Board of County Commissioners
Public Works Department

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June 4, 2019

VIA EMAIL

Gerard O'Rourke
Freight, Logistics and Passenger Operations Administrator
Florida Department of Transportation

RE: FDOT – Indian River County Field Reviews of All Aboard Florida Crossing Plans
Review Comments for Released for Construction – R.M.W. 02-13-19

Mr. O'Rourke,

On May 1st and May 2nd 2019, James Ennis. P.E., Assistant Public Works Director, Janie Hollingsworth, P.E., Traffic Engineer, and I met with several representatives from FDOT to conduct field reviews at each of the 32 highway-rail grade crossings located in the County. Rickey Fitzgerald, FDOT's Freight and Multimodal Operations Manager, stated in the meeting prior to the individual site visits that the primary objective of the meeting and on-site reviews was to identify concerns, enhance standards/guidance, build consistency with plans and build a stronger partnership. It should be noted that Mr. Fitzgerald did not attend the individual site visits due to other commitments.

The site visits went well as FDOT staff acknowledged that the All Aboard Florida (Virgin Trains) Released for Construction Plans, dated February 13, 2019, showed a lack of detail for pedestrian crossings, conflicting design information between plan sheets, disregard for public safety, and a general lack of consistency throughout the plans. However, as of the date of this letter, we have not received any feedback from FDOT regarding the site visit and the plan inconsistencies.

Please be aware that on April 30, 2019, via email, Indian River County received plans from the Florida Department of Transportation (FDOT) labeled AAF Released For Construction – R.M.W., 02-13-19. These Approved for Construction Plans were never provided to Indian River County by Virgin Trains or All Aboard Florida representative. Various County Departments have completed a preliminary review of the submitted plans and their comments are attached in Exhibit A.

This letter is not intended to convey the County's final position for the various safety measures, equipment and/or standards nor the County's commitment to fund any infrastructure improvements and/or associated maintenance costs for the AAF project. Nor is it intended to provide a comprehensive plan review of the design documents provided to the County on April 30th, 2019. It is intended to provide a summary of the major deficiencies or concerns identified based on the current and previous plan reviews and/or lack of information provided to the Indian River County Public Works Department to date.

Based on the plan review and field reviews conducted, the following highlights the main design elements needing resolution and coordination with, Virgin Trains (formally known as All Aboard Florida (AAF)) and Florida East Coast Railway (FEC) for enhanced operation and safety of the rail corridor:

1. **Previous Plan Review Comment Resolution:** After conducting a review of the Released for Construction plans, many of the previous comments provided to AAF (August 15th, 2016 and October 10, 2018) have not been addressed nor has the County received a response, resolution, or any acknowledgement that the comments were reviewed.

2. **Design Plan Conflicts:** The Released for Construction Plans have numerous design conflicts within the various volume submittals and must be revised to avoid confusion and misplacement of warning devices. For example, the Roadway Plans will show a median and three gates, whereas, the Crossing Plans will show 4-Quad gates.

3. **Traffic Congestion Mitigation:** Railroad warning times are anticipated to exceed 90 seconds to several minutes at the highway-rail grade crossings throughout the County due to the higher speed rail train control system which stops or slows approaching trains when a stopped vehicle is detected on the railroad tracks. This will result in multiple crossings being closed at the same time for several minutes, resulting in traffic delays along the rail corridor. Additional traffic mitigation techniques are necessary to minimize delay to drivers, pedestrians and emergency response; however, these require close coordination between the railroad design engineers and the agency controlling the signals (IRC) in order to minimize impacts to traffic and emergency response times.

4. **Railroad Preemption of Traffic Signals:** Traffic signals in close proximity to tracks must be interconnected to the railroad warning system. Railroad preemption is special mode in a traffic signal controller designed to help clear vehicular traffic on the roadway that may be stopped on the tracks, as well as, prohibit conflicting traffic movements with an approaching train. In order to calculate the amount of preemption time needed for the crossing, the railroad must provide specific measurements and railroad design times. At a minimum, additional circuits should be included in the design which includes Supervised, Advance/Simultaneous Preemption, Traffic Signal Health and Gate Down. A Railroad Preemption Relay panel shall be provided that includes a test switch capability. To date these items have not been provided nor has the railroad designer reached out to coordinate the system requirements with the County.

5. **Second Train Logic at Railroad Preempted Crossings:** Where there is more than one track, a second train can approach at any time. If there is an advanced preemption interconnection between the traffic signals and the railroad, the appearance of a second train can hold the traffic signals in preemption and have the gates rise momentarily allowing vehicles to pull up and stop on the tracks while a second train is approaching. When this occurs, the vehicles stopped on the track will not receive a Track Clearance Green light indication to be able to clear the track prior to the second train approaching. Where second train logic is employed, if a second train is detected on the outer approach, the gates will continue to remain down until after the second train passes. Second train logic may be employed where no traffic signals are present if circumstances warrant. This helps prevent traffic from re-queuing onto the track while a second train is approaching. Furthermore, it is an American Railway Engineering and Maintenance-of-Way Association (AREMA) requirement. Based on our plan review it is not apparent if this technology is intended to be deployed.

6. **Left Turning Traffic Queues Blocking Tracks:** There are numerous adjacent roadways and driveways located less than 100 feet of the crossing. After a train event, drivers proceed across the track and a vehicle waiting to turn left at the adjacent driveway or roadway will block the

through traffic lane. This will result in vehicles queueing behind the turning vehicle inadvertently stopping drivers on the tracks. Due to the potential of a second train event, a by-pass lane or a left turn lane should be installed to prevent traffic queues from extending and stopping onto the track while a train is approaching.

7. **Train Speed Variability:** Due to the potential train speed variability along the corridor, it is important to understand the railroad design and the impacts of a slowing or accelerating train and the warning time impacts (i.e. the amount of time the gates will be horizontal). The amount of time the gates are horizontal blocking traffic could be significantly greater as a train decelerates, which will negatively impact vehicular movement resulting in increased delays and congestion. This information has not been provided to the County to date.

8. **Pedestrian Safety:** Due to the train speed and potential for extended warning times, additional measures should be considered at the pedestrian crossings to improve safety.

    a. **Pedestrian Gate Arms and Fencing:** For all pedestrian crossings with a sidewalk, pedestrian gate arms should be provided. A separate gate mechanism for sidewalks should be provided to prevent a pedestrian from raising the vehicular gate at a highway-rail grade crossing. Channelization such as fencing should also be considered. Additional fencing should be considered along the railroad right-of-way to prevent pedestrians from crossing tracks outside of sidewalk area.

    b. **Pedestrian Swing Gate/ Emergency Exit Path:** Due to the multiple tracks and length of the pedestrian crossing, pedestrians will have to cross a greater distance and may not be able to cross the entire distance before the gates are lowered, especially those that are mobility challenged. Swing gates/emergency exit path should be installed where pedestrian gate arms are installed. The swing gates are not electrically connected into approaching train or vehicular traffic signal systems. The purpose of the swing gates is to afford an opportunity to people that are trapped in between the gates the ability to exit the crossing area. The swing gates and access pathways to the gates shall be ADA compliant to allow pedestrians or persons in wheel chairs to exit the crossing by pushing the gate.

    c. **"Second Train Coming" Warning Sign:** Due to the potential of a second train event shortly after the first train clears the crossing, pedestrians may not be aware of another train coming. After waiting several minutes for the passing train, pedestrians may try to cross the tracks since they are not aware of an approaching higher speed train. "Second Train Coming" Warning Signs along with the associated controller equipment should be considered at pedestrian crossings.

9. **Roadway Grade and Grade Transitions:** The proposed plans have numerous locations where the design of the Grade and Grade Transition does not meet American Association of Highway Transportation Officials (AASHTO) guidelines and FDOT standards. Revision of the roadway plans are required.

10. **Highway-rail crossing surfaces:** Crossing surface panels must be at least one foot wider than the sidewalk or edge of roadway, if there is no sidewalk. The current plans do not extend across the entire traffic lane width or sidewalk area. This is not a good design practice and will result in inadequate flange distance for bicycle and wheelchair accessibility, potential off-sets of roadway surface, unexpected roadway edge drop-offs, and lack of a smooth surface.

11. **Construction Road Closures:** Due to the change in railroad grade and the railroad slope requirements, more than one crossing (potentially 3 to 5 crossings) will have to be closed consecutively for construction. AAF plans state only one crossing will be closed at a time in the

City of Vero Beach, which will not be feasible if one track has to remain operational. The closure of multiple thoroughfares at a given time will result in excessive traffic delays. A proposed construction schedule and details should be provided and additional coordination with the County must be conducted to minimize traffic congestion and impacts to local residents and businesses.

12. **Education and Enforcement:** Providing education and enforcement improves safety for both pedestrians and drivers. A comprehensive plan should be developed in conjunction with Operation Life Saver to help promote safer crossings and give more knowledge to our citizens.

The Indian River County Board of County Commissioners and County staff are committed to ensuring that all available safety measures are in place for the operation of the higher speed rail corridor through the County. County staff will continue to demand a design that will have long-lasting protections for our community. We are hopeful that representatives from FDOT and Virgin Trains will reach out to County staff to schedule a design resolution meeting for the protection of the residents of Indian River County. Additionally, the County is asking that FDOT incorporate these comments and any other safety improvements needed during the FDOT review of the construction plans to ensure that the crossings are as safe as possible for the residents of Indian River County and comply with the "Vision Zero Florida" program started by the Department.

Regards,

Richard B. Szpyrka, P.E.
Public Works Director

Attachments:
Indian River County Comments

cc: Kevin Thibault, Secretary of the Florida Department of Transportation
Birgit Olkuch, P.E. – Rail Administration Manager (via email)
Janie Hollingsworth, P.E. – County Traffic Engineer (via email)
Frank Frey – Federal Railroad Administration (via email)

Indian River County
Plan review comments for RFC - RMW, 02-13-2019

Comment #	Volume	Sheet #	Type of Comment	DOT #	Mile Post	Street Name	Comment
1	ALL	General Comment					Please provide a formal response letter addressing comments provided by County Staff to AAF (Adrian Share, Executive Vice President, Rail Infrastructure) on August 15, 2016 and October 10, 2018.
2	ALL	General Comment	Plan Conflicts	All		All	There are numerous plans that conflict showing different railroad warning device placement. For example, Roadway Plans show 3 gates and the Crossing Plans show 4 gates at a crossing. Revise plan sets accordingly.
3	ALL	General Comment	Warning System	All		All	Provide to the county the proposed Railroad Warning Times for each crossing, including Equipment Response Time, Buffer Time, Clearance Time, Minimum Warning Time, and any Exit Gate Delay Time. The timing is required to compute Railroad Preemption calculations for the traffic signals.
4	ALL	General Comment	Warning System	All		All	When possible, eliminate "humps" at crossings. Grade should be less than 1.2% where practical. If grade cannot be met, provide adequate Warning Time/Clearance Time for grade. Provide calculations taking into consideration of the Grade. Grade exceeding 1.2% will result in increased time for larger vehicles to traverse crossing. Evaluate all road profiles to determine if "low clearance" signs are needed. All K values shall meet AASHTO design recommendations. Transition distances may need to be increased to meet recommended design values.
5	ALL	General Comment	Warning System	All		All	Provide the gate down time prior to train arrival for each crossing. Also provide vehicle presence detection (VPD) system operation, such as how many seconds must the vehicle be detected after the gates are down before notification is provided to stop or slow the train? Provide specifications and design details for VPD that will be implemented? Is the detection vital and redundant? VPD is critical to the overall safety of the crossing; missed calls or false detections will compromise the safety of the crossing.
6	ALL	General Comment	Warning System	All		All	Will the gate down time prior to train arrival be different for passenger rail verses freight?
7	ALL	General Comment	Warning System	All		All	Will the exit gates fail in the up position? What happens regarding the warning time if an exit gate fails? Will the train be forced to reduce speed, stop or change operating rules? How much additional time (warning time extended) will the gates be horizontal if the exit gates fail or malfunction? What are the anticipated delays and the impacts to traffic at the crossing?
8	ALL	General Comment	Warning System	All		All	Vehicle gates shall not be used to block pedestrian crossings. This is to prevent a pedestrian from lifting the vehicle gate arm that may be trapped between the tracks and the gate as a result of the distance that a pedestrian has to travel to cross tracks and the extended warning time.
9	ALL	General Comment	Pedestrian	All		All	For all pedestrian crossings with a sidewalk, provide pedestrian gate arms, which also includes emergency swing gates or emergency exit path for all pedestrian crossings. A separate gate mechanism for sidewalks should be provided to prevent a pedestrian from raising the vehicular gate at a highway-rail grade crossing. Channelization such as fencing shall be required at each crossing. It is recommended to install a minimum of 20 feet of fencing leading up to the tactile warning treatment. Provide additional fencing along the railroad right-of-way to prevent pedestrians from crossing tracks outside of sidewalk area.

10	Vol 5	General Comment	Pedestrian	All	All	Provide second train warning sign with audible device at pedestrian crossings with two or more tracks to warn pedestrians of a second train event. Since a second train event can occur shortly after the first train clears the crossing, pedestrians may not be able to see or be aware of a higher speed train approaching.
11	ALL	General Comment	Crossing Surface	All	All	Unless noted as a greater width on a specific plan sheet, concrete crossing surface panels must be at a minimum one foot wider than the sidewalk or edge of roadway, if there is no sidewalk. Evaluate all crossings and revise plans accordingly.
12	ALL	General Comment	Pedestrian	All	All	There must be a level turn-around area (for wheel chair users) next to the rail that is five feet by five feet wide on both sides of the track. ADA Accessibility Guidelines (ADAAG) shall be met.
13	ALL	General Comment	Pavement Markings	All	All	Provide six (6) inch wide thermoplastic white edge line / curb line striping through the crossing. Due to the double tracks and wide crossing distance, this will give additional guidance to the driver as they traverse across the track. Furthermore, this will help prevent drivers from mistakenly turn down the track instead of the adjacent parallel road.
14	ALL	General Comment	Pedestrian	All	All	Swing gates shall be installed where pedestrian gate arms are installed. The swing gates are not electrically connected into approaching train or vehicular traffic signal systems. The purpose of the swing gates is to allow people to reach the clear point on the far side of the automatic gate arm. This happens when a pedestrian is already on the crossing at the same time the automatic gate begins lowers due to approaching train and the pedestrian is unable to walk the entire crossing distance before the gates are lowered. Essentially the pedestrian is trapped between the gate and the track. The swing gates shall be ADA compliant to allow pedestrians or persons in wheelchairs to exit the crossing area by pushing the gate.
15	Vol 5	General Comment	Railroad Preemption	ll Railroad Preempted Crossings	All Railroad Preempted Crossings	At a minimum, provide the following railroad preemption circuits: Advance Preemption Supervised (Double-Break or Single-Break) Warning light and gate activation (XR) Traffic Signal Health Gate Down
16	Vol 5	General Comment	Railroad Preemption	ll Railroad Preempted Crossings	All Railroad Preempted Crossings	Eliminate yellow trap during railroad preemption sequence by implementing flashing yellow arrow or alternate measure approved County. Coordinate with the County on the traffic signal changes.
17	Vol 5	General Comment	Railroad Preemption	ll Railroad Preempted Crossings	All Railroad Preempted Crossings	Close coordination with the railroad system design and traffic signal operation must occur to improve safety and operation. Additional traffic control indications and detection may be required to assist with keeping the track clear and also minimize the traffic congestion. As an example, additional vehicle detection may be needed to assist with clearing traffic congestion as a result of the long warning times contributed by the Higher Speed Rail operation. Furthermore, flashing yellow arrow will be required to eliminate yellow trap condition during railroad preemption. Schedule a design review meetig with the County to review traffic signal preemption operation and traffic signal design.
18	Vol 5	General Comment	Railroad Preemption	ll Railroad Preempted Crossings	All Railroad Preempted Crossings	Provide Railroad Preemption Interface relay panel for all railroad preempted traffic signals. Test switch must be included.

19	Vol 5	General Comment	Railroad Preemption	ll Railroad Preempted Crossings	All Railroad Preempted Crossings	At a minimum, a 7 conductor preemption cable shall be provided. Additional conductors may be required pending number of circuits needed. Please coordinate with County on traffic signal design.
20	ALL	General Comment	Railroad Warning System	All	All	Provide Second Train Logic at railroad preempted crossings and at crossings that have a storage area less than 100 feet. Where there is more than one track, a second train can approach at any time. If there is an advanced preemption interconnection between the traffic signals and the railroad, the appearance of a second train can hold the traffic signals in preemption and have the gates rise momentarily allowing vehicles to pull up on to the tracks. Where second train logic is employed, if a second train is detected on the outer approach, the gates will remain down until after the second train passes.
21	ALL	General Comment	Pedestrian	All	All	Flangeway gaps at pedestrian at-grade rail crossings shall be 2.5 inch maximum on non-freight rail track and 3 inch maximum on freight rail track.
22	ALL	General Comment	Quiet Zone	All	All	Ensure all equipment and placement of devices will meet FRA Quiet Zone requirements for the County to obtain Quiet Zone approval without additional costs.
23	ALL	General Comment	Fencing			Show all fencing locations. Fencing shall be placed a minimum of 1 foot inside the Railroad ROW (Exception will be on sidewalks where fencing may be required outside the ROW). Fencing should be placed near pedestrian traffic generators in urban areas and select rural areas, such as walk to school routes and parks, as well as locations of pedestrian trespass and subdivisions. Submit fencing details. County requests diagnostic meeting with knowledgeable representatives from Railroad companies, FRA, City and County to determine fencing locations.
24	Vol 3	General Comment	Road Closure Plans	All	All	Road Closed to Thru Traffic (R11-4) sign shall be installed on a Type III barricade. Road Closed Ahead warning sign with supplemental plaque is not sufficient.
25	Vol 3	General Comment	Road Closure Plans	All	All	All road closures provided in the Roadway Plans are insufficient and lack adequate details. Contractor is responsible for submitting road closure plans (Temporary Traffic Control Plans) in compliance with FDOT and MUTCD standards. Please note all road closure plans as not approved. Contractor to submit revised closure plans that meet standards.
26	Vol 4	General Comment	Pavement Markings	All	All	Show all existing and proposed pavement markings relating to Railroad and roadway approach on plans. All railroad pavement marking placement must meet current standards for placement. Any relocation of an existing pavement message to meet standards will require mill and resurfacing prior to relocation.
27	Vol 4	General Comment	Signs	All	All	Show all existing and proposed signs relating to Railroad on plans. All existing and proposed signs must meet current MUTCD and FDOT standards for placement and retroreflectivity. Any signs not meeting current standards shall be replaced.
28		General Comment	Emergency Access	All	All	Due to locations of hospital, emergency response may be delayed as result of the warning times for each crossing. What measures have been taken to ensure emergency response times are not impacted?
29	Vol 3	General Comment	ADA			Provide detail for detectable warning surface (truncated domes). Detectable warning surface shall be provided at pedestrian crossings. Truncated domes shall be full width of sidewalk.

30	ALL	General Comment	Railroad Preemption	ll Railroad Preempted Crossings	All Railroad Preempted Crossings	Provide the measurement of the Minimum Track Clearance Distance (MTCD) at each railroad preempted crossing in order for preemption calculations to be completed.
31	Vol 4	General Comment	Signs	All	All	Install "TRAINS MAY EXCEED 80 MPH" signs (W10-8) for all crossings where train speeds will exceed 80 MPH.
32	Vol 4	General Comment	Signs	All	All	Add "DO NOT STOP ON TRACKS" R8-8 (24"x30") signs on the far side of the tracks for each approach for all crossings
33	Vol 5	General Comment	Signs	As specified	As specified	Upgrade all existing and proposed turn prohibition signs blank-out signs during railroad preemption to LED and include "TRAIN".
34	Vol 5	General Comment	Signs	As specified	As specified	Show all turn prohibitions in railroad preemption phasing diagrams.
35	Vol 3	4	General Notes			Note #18 - Remove Donte Taylor as the contact. He no longer works for the County. Change number to 772-226-1547
36	Vol 3	4	General Notes			Note #16 states that only one crossing can be closed at any time in the City of Vero Beach. Due to the change in railroad grade and the slope requirements, it appears that more than one crossing will have to be closed for construction. Provide closure details and schedule to minimize traffic impacts.
37	Vol 3	7	Roadway Details			Standard detail shows 0'-2' widening. The minimum widening shall be 2'. Adjust standard note accordingly.
38	Vol 3	7	Roadway Details			Add a note under Sidewalk Detail: A minimum of 5 feet of surface perpendicular to the track must be provided for skewed crossings permit wheelchair to cross perpendicular to the track.
39	Vol 3	166	Plan Conflicts	272159U	212.57 Roseland Road	Verify placement of pedestrian gate location. Gate is located over 20 feet from center of crossing. Will the extra distance require additional warning time for the pedestrian to clear the crossing? The pedestrian gate placement in Vol 3 does not match Vol 6.
40	Vol 3	168	Construction	272159U	212.57 Roseland Road	Recommend additional overhead lighting at flagger stations due to 24 hour operation.
41	Vol 4	54	Roadway	272159U	212.57 Roseland Road	After a train event, northeastbound traffic queues extending across from the entrance to the post office. Due to a potential of a second train event and traffic queues extending across the track, a by-pass lane or a left turn lane shall be installed for northeastbound traffic turning into the post office.
42	Vol 6	55	Plan Conflicts	272159U	212.57 Roseland Road	Crossing plan conflicts with Vol 3 and 4. Vol 6 doesn't show exit gates. Vol 3 & 4 shows exit gates. Resolve accordingly.
43	Vol 3	166	Roadway	272159U	212.57 Roseland Road	Extend track panels a minimum of 5 foot beyond the edge of travel way and 1 foot for the edge of sidewalk. 5 Foot Shoulder must be provided.
44	Vol 3	167	Roadway	272159U	212.57 Roseland Road	Provide roadway transition on both sides of the track to remove "hump" condition.
45	Vol 3	169	Plan Conflicts	272161V	214.42 Main Street	Vol 3 plans 3 Quad Gates. Vol 6 shows 4-Quad Gates. Plans are in conflict and should be revised accordingly.
46	Vol 3	169	Roadway	272161V	214.42 Main Street	Extend track panels a minimum of 5 foot beyond the edge of travel way and 1 foot for the edge of sidewalk. 5 foot shoulder must be provided
47	Vol 3	169	Pedestrian	272161V	214.42 Main Street	Due to skewed crossing, verify that a minimum of 5 feet of sidewalk crosses perpendicular to the track for wheelchair access.
48	Vol 3	169	Left Turns	272161V	214.42 Main Street	Provide westbound left turn lane at Louisiana. Due to multiple train events, queues resulting from the left turning vehicle will extend across crossing.
49	Vol 6	56	Sight Distance	272161V	214.42 Main Street	Verify adequate sight distance is provided for southbound Louisiana Ave due to the revised Railroad house location.

50	Vol 3	169	Roadway	272161V	214.42 Main Street	Provide roadway transition on both sides of the track to remove "hump" condition.
51	Vol 4	55	Signs	272161V	214.42 Main Street	Install Intersection Warning Signs (W10-2) for northbound and southbound Louisiana
52	Vol 3	171	Construction	272161V	214.42 Main Street	Road Closed to Thru Traffic (R11-4) sign shall be installed on a Type III barricade for Main St at US 1 and Powerline Rd.
53	Vol 6	57	Drainage	272063H	214.7 CR 512 West/Sebastian	Verify placement of railroad house. Appears there may be a drainage conflict.
54	Vol 6	57	Warning System	272063H	214.7 CR 512 West/Sebastian	Can the gates be moved closer to crossing? Plan is proposing 27' 5" to 38' 4" away from tracks. Concern with a vehicle stopped in between the tracks and gate during a train event. Furthermore, the width of the Minimum Track Clearance Distance will require additional Clearance Time.
55	Vol 6	57	Warning System	272063H	214.7 CR 512 West/Sebastian	Ped gate is located over 20 feet from centerline of crossing. Verify adequate clearance time is provided for the additional distance to cross tracks. Can the gate be relocated to reduce crossing distance?
56	Vol 3	172	Warning System	272063H	214.7 CR 512 West/Sebastian	Due to skewed crossing, verify that a minimum of 5 feet of sidewalk crosses perpendicular to the track for wheelchair access.
57	Vol 4	56	Signs	272063H	214.7 CR 512 West/Sebastian	Add "DO NOT STOP ON TRACKS" R8-8 (24"x30") signs on the far side of the tracks. Sign shall be placed on north and south curb line.
58	Vol 4	56	Signs	272063H	214.7 CR 512 West/Sebastian	Extend bike lane through crossing.
59	Vol 3	172	Warning System	272063H	214.7 CR 512 West/Sebastian	Provide pedestrian gate arms, which also includes emergency swing gates or emergency exit path. A separate gate mechanism for sidewalks should be provided to prevent a pedestrian from raising the vehicular gate at a highway-rail grade crossing. Channelization such as fencing shall be required at each crossing. It is recommended to install a minimum of 20 feet of fencing leading up to the tactile warning treatment. Provide additional fencing along the railroad right-of-way to prevent pedestrians from crossing tracks outside of sidewalk area.
60	Vol 4	56	Pavement Markings	272063H	214.7 CR 512 West/Sebastian	Extend lane lines through the crossing due the curve and gate placement.
61	Vol 3	172	ADA	272063H	214.7 CR 512 West/Sebastian	Provide detectable warning surface (truncated domes) for each approach to comply with ADAAG.
62	Vol 3	174	Construction	272063H	214.7 CR 512 West/Sebastian	Road Closure plan is unacceptable. Due to one way operation, plans must be provided to show how access to private businesses will be handled. A more detail plan must be provided on how the business access will be resolved. Left turn and right turn lanes shall be closed on US 1 turning towards track. Detour signs/Route for southbound US 1 shall be provide for the traffic that are prohibited from turning right.
63	Vol 4	57	Pavement Markings	272162C	215.06 CR 512 East/ Sebastian Blvd	Remove pavement arrows prior to track. Due to the double track and widened crossing, pavement arrows may cause driver confusion and result in a motorist turning down the track.
64	Vol 4	57	Signs	272162C	215.06 CR 512 East/ Sebastian Blvd	Install Intersection Warning Signs (W10-2) for Old Dixie Hwy
65	Vol 4	57	Pavement Markings	272162C	215.06 CR 512 East/ Sebastian Blvd	Extend 5 foot bike lane through crossing.

66	Vol 3	175	Warning System	272162C	215.06	CR 512 East/ Sebastian Blvd	Provide pedestrian gate arms, which also includes emergency swing gates or emergency exit path. A separate gate mechanism for sidewalks should be provided to prevent a pedestrian from raising the vehicular gate at a highway-rail grade crossing. Channelization such as fencing shall be required at each crossing. It is recommended to install a minimum of 20 feet of fencing leading up to the tactile warning treatment. Provide additional fencing along the railroad right-of-way to prevent pedestrians from crossing tracks outside of sidewalk area.
67	Vol 3	177	Construction	272162C	215.06	CR 512 East/ Sebastian Blvd	Road Closure plan is unacceptable. Due to one way operation, lane closures will be required. A more detail plan must be provided on how the business access will be resolved. Turn restriction signs are required.
68	Vol 3	177	Roadway	272162C	215.06	CR 512 East/ Sebastian Blvd	Provide roadway transition on both sides of the track to remove "hump" condition.
69	Vol 3	177	Drainage	272162C	215.06	CR 512 East/ Sebastian Blvd	Verify placement of warning devices. Appears to be in conflict with drainage system.
70	Vol 6	59	Warning System	272163J	216	Old Dixie Hwy	Verify adequate sight distance is provided to see railroad flashing light display due to curve in roadway. Adjust warning devices as needed.
71	Vol 3	179	Roadway	272163J	216	Old Dixie Hwy	Provide K value calculations and show that it meets AASHTO. Extend transitions to provide an acceptable K value for sight distance and vehicle clearance.
72	Vol 4	58	Pavement Markings	272163J	216	Old Dixie Hwy	Provide white edge line and double-yellow center line through the crossing due to curve.
73	Vol 6	60	Warning System	272164R	216.59	Schumann Dr	Pedestrian gate required for sidewalk. Sidewalk is not shown on this plan set. See General note regarding pedestrian gates and swing gate/ emergency exit path.
74	Vol 4	59	Signs	272164R	216.59	Schumann Dr	Install Intersection Warning Signs (W10-2) for Essex Ln
75	Vol 4	59	Roadway	272164R	216.59	Schumann Dr	Provide westbound left turn lane at Essex Ln. Due to multiple train events, queues resulting from the left turning vehicle will extend across crossing.
76	Vol 3	184	Roadway	272165X	217.61	99th St/Vickers Rd	Provide westbound left turn lane or create by-pass lane at driveway located west of the crossing. Due to multiple train events, queues resulting from the left turning vehicle will extend across crossing. Note that trucks towing large boats turn left into driveway for boat storage.
77	Vol 3	186	Roadway	272165X	217.61	99th St/Vickers Rd	Provide a minimum of 2 foot shoulder for construction by-pass lane. The plans show only a 10 ft. traffic lane without a shoulder. This appears to be too narrow. Verify turning template for a large truck towing boat to ensure driver can maneuver the narrow traffic lane.
78	Vol 6	62	Sight Distance	272974H	218.05	Barber St	Evaluate eastbound flashing light display to ensure sight visibility. Trees may block flashing light display.
79	Vol 4	61	Signs	272974H	218.05	Barber St	Add one way signs for Eagles Lodge driveway. Driveway is one way southbound. Add No Right Turn (symbol) sign just east of the driveway. This is to prevent traffic queues from extending onto track.
80	Vol 6	62	Plan Conflicts	272974H	218.05	Barber St	Railroad warning devices do not match in Vol 3 and 4. Vol 3 & 4 Show ped gate at exit gates. Revise plans accordingly. See general notes regarding pedestrian gates and swing gates/emergency exit path.
81	Vol 6	63	Plan Conflicts	272168T	219.58	CR 510/ Wabasso Rd	Railroad warning devices do not match in Vol 3 and 4. Vol 3 & 4 Show ped gate at exit gates. Revise plans accordingly. See general notes regarding pedestrian gates and swing gates/emergency exit path.
82	Vol 6	63	Warning System	272168T	219.58	CR 510/ Wabasso Rd	FDOT has plans to widen CR 510/Wabasso to 4 lanes (two lanes in each direction). Construct full width.

83	Vol 4	62	Signs	272168T	219.58	CR 510/ Wabasso Rd	"DO NOT STOP ON TRACKS" sign is located in the middle of the sidewalk. Relocate to appropriate location.
84	Vol 4	62	Pavement Markings	272168T	219.58	CR 510/ Wabasso Rd	Show the proposed W10-1 and railroad crossing pavement markings.
85	Vol 3	193	Pedestrian	272170U	220.7	77th Street/Hobart Road	Extend sidewalk through crossing on Southside to match existing sidewalk. Revise warning devices accordingly. See General note regarding pedestrian gates and swing gates/emergency path.
86	Vol 6	63	Signs	272170U	220.7	77th Street/Hobart Road	Due to the added track and reduced clear storage distance, the stop sign for eastbound 77th St at Old Dixie needs to be evaluated. Coordinate with the County on the determining the appropriate traffic control measures to prevent queuing onto the track.
87	Vol 3	193	Roadway	272170U	220.7	77th Street/Hobart Road	Provide westbound left turn lane or create by-pass lane at driveway located west of the crossing. Due to multiple train events, queues resulting from the left turning vehicle will extend across crossing. Note that tractor trailers access driveway to warehouse..
88	Vol 3	194	Roadway	272170U	220.7	77th Street/Hobart Road	Extend roadway grade transition to reduce grade approaching track.
89	Vol 4	64	Signs	272172H	221.8	69th St/ N Winder Beach Rd	Install Intersection Warning Signs (W10-2) for Old Dixie Hwy
90	Vol 3	196	Roadway	272172H	221.8	69th St/ N Winder Beach Rd	Extend bike lane through crossing. Widening of roadway is required.
91	Vol 3	196	Roadway	272172H	221.8	69th St/ N Winder Beach Rd	Extend sidewalk through crossing on Southside to match existing sidewalk. Revise warning devices accordingly. See General note regarding pedestrian gates and swing gates/emergency path.
92	Vol 3	196	Red Flashing Beacon	272172H	221.8	69th St/ N Winder Beach Rd	Evaluate the flashing red beacon at the intersection of 69th St and Old Dixie Hwy. Due to the close proximity of the flashing light and the railroad warning lights, the flashing red light should be removed and alternate traffic control device or placement should be considered. Close coordination with County is required to determine the appropriate device for the intersection.
93	Vol 3	196	Roadway	272172H	221.8	69th St/ N Winder Beach Rd	69th St is a truck route and hauling route for local concrete plant. Evaluate the grade of the crossing profile and increase grade transition to ensure adequate crossing clearance for low clearance vehicles.
94	Vol 3	196	Roadway	272172H	221.8	69th St/ N Winder Beach Rd	Evaluate the Clear Storage Distance - the storage area between the track and Old Dixie. Due to the tractor trailers using this route, changes to the intersection operation may need to be considered as a result of tractor trailer extending into the Minimum Track Clearance Distance (MTCD). Please coordinate with the County.
95	Vol 4	65	signs	272173P	222.32	65th St/ S Winter Beach Rd	Install Intersection Warning Signs (W10-2) for Old Dixie Hwy
96	Vol 3	199	Red Flashing Beacon	272173P	222.32	65th St/ S Winter Beach Rd	Evaluate the flashing red beacon at the intersection of 65th St and Old Dixie Hwy. Due to the close proximity of the flashing light and the railroad warning lights, the flashing red light should be removed and alternate traffic control device or placement should be considered. Close coordination with County is required to determine the appropriate device for the intersection.
97	Vol 3	199	Roadway	272173P	222.32	65th St/ S Winter Beach Rd	Widen roadway to eliminate westbound through lane off-set through the intersection. Widen eastbound to a minimum 12 ft. traffic lane over crossing with shoulder. Ensure transition meets FDOT standards.
98	Vol 3	199	Roadway	272173P	222.32	65th St/ S Winter Beach Rd	Evaluate the Clear Storage Distance - the storage area between the track and Old Dixie. Due to the tractor trailers using this route (Recycle Center is located on 65th St), changes to the intersection operation may need to be considered as a result of tractor trailer extending into the Minimum Track Clearance Distance (MTCD). Please coordinate with the County.

99	Vol 3	202	Roadway	272175D	223.18	Hawks Nest Rd	Adequate turnaround area must be provided at the property entrance gate to allow a driver an opportunity to a exit the property if the private property gates are locked in a down position. The proposed median would require a driver conduct a backing maneuver over the tracks, which is unacceptable. Revise median to permit an opening, which would require a railroad exit gate.
100	Vol 4	67	Pavement Markings	273108M	223.9	53rd Street	Remove stop line east of crossing. Stop line forces traffic to stop on the track.
101	Vol 4	67	Pavement Markings	273108M	223.9	53rd Street	Remove left turn arrow located within the MTCD to prevent driver confusion of turning down the track.
102	Vol 5	CL-08068	Traffic Signal	273108M	223.9	53rd Street	Install pre-signal for eastbound traffic. Stop line and far side traffic signal exceeds 200 ft., therefore, requiring the additional traffic signal indications. Coordinate with the County regarding the design and operation of the nearside signals. NO TURN ON RED sign required for presignal.
103	Vol 5	CL-08068	Traffic Signal	273108M	223.9	53rd Street	Install flashing yellow arrow to eliminate yellow trap during railroad preemption.
104	Vol 4	67	Signs	273108M	223.9	53rd Street	Relocate "DO NOT STOP ON TRACKS" sign for eastbound traffic. Warning devices will block view of sign.
105	Vol 5	CL-08068	Traffic Signal	273108M	223.9	53rd Street	Turn prohibition blank-out signs during railroad preemption required for northbound and southbound Old Dixie. Show blank-out sign operation in phasing plan.
106	Vol 4	67	Signs	273108M	223.9	53rd Street	"STOP HERE ON RED" shall be posted in median for eastbound traffic.
107	Vol	205	Pavement Markings	273108M	223.9	53rd Street	Provide bike lane over crossing for eastbound and westbound.
108	Vol 6	68	Plan Conflicts	273108M	223.9	53rd Street	Proposed Railroad House and equipment on southwest corner appears to be located at the same location as the traffic signal mastarm and luminaire pole. Furthermore, the railroad house location is not consistently located in the same place throughout all volumes. Please verify and revise all plan sets accordingly.
109	Vol 4	67	signs	273108M	223.9	53rd Street	Install Intersection Warning Signs (W10-2) for Old Dixie Hwy
110	Vol 4	68	signs	272177S	224.42	49th Street/Lindsey Road	Install Intersection Warning Signs (W10-2) for Old Dixie Hwy
111	Vol 3	208	Warning System	272177S	224.42	49th Street/Lindsey Road	Provide siding track "3rd track" operational details. How often will the siding track be utilized? How will the siding effect nearby crossings when a train decelerates into the siding and when exit the siding? Will stopped trains block 49th St for extended periods of time?
112	Vol 3	209	Warning System	272177S	224.42	49th Street/Lindsey Road	Evaluate crossing grade profile to ensure low clearance vehicles can clear crossing. Trucks towing boats to storage lot and a high volume of tractor trailers traverse crossing.
113	Vol 3	209	Warning System	272177S	224.42	49th Street/Lindsey Road	Widen roadway to include bike lanes.
114	Vol 6	69	Plan Conflicts	272177S	224.42	49th Street/Lindsey Road	Railroad warning devices do not match in Vol 3 and 4. Vol 3 & 4 Show ped gate at exit gates. Revise plans accordingly. See general notes regarding pedestrian gates and swing gates/emergency exit path.
115	Vol 3	211	Warning System	272178Y	224.94	45th Street	Evaluate the flashing red beacon at the intersection of 45th St and Old Dixie Hwy. Due to the close proximity of the flashing light and the railroad warning lights, the flashing red light should be removed and alternate traffic control device or placement should be considered. Close coordination with County is required to determine the appropriate device for the intersection.
116	Vol 3	211	Left Turns	272178Y	224.94	45th Street	Extend 2-way left center turn lane to crossing. Traffic queues extend across the track due to through lane being blocked by downstream left turn.

117	Vol 4	69	signs	272178Y	224.94 45th Street	Install Intersection Warning Signs (W10-2) for Old Dixie Hwy
118	Vol 6	70	Plan Conflicts	272178Y	224.94 45th Street	Railroad warning devices do not match in Vol 3 and 4. Vol 3 & 4 Show ped gate at exit gates. Revise plans accordingly. See general notes regarding pedestrian gates and swing gates/emergency exit path.
119	Vol 4	70	signs	272179F	225.12 43rd Street	Install Intersection Warning Signs (W10-2) for Old Dixie Hwy
120	Vol 6	72	Plan Conflicts	272180A	225.46 41st Street	Railroad warning devices do not match in Vol 3 and 4. Vol 3 & 4 Show ped gate at exit gates. Revise plans accordingly. See general notes regarding pedestrian gates and swing gates/emergency exit path.
121	Vol 3	217	Pedestrian	272180A	225.46 41st Street	Extend sidewalks through crossing. Crossing panels shall be extended.
122	Vol 5		Traffic Signal	272180A	225.46 41st Street	Provide plans for traffic signal. Evaluate the flashing red beacon at the intersection of 41st St and Old Dixie Hwy. Due to the close proximity of the flashing light and the railroad warning lights, the flashing red light should be removed and traffic signal shall be installed. Coordination with County is required to determine the appropriate design for the intersection.
123	Vol 4	71	signs	272180A	225.46 41st Street	Install Intersection Warning Signs (W10-2) for Old Dixie Hwy
124	Vol 5	CL-08-73	Traffic Signal	273047Y	226.65 32nd St/Aviation Blvd	Upgrade existing turn prohibition blank-out signs with "TRAIN" - No left turn and no right turn.
125	Vol 5	CL-08-73	Traffic Signal	273047Y	226.65 32nd St/Aviation Blvd	Install advance vehicle detection approximately 850 feet west of crossing. Advance detection is required to help clear traffic queues after train events. Due increased number of train events and traffic congestion as a result of the higher speed rail, additional right turn lane shall be provided at US 1 for eastbound and southbound. Coordinate with the County to determine additional traffic congestion mitigation measures to be incorporated.
126	Vol 3	220	Pedestrian	273047Y	226.65 32nd St/Aviation Blvd	Provide sidewalk connection on south side of Aviation Blvd to connect to intersection crosswalk.
127	Vol 4	73	signs	272189L	227.06 26th Street	Evaluate roadway profile to determine if low clearance signs are required. Add advance warning signs as needed.
128	Vol 5	CL-08-074	Traffic Signal	272189L	227.06 26th Street	Coordinate with the County, City of Vero Beach and FDOT regarding the traffic signal design and operation. Revisions are required to the proposed traffic signal, sign and pavement marking plan. Relocate traffic signal cabinet to east side of crossing. The current cabinet location malfunctions due to the train vibration.
129	Vol 3	223	Pedestrian	272189L	227.06 26th Street	Additional detectable warning surface (truncated domes) required at pedestrian gate on north side of crossing.
130	Vol 3	227	signs	272190F	227.14 14th Avenue	Evaluate roadway profile to determine if low clearance signs are required. Add advance warning signs as needed.
131	Vol 6	76	Plan Conflicts	272191M	227.31 23rd Street	Railroad warning devices do not match in Vol 3 and 4. Vol 3 & 4 Show ped gate at exit gates. Revise plans accordingly. See general notes regarding pedestrian gates and swing gates/emergency exit path.
132	Vol 5	CL-8-78	Traffic Signal	272958Y	227.55 SR 60 WB 20th St/20th Pl	Install LED no right turn blank-out sign with "Train" sign to be activated during railroad preemption.
133	Vol 6	81	Plan Conflicts	272196W	228.66 12th Street	Railroad warning devices do not match in Vol 3 and 4. Vol 3 & 4 Show ped gate at exit gates. Revise plans accordingly. See general notes regarding pedestrian gates and swing gates/emergency exit path.
134	Vol 3	247	Pedestrian	272197D	229.19 8th St/Glendale Road	Extend sidewalk through crossing on Southside to match existing sidewalk. Revise warning devices accordingly. See General note regarding pedestrian gates and swing gates/emergency path.
135	Vol 5	CL-08-83	Traffic Signal	272198K	229.74 4th Street	Due to limited storage between track and US 1, install LED "NO LEFT TURN TRAIN" prohibition sign for the northbound US 1 left turn lane.

136	Vol 5	CL08-85	Traffic Signal	272200J	230.14	Oslo Road	Traffic queues extend across track on Oslo Road. Additional traffic control measures need to be considered at the crossing to minimize traffic queuing across tracks. Coordinate with the County regarding possible design options to keep track clear.
137	Vol 3	253	Pedestrian	272199S	230.14	1st Street	Install sidewalks on both sides of the crossing. See general notes for pedestrian gates and emergency exit path.
138	Vol 5	General Comment	Traffic Signal			12th Street	Traffic signal preemption is missing for the intersection of 12th St and Commerce Ave. Please include in plans.
139	Vol 7	General Comment	Utilities	All		All	All IRC utilities cross over the fiber optic duct bank. It looks like our maximum depth is 5.5’ whereas the minimum depth of the duct banks is 6.5’. There should not be any conflicts but it would not hurt to look more closely.
140	Vol 7	General Comment	Utilities	All		All	Horizontal Separation 14.06: All water, reclaimed water and/or sewer utilities shall be located a minimum horizontal separation equal to the depth of the pipe plus the diameter of the pipe from any permanent above ground structures (i.e., walls, trees, transformer pads, etc.).
141	Vol 7	General Comment	Utilities	All		All	Horizontal Separation 14.06: A minimum 4-feet separation is required between water/sewer utilities and other underground utilities such as telephone, gas, cable, irrigation, etc.
142	Vol 7	General Comment	Utilities	All		All	Vertical Separation 14.07: Maintain 18” vertical clearance between any water/sewer utility and any other underground utilities such as telephone, gas, cable, irrigation, etc.
143	Vol 7	General Comment	Utilities				Indian River County owns the reuse and brine lines.
144	Vol 7	100	Utilities				Missing 8” water main with 20” casing on sheet 100; see file “Sebastian W”
145	Vol 7	General Comment	Utilities				Missing 6” force main with 16” casing around station 2664+50; see file “Manly S”
146	Vol 7	General Comment	Utilities			87th Street/River Street	Missing 16” water main with 24” casing at 87th St or River Street; see file “87th W”
147	Vol 7	General Comment	Utilities				Missing 24” force main with 38” casing north of Hobart Rd around station 2870; see file “North 77th S”
148	Vol 7	107	Utilities			77th Street/Hobart Road	Incorrect information on sheet: 16” reuse with 32” casing
149	Vol 7	107	Utilities			77th Street/Hobart Road	Incorrect information on sheet: 16” water main with 30” casing
150	Vol 7	108	Utilities			69th Street/N Winter Beach Road	12” water main with 24” casing
151	Vol 7	108	Utilities			69th Street/N Winter Beach Road	6” force main with 14” casing
152	Vol 7	108	Utilities			69th Street/N Winter Beach Road	See file “69th W&S”
153	Vol 7	111	Utilities			57th Street	12” reuse with 24” casing
154	Vol 7	111	Utilities			57th Street	16” brine with 30” casing
155	Vol 7	112	Utilities			53rd Street	16” force main with 24” casing
156	Vol 7	112	Utilities			53rd Street	12” water main with 24” casing
157	Vol 7	114	Utilities			49th Street/Lindsey Road	Incorrect information on sheet: 14” force main with 20” casing
158	Vol 7	114	Utilities			49th Street/Lindsey Road	Incorrect information on sheet: 10” reuse with 30” casing
159	Vol 7	General Comment	Utilities			44th Street	Missing 12” force main with 28” casing along 44th St, about ST 3116; see file “44th S”
160	Vol 7	General Comment	Utilities			12th Street	There may be a 2.5” force main north of 12th St at around ST 3300 but there are no as-builts
161	Vol 7	129	Utilities			12th Street	Incorrect information on sheet: 16” water main with 30” casing
162	Vol 7	General Comment	Utilities			1st Street	Missing 10” force main with 18” casing north of 1st St; see file “2nd S”
163	Vol 7	General Comment	Utilities			21st Street SE	Missing 10” force main with 18” casing at 21st St SE, south of Highland Dr; see file “Highland”