



## ON-SITE ENGINEERING FIELD REPORT – Part 1

### — All Aboard Florida —

#### **Background:**

FRA Headquarters, in conjunction with the Region 3 office, assisted in the diagnostic safety review of the Florida East Coast (FEC) Railway grade crossings between Miami-Dade to St. Lucie counties. This is due to High Speed Passenger Rail service being planned between Miami and Orlando, known as “All Aboard Florida”. Beginning February 4, 2014 and ending on March 7, 2014, a total of 263 public and private grade crossings were assessed. Participants included officials from Florida Department of Transportation (FDOT), FEC, All Aboard Florida (AAF); including local city and county officials at some locations.

For the purposes of this report, Part 1 represents the diagnostic review taken place from Miami-Dade to St. Lucie Counties. Part 2 designates the diagnostic review from Indian River County to Cocoa Beach, which is expected to occur in mid-to-late June 2014. There are approximately 90 grade crossings in Part 2. The segment between Cocoa Beach and Orlando will be designed for 125 MPH, however, AAF will not be traversing over any at-grade crossings along that rail corridor.

#### **Scope:**

Crossing locations between Miami to north of West Palm Beach are being designed for a maximum authorized speed of 79 MPH. The 110 MPH segment begins/ends at 30<sup>th</sup> Street in West Palm Beach (milepost 297.40), and continues through the Private Road Crossing in Indrio (milepost 233.90). Within the 110 MPH segment, train speeds are lowered to conventional rail limits where civil constraints exist; such as curves or draw bridges, which are noted on the accompanying field design plans.

Currently the design plans are at 30%. The next reiteration will be at 90%. Therefore, the decisions for the grade crossing signaling equipment and warning devices will be determined fairly soon.

The existing crossing signaling equipment contain a mix of signal cases and relay houses, equipped with either Phase Motion Detectors (PMD-1) or HXP 3R2's highway crossing processors.

Each crossing location will eventually consist of relay houses equipped with GE Transportation's ElectroLogIXS XP4 for constant warning time as part of this project. For 110 MPH, the crossing circuits beyond the 79 MPH standard will utilize a GE device linked through the PTC system for the advanced crossing starts. The technology will diagnose a health check to determine whether or not all roadway/pedestrian gates are in the down position.

### **Results:**

Of the 263 grade crossings in Part 1, there are 57 crossing locations affected for Sealed Corridor treatments within the 110 MPH territory. Officials from All Aboard Florida passenger rail project (herein the "Project") have openly expressed that the proposed 110 MPH segment will NOT incorporate the "Sealed Corridor" concept as outlined in FRA's Highway-Rail Grade Crossing Guidelines for High-Speed Passenger Rail, Version 1.0 (*November 2009*). They stated that since these are "guidelines, not regulations" as quoted on page *iii*, in which they are not obligated to incorporate any of the described crossing treatments as illustrated in the document. The Project estimates that in doing so would incur an additional financial burden of about \$47 mil.

In my professional opinion, I respectfully disagree with the Project's approach in that they are not exercising appropriate safety practices and reasonable care when designing for High Speed Passenger Rail service. I explained to the entire diagnostic team how important it was to adopt the principles of the Sealed Corridor approach. However, it was clearly evident that the Project was not pursuing such concept.

As a result, the Project has directed their signaling engineering consultants to design crossings to ONLY accommodate for the additional track while complying with the MUTCD - but not to incorporate any of the Sealed Corridor treatments. Furthermore, since there is a completely different philosophical view towards safety between the Project and I, the accompanying marked-up design plans and field notes are notably different from the Project's design plans; particularly along the 110 MPH segment. The Project has been maintaining a running log noting my Sealed Corridor recommendations.

Officials from FDOT's Rail Office are not taking a position, one way or the other, at this time.

## **Safety Recommendations:**

The following are recommendations made to the Project based upon my on-site field assessments during the diagnostic safety review:

- A. Pedestrian gates** – there are certain locations along the corridor in which sidewalks are present on both sides of the railroad right-of-way, but do not follow through. Some of these sidewalks do not comply with today’s ADA’s standards, however pedestrian travel is evident due to the worn foot path on the surface, and general witnessing of usage. Typically the roadway gate covers the entrance side of the adjacent sidewalk, but there are no pedestrian gates on the opposite quadrants. The Project stated if there is no agreement with the city or county for the service and maintenance of a pedestrian gate assembly, they will not install them.

Trespassing is an epidemic along this corridor. Rather than encourage it, it is recommended per my field notes at those particular locations to equip sidewalk approaches with a visual and gated barrier. This is to provide safe passage of pedestrians through a very active rail line and prevents those from walking into an open railway corridor; or directing them onto the street – irrespective if there is an agreement or not.

- B. Vehicle Presence Detection** – for those public and private crossings between 80-110 MPH in Part 1 to be equipped with a Vehicle Presence Detection (“VPD”) system. The entire FEC corridor is equipped with Cab Signaling control. Presence detection will serve as a long term obstacle system, where the presence of a vehicle within the crossing area for a fixed length of time would be reported as an alarm through the remote monitoring system, irrespective of the approach of a train. Subsequently, for those 3-Quadrant and 4-Quadrant gated grade crossings between 80-110 MPH (as identified further below), it is recommended that either through the activation of a loop detector and/or a vertical exit gate (indicating a roadway vehicle is occupying the crossing) that a vehicle is detected by the train as a “feedback loop” of information; resulting in a loss of cab-signals, thus placing the train in an automatic speed restriction.

Motor vehicles stalled, or trapped on a crossing due to queuing, present a derailment hazard; and in multiple track territory or where freight equipment is standing on adjacent sidings or industry tracks, derailments can result in catastrophic secondary collisions. Therefore, presence detection providing feedback to the train control system to high speed

trains traveling along this FEC corridor be active in order to minimize the possibility of derailments as well.

Recommending a VPD system is due to the following safety reasons:

1. Field observations with vehicular traffic stopping on tracks
2. Safety concerns expressed by city, county and FDOT officials
3. Several crossings with reduced or no vehicle clearance at roadway T-intersections
4. Vehicles yielding to oncoming traffic while on tracks at non-signalized T-intersections
5. Motorists / Commercial Vehicles queuing over tracks due to 4-way stop intersection, and vehicles entering adjacent driveways and parking lots
6. The multiple track surfaces enables motorists to make U-turns or cut thru's easier
7. Severely skewed crossings
8. Acute-angled crossings with main gates perpendicular to the vehicular roadway

**C. Sealed Corridor Treatments** - the following grade crossing locations are the recommended Sealed Corridor Treatments required by the Project to install:

<b>Four-Quadrant Gates (also referred as exit gates) (41)</b>			
<b>Street Name</b>	<b>City/Town</b>	<b>Milepost</b>	<b>DOT #</b>
30 <sup>th</sup> Street	West Palm Beach	297.40	272 406 J
Inlet Blvd.	Rivera Beach	295.45	272 400 T
Flagler Street	Rivera Beach	295.15	272 399 B
Silver Beach Road	Lake Park	293.75	272 389 V
Park Ave	Lake Park	293.30	272 387 G
Richard Road	Palm Beach Gardens	292.20	272 385 T
Lighthouse Drive	Palm Beach Gardens	291.70	272 384 L
RCA Blvd.	Palm Beach Gardens	290.30	272 382 X
Fred Small Road	Jupiter	286.20	273 020 P
Toney Penna Dr. *	Jupiter	284.20	272 378 H
Gleason Street	Hobe Sound	274.50	272 367 V
Bridge Road	Hobe Sound	274.10	272 366 N
Pettway Street	Hobe Sound	272.70	272 365 G
Crossrip Street	Salerno	271.40	272 362 L
Osprey Street	Salerno	270.90	272 934 K
Cove Road	Salerno	267.14	272 359 D
Broward Street	Salerno	266.80	272 358 W
Salerno Road	Salerno	266.60	272 357 P
Seaward Street **	Salerno	266.50	272 356 H

Monterey Road	Stuart	263.30	272 353 M
SR A1A	Stuart	262.50	272 350 S
Florida Street	Stuart	262.30	272 349 X
Palmetto Drive	Rio	257.40	272 342 A
Jenson Beach Blvd.	Rio	256.80	272 340 L
Pitchford Land***	Rio	256.20	272 338 K
Skyline Drive	Rio	255.50	272 337 D
County Line Road	Rio	255.30	272 336 W
Walton Road	Walton	252.50	272 332 U
Midway Road	Walton	246.30	272 331 M
Savannah Road	Fort Pierce	243.80	272 330 F
No. Bch. Causeway	Indrio	239.80	272 218 U
Shimoner Ln. ***	Indrio	239.50	272 217 M
Tarmac Road***	Indrio	239.20	272 215 Y
St. Lucie Lane	Indrio	238.80	272 214 S
Chamberlain Blvd.	Indrio	238.40	272 213 K
Milton Road	Indrio	237.80	272 211 W
Torpey Road	Indrio	237.10	272 210 P
Rouse Road	Indrio	236.70	272 209 V
Michigan Street	Indrio	236.10	272 208 N
Wilcox Road	Indrio	235.60	272 207 G
Harbor Branch Rd	Indrio	235.10	272 206 A

\* - Last crossing location (northbound) for proposed Tri-Rail service

\*\* - Recommend to be CLOSED

\*\*\* - Private Crossing

100-foot Non-traversable Medians * (7)			
Street Name	City/Town	Milepost	DOT #
36 <sup>th</sup> Street	West Palm Beach	297.10	272 405 C
45 <sup>th</sup> Street	West Palm Beach	296.65	272 403 N
49 <sup>th</sup> Street	West Palm Beach	296.30	272 240 G
County Line Road	Hobe Sound	280.90	272 372 S
Park Road	Hobe Sound	277.70	272 370 D
SR A1A **	Salerno	268.65	272 360 X
Avenue A	Fort Pierce	241.30	272 238 F

\* **Please note:** if for any reason the Project and the respective municipality cannot agree on the median treatment, then those location(s) be equipped with exit gates.

\*\* Medians to be at least 150-feet each approach due to severe roadway skew.

<b>Three-Quadrant Gates</b> (due to a median present on the opposite side) (6)			
<b>Street Name</b>	<b>City/Town</b>	<b>Milepost</b>	<b>DOT #</b>
Blue Heron Blvd.	Rivera Beach	294.90	272 390 P
Burns Road	Palm Beach Gardens	290.80	272 383 E
Hood Road	Palm Beach Gardens	288.50	272 380 J
Donald Ross Road	Palm Beach Gardens	287.20	272 379 P
Indiantown Road	Jupiter	283.60	272 377 B
Orange Avenue	Fort Pierce	241.50	272 239 M

<b>Private</b> (6 locations within 110 MPH)			
<b>Street Name</b>	<b>City/Town</b>	<b>Milepost</b>	<b>DOT #</b>
Miracle Way *	Rio	257.10	272 341 T
Pitchford Lnd **	Rio	256.20	272 338 K
Shimoner Ln **	Indrio	239.50	272 217 M
Tarmac Road **	Indrio	239.20	272 215 Y
Private Road *	Indrio	234.50	272 205 T
Private Road *	Indrio	233.90	272 204 L

- \* - Recommend locked gate with procedures seeking permission from R.R. dispatch to cross.  
 \*\* - Recommend the Project to equip with Four-Quadrant Gates (including VPD)

<b>Closed</b> (17) <i>Please note: Officials from the city or county are not taking a position, one way or the other, at this time.</i>			
<b>Street Name</b>	<b>City/Town</b>	<b>Milepost</b>	<b>DOT #</b>
179 <sup>th</sup> Street	Aventura	353.60	272 602 R
141 <sup>st</sup> Street *	North Miami Beach	356.12	272 609 N
Third Street	Hallandale	350.30	272 591 F
Monroe Street	Hollywood	349.03	272 588 X
Fillmore Street	Hollywood	348.52	272 585 C
Garfield Street	Hollywood	348.07	272 582 G
Dania Blvd *	Dania Beach	345.94	272 574 P
First Street *	Dania Beach	345.81	272 573 H
22 <sup>nd</sup> Street	Fort Lauderdale	342.96	272 566 X
9 <sup>th</sup> Street	Fort Lauderdale	341.80	272 661 N
6 <sup>th</sup> Street *	Fort Lauderdale	341.56	272 559 M
5 <sup>th</sup> Street *	Fort Lauderdale	341.45	272 558 F
2 <sup>nd</sup> Street	Pompano Beach	333.31	272 534 S
4 <sup>th</sup> Street	Deerfield Beach	327.41	272 513 Y
2 <sup>nd</sup> Street	Deerfield Beach	326.81	272 511 K
Hunter Street	West Palm Beach	303.18	272 450 W
Seaward Street **	Salerno	266.50	272 356 H

- \* - or possible one-way  
 \*\* - only crossing to be closed along 110 MPH segment

## **Conclusion:**

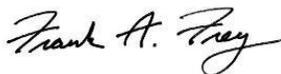
Based upon my professional background and experience in regards to grade crossing safety, I strongly recommend officials from All Aboard Florida to adhere to the principles as outlined in the FRA's guidelines for Emerging High-Speed Rail (80-110 MPH). In doing so incorporates the optimum safety practices in the engineering and design of their crossing locations for the following reasons:

- I. The operating dynamics are significantly changing within the existing environment of the grade crossings, along with an already an active freight operation that will include:
  - The addition of 16 round-trip trains (32 total) at 110 MPH
  - The eventual inclusion of Tri-rail Commuter Rail service, which will add 74 trains.
  - Changing from single track to multiple track configurations.
- II. Densely settled neighborhoods with congested roadways
- III. As many as 5 traffic lanes in the oncoming direction at T-intersections

In summary, as the travelling public begins to assimilate to a substantial increase in railroad operations – by incorporating enhanced railroad signaling technology and increased active highway warning devices are paramount to ensuring safety awareness as both entities interact with one another. Therefore, equipping crossing locations with the recommended actions, as outlined above in this report, will dramatically reduce potential safety hazards and catastrophic events.

## **Report Respectfully Submitted By:**

**Frank A. Frey, Gen. Engineer-HSR**  
Federal Railroad Administration | U.S. DOT  
1200 New Jersey Avenue, SE  
RRS-23 | W33-447  
Washington, DC 20590  
(202) 493-0130  
iPhone (202) 738-2195  
frank.frey@dot.gov



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