

The Proposed Action may help to alleviate the growth in congestion that is expected as a result of these trips. For the Proposed Action, an investment grade evaluation was prepared to estimate annual ridership. That report, prepared by The Louis Berger Group, Inc., will be provided as a separate submittal that will become an appendix to the EIS.

Among other things, that report describes a Base Case for ridership, as well as a Business Plan Case that accounts for certain elements important to future ridership potential, which are not included in the Base Case. Following this forecast, AAF's management further refined its strategies and goals for ridership and revenue which are reflected in a Management Case scenario.

These forecast scenarios can be summarized as follows:

1) *Base Case* – The Base Case scenario provides a conservative outlook for implementation of AAF service. The scenario does not include potential future changes to the proposed AAF service, such as additional future station locations; and does not include consideration of future changes to the relevant transportation network that are subject to some level of uncertainty, such as impact of the growth in congestion on major highways and arterials in the market area, or the impact of potential direct connections with local transit improvements planned by local and regional agencies.
2) *Business Plan Case* – An alternative scenario was prepared to account for elements of the AAF business plan under development at the time the forecast was originally prepared; and to reflect the impact of a number of specific items not included in the Base Case. The Business Plan Case includes: (i) future connections to other transit services, such as SunRail in Central Florida and the WAVE Streetcar in Fort Lauderdale; (ii) marketing initiatives targeted to resort customers and travel arrangers to enhance ridership.
3) *Management Case* – The Business Plan Case does not include the impact of certain strategies that are commonly employed by management of similar consumer-oriented rail operating companies and that could potentially further increase ridership and/or revenue such as (i) revenue yield management strategies; (ii) frequent rider loyalty programs; (iii) block ticket agreements with resorts and educational institutions; and (iv) plans for further local transit connections not known at the time of preparation of the Business Plan Case forecast. Following

[15] Florida Department of Transportation (FDOT). 2004-2006. Florida Intercity Passenger Rail "Vision Plan".

the preparation of the Base and Business Plan Case forecasts, AAF's management developed an estimate of the ridership impact of these strategies through market soundings, discussions with regional businesses and institutions, and discussions with rail operators.

The analysis of each case is presented in more detail in the above-referenced ridership study prepared by The Louis Berger Group, Inc. (LBG). Based on that analysis, the projected ridership was analyzed to determine the manner in which the Proposed Action would impact the regional roadway network. It is projected that 344 vehicles per day would be removed from the roads as a result of the Proposed Action for the 2016 Base, Business Plan and Management Cases and 1,214 vehicles would be removed per day for the 2019 Base, Business Plan and Management Cases.

4.1.2.1 No Build Alternative

Given the projected increase in intercity traffic, the No Build Alternative has the potential to contribute to future adverse transportation impacts on I-95, Florida's Turnpike and SR528 by not aiding in the reduction of the projected increase in total automobile volume on these roads. Without the added capacity provided by the proposed passenger service, these roads would be forced to absorb the majority of this increase.

4.1.2.2 Build Alternative

Implementation of the ***Build Alternative*** would have a beneficial effect on regional roadway transportation networks by providing additional transportation capacity between Miami and Orlando. Construction and operation of the ***North-South Corridor Alternative and East-West Corridor Alternatives*** would reduce the cumulative traffic volume on I-95, Florida's Turnpike and SR 528 by removing vehicles and providing an easily accessible and efficient alternative means of transport to residents and visitors between the Miami, Fort Lauderdale, West Palm Beach and Orlando areas. The loss of toll revenues to the Orlando-Orange County Expressway Authority (OOCEA) will be immaterial based on the *Impacts of AAF on OOCEA Toll Revenues* Report[15] prepared by Steer Davies Gleave.

4.1.2.3 Secondary and Cumulative Impacts

The Project is anticipated to enhance regional roadway transportation by reducing vehicles on the regional roadway network. By reducing vehicles traveling on the regional roadways, accident rates, pollution, and needs for roadway maintenance would be reduced. With a reduction in traffic accidents, public safety officers, emergency medical service technicians, and public works department employees would be redeployed to other duties. Travel delays caused by accidents would be reduced and therefore, downtime for people and vehicles that would otherwise be engaged in economically productive activities would be reduced. With fewer passenger vehicles on regional roadways, air pollution from emissions and water pollution from the runoff of gas and oil from roadways would be reduced. With fewer vehicles traveling on the regional roadways, a slight reduction in roadway maintenance due to wear and tear would occur.

4.1.3 Local Vehicular Transportation Impacts

Along the North-South Corridor, potential impacts may result from the addition of passenger rail service to the existing ROW through increased traffic delays at existing roadway crossings. Changes to traffic delays resulting from the various build alternatives are discussed below.

Table 4-1 provides the roadway names, number of lanes and the maximum design speed for passenger train operations in each County. To reduce the table size, only data for State Roads, County Roads, and US Highways were included. The maximum design speed for passenger trains along the North-South Corridor is greater than the maximum design speed of 79 mph south of the

West Palm Beach. Because there are fewer crossings and stops north of West Palm Beach, average freight speeds tend to be greater as well.

Table 4-1. Maximum Passenger Rail Speeds at State Road, County Road and US Highway Crossings (page 1 of 2)

Road Name	Highway Type	Number of Lanes	Speed
Brevard County			
Dixon Blvd	CR-0503	4	100
King St.	SR 0520	5	110
Poinsett Dr / Rosa L Jones Blvd	CR-5024	2	110
Barton Ave	CR-5026	6	110
Barnes Blvd	SR-502	5	110
Pineda Causeway	SR0404	4	110
Post Rd	CR5042	4	110
Parkway Ave	CR-5046	3	110
Lake Washington Rd	CR-5052	5	110
Aurora Rd.	CR0511	4	110
Sarno Rd	SR518-5	4	110
Babcock St.	CR0507	6	110
Nasa Blvd	CR-5056	4	110
Hibiscus Ave	CR 5060	4	110
Fee Ave	CR-5062	2	110
Strawbridge Ave	US192	4	110
New Haven Ave	SR 0192	2	110
Prospect Ave	CR-5077	2	80
University Blvd	CR5066	4	110
N.E. Palm Bay Rd	CR5070	2	110
N.E. Port Blvd	CR5074	4	110
8080Malabar Rd	SR 0514	2	110
Valkaria Rd	CR-5076	2	110
1st St.	CR-5078	2	110
Micco Rd	CR-5082	2	110
Indian River County			
Roseland Rd	SR 0505	2	110
Fellsmere St.	SR 0512	3	110
W. Wabasso Rd	SR 0510	2	110
S. Wntr Bch (65st)	SR 0632	2	110
41st St / So. Gifford Rd	CR0630	2	110
20th Place	SR 0060	4	110
Glendale Rd	CR0612	3	110
Ninth St. SW / Oslo Rd	SR 0606	4	110
St Lucie County			
City Causeway	SR A1A	5	110
Orange Ave	SR A1A	2	80
Midway Ave	CR0712	2	110
Martin County			
Jenson Beach Blvd	SR 707A	4	110
SR-AIA	SR 0707	2	60
Colorado Ave	SR 0010	4	80
SR-AIA	SR0AIA	2	110
Indian Ave	SR A1A	4	110
Salerno Rd	SR 0722	3	110
SR-AIA	SR A1A	2	110
Bridge Rd	SR 0707	2	110

Table 4-1. Maximum Passenger Rail Speeds at State Road, County Road and US Highway Crossings (page 2 of 2)

Road Name	Highway Type	Number of Lanes	Speed
Palm Beach County			
Indiantown Rd.	SR 0706	8	110
Lake Park Rd	CR-809	6	110
Inlet Blvd	SR0710	4	110
45th St.	SR 0702	5	110

Source: FEC Grade Crossing Estimate[5]

4.1.3.1 Build Alternative

The ***North-South Corridor Alternative*** and ***East-West Corridor Alternatives*** would not have a significant impact on local vehicular traffic along the North-South Corridor, and would have no impact on local vehicular traffic along the East-West Corridor. The increase in number of crossing events due to the addition of 16-19 round trips per day would cause additional closure events, but closures from passenger trains would be much shorter than closures from existing freight traffic (Tables 2-1 and 3-1). Also, the projected annual increase in freight capacity would result in minor increases in local roadway crossing closures, but total impacts relative to existing conditions would be minimal.

Table 4-2 shows expected roadway crossing closures times in the counties north of West Palm Beach as compared to the counties south of West Palm Beach. Closure times are provided for both passenger and freight operations from the 2016 project opening year.

Table 4-2. Comparison of Roadway Crossing Closures for the Project Area in 2016

County	Number of Crossings	Freight		Passenger	
		Train Speed (miles per hour)	Maximum Closure (minutes/hour)	Train Speed (miles per hour)	Maximum Closure (minutes/hour)
Palm Beach (N of Station)	26	54.3	4.9	89.2	1.7
Martin	25	44.4	5.7	79.5	1.7
St Lucie	20	47.8	5.4	92.6	1.7
Indian River	30	54.2	4.9	106.6	1.7
Brevard	55	53.8	4.9	98.1	1.7

Notes:
1. 2016 freight speed obtained from CA20 TPC Runtimes Frt-RO.xlsx, received from AAF via email June 2013.
2. 2016 passenger speed obtained from CA20 TPC Runtimes-R2 w Revised EW Corridor.xlsx, received from AAF via email June, 2013.
3. Maximum Closure per Hour calculated as the Total Time to Activate and Clear multiplied by the Maximum Crossings per Hour, divided by 60.

The traffic model shows that implementation of passenger rail operations would result in no significant impact to local roadway traffic along the portion of the North-South Corridor from West Palm Beach to Cocoa.

There are no proposed highway-rail grade crossings along the East-West Corridor.

The VMF would not have a significant impact on local vehicular transportation. Assuming facility operations would require 100 employees per day and each employee, in addition to arriving and leaving from work each day, left an average of once during the day for lunch, meetings, and errands. The estimated maximum number of trips that would be generated each day is 400. This traffic would access the station via Boggy Creek Rd from either the northwest or southeast. In 2012, the AADT for these portions of Boggy Creek Rd were 13,000 and 9,300, respectively (TM 4). If employee access is distributed evenly between both access directions, the increase in AADT would consume 1.5 percent of current capacity in the northwest direction and 2.2 percent in the southeast direction.

4.1.3.2 No Build Alternative

The **No Build Alternative** would not have a significant impact on local vehicular traffic. Based on data provided in Table 3-1, the projected annual increase in freight capacity would result in minor increases in local roadway crossing closure times, but increases would be minimal relative to current closure times.

4.1.3.3 Secondary and Cumulative Impacts

Secondary and cumulative impacts to local vehicular transportation are anticipated to be minimal. The Project is anticipated to have minimal negative secondary and cumulative impacts at roadway crossings and on local roadway capacity. Adjusting traffic signal timing in the Project Area is a BMP that would reduce traffic impacts.

5.0 Summary

Based on the analysis of the 2016 Opening Year and 2036 Buildout Year with and without the freight and passenger train services, the following conclusions were reached:

- The passenger trains are expected to clear the crossing in 52 seconds or less (depending on the County) and for two events to occur during the peak hour. The analysis indicates that the additional delay to the adjacent roadway network caused by the introduction of passenger rail service is minimal.
- Since this analysis was conducted to simulate the PM Peak Hour volume, any event taking place during non-peak hours is assumed to have less impact on traffic operations.
- By introducing passenger trains the traffic operations and LOS at nearby intersections are anticipated to continue to operate at LOS similar to the existing LOS during a freight train crossing. Therefore the additional impact from the passenger rail services is minimal.
- Even though not accounted for in this analysis, the passenger train services is expected to benefit some north-south roadways in the study area as a result of the use by commuters of the rail service in lieu of travel by automobile.
- It should be noted that some crossings have intersections within close proximity (less than 100 feet of the crossing) and that the usage of proper signage and traffic control will alert drives about the railroad crossings in accordance with applicable laws.

6.0 References

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