

# Rail Operations & Design of Dynamic Envelopes

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**FDOT D6 Director of Transportation Development**

Existing Rail Providers & Services

Rail Corridors & Owners

Growing Passenger Rail Operations

What is the Railroad Dynamic Envelope (RDE)?

Roadway Design Bulletin 20-02

New Railroad Crossing Configuration

Poll



# Existing Rail Providers & Services

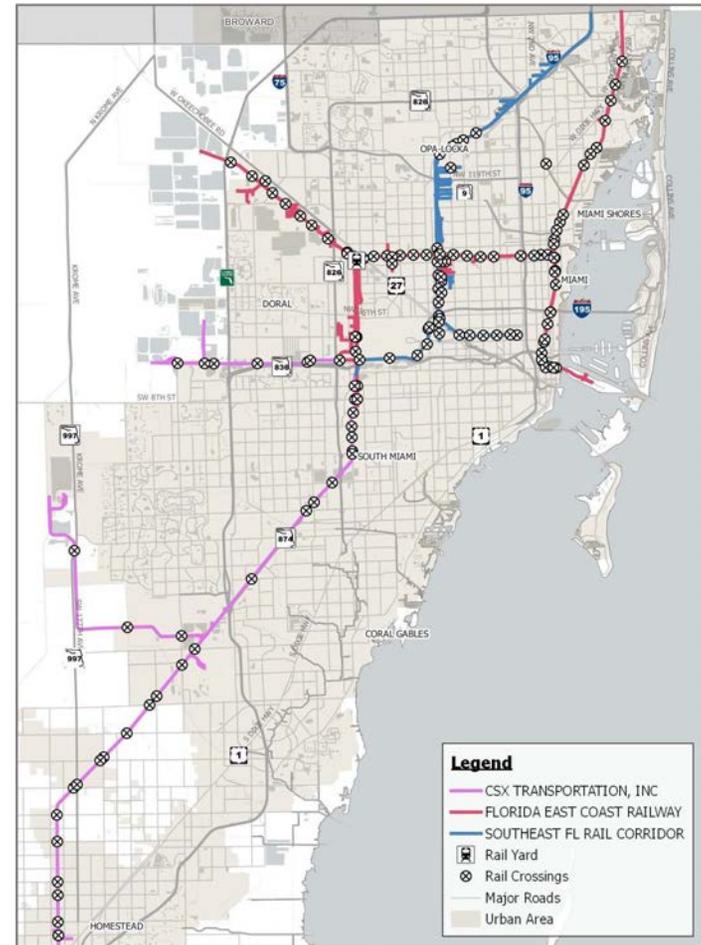
## Passenger Rail Providers



## Freight Rail Providers



FDOT D6 RAIL SAFETY WEEK WEBINAR EVENT



# Rail Corridors & Owners

## Publicly Owned

### Metrorail Alignment

Frequency  
15 minutes

Avg. Speed  
29 mph

Max Speed  
58 mph



### South Florida Rail Corridor

Frequency  
42 - 55  
trains/day

Avg. Speed  
40-45 mph

Max Speed  
45 mph



## Privately Owned

### Freight Corridors

Frequency  
2 trains/day

Avg. Speed  
10-25 mph

Max Speed  
25 mph



### Mainline

#### PASSENGER & FREIGHT

Frequency  
50 trains/day

Avg. Speed  
60-79 mph

Max Speed  
79 mph



#### FREIGHT CORRIDORS

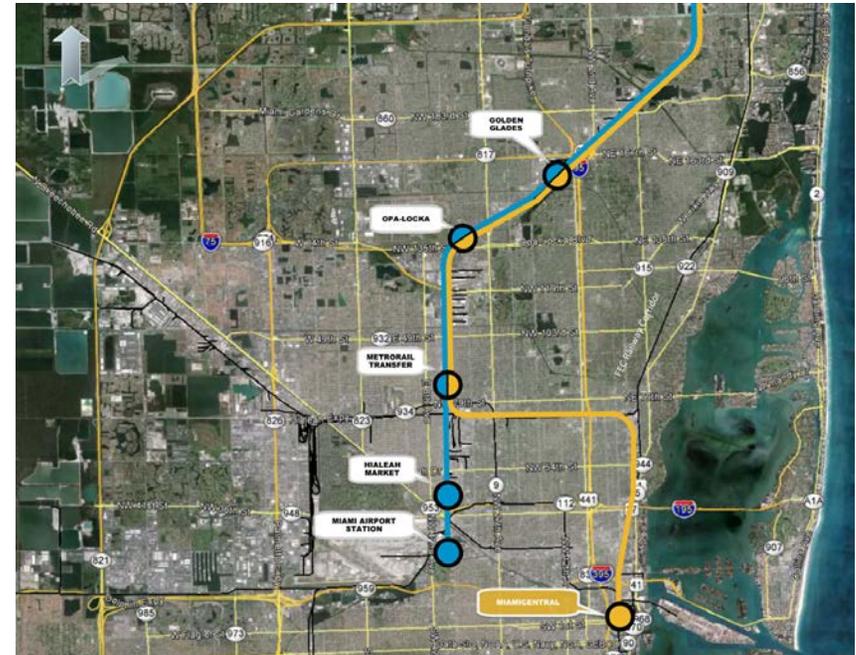
Frequency  
18 trains/day

Avg. Speed  
20-30 mph

Max Speed  
30 mph

# Growing Passenger Rail Operations

## Tri-Rail Downtown Miami Link Service



# Growing Passenger Rail Operations

## Tri-Rail Coastal Link



**Tri-Rail Coastal Link – Commuter Rail**

- **Commuter Passenger Rail**  
- 25+ round-trip trains per day
- **Commuters and Local Travelers**
- **85 miles from Miami to Jupiter**
- **Phased Implementation**
- **20 to 25 stations**
- **Integrated with Tri-Rail**
- **Funding programmed for Project Development phase**

**Brightline – Intercity Passenger Rail**

- **Intercity Passenger Rail**  
- up to 16 round-trip trains per day
- **Tourists and Regional Travelers**
- **240 miles from Miami to Orlando**
- **Phase 1: Miami to WPB**
- **3 Stations in Tri-County area**
- **Privately funded**

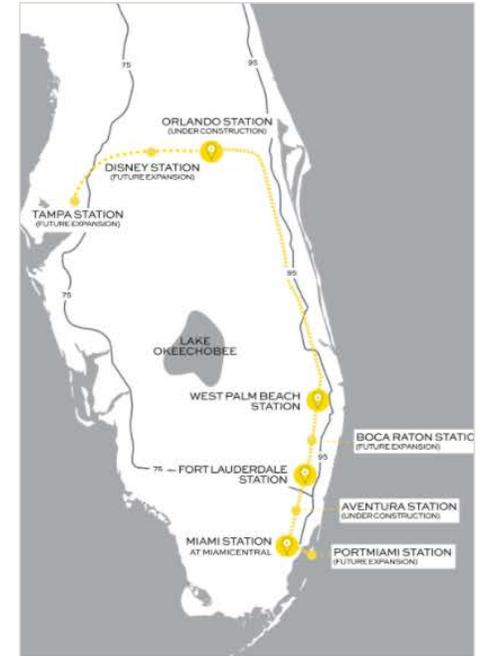
**KEY**

- Tri-Rail Coastal Link Blue Line
- Tri-Rail Coastal Link Red Line
- Tri-Rail Coastal Link Green Line
- Existing Station
- Proposed Station
- Proposed All Aboard Florida Station
- Maintenance and Depot Facility
- Airport
- Support
- Metrorail Green Line
- Metrorail Orange Line
- Connections

Note: Proposed station locations are identified for further study but subject to change.

# Growing Passenger Rail Operations

## Brightline Expansion & Aventura Station

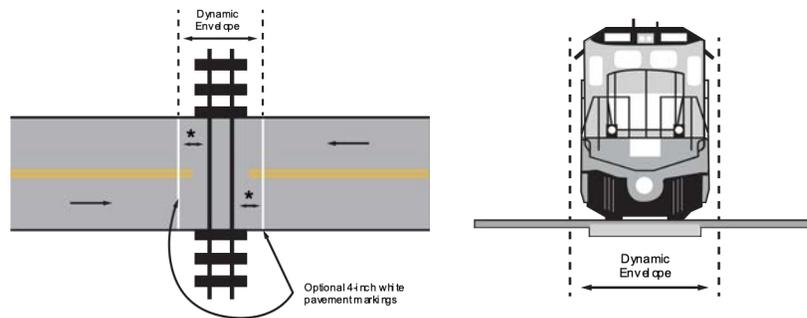


# What is the Railroad Dynamic Envelope (RDE)?

## MUTCD Section 8B.29 Definition

The Dynamic Envelope is the clearance required for a train or LRT equipment overhang resulting from any combination of loading, lateral motion, or suspension failure

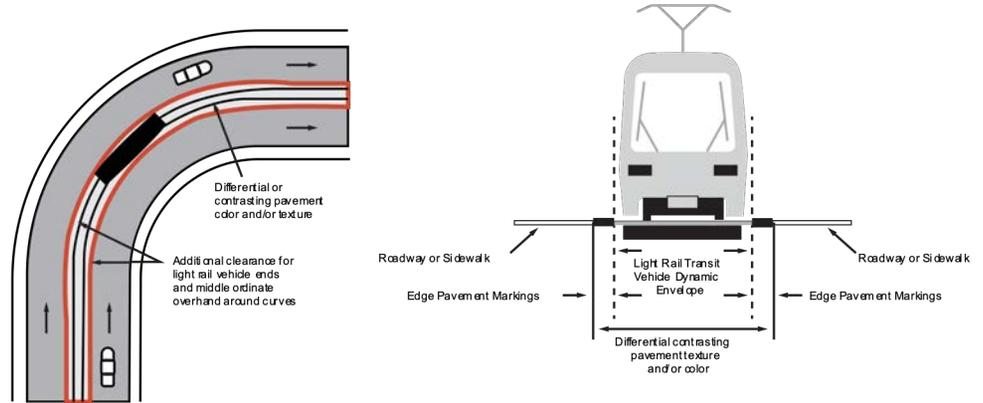
Examples of Dynamic Envelope Pavement Markings at Grade Crossings



\* The distance between the rail and the dynamic envelope should be equal to 6 feet unless otherwise advised by the operating railroad or light rail transit agency.

**LEGEND** ———  
 → Direction of Travel

Examples of Light Rail Transit Vehicle Dynamic Envelope Markings for Mixed-Use Alignments



**Contrasting Color and/or Texture**

## Pilot Project

### Commercial Boulevard (ID# 628186E)

- Historically high grade-crossing crash risk
- 2-day overnight installation (December 9 – 10, 2012) with a cost of \$37,000

#### Results:

- 45% reduction in vehicles stopped within RDE in the eastbound direction
- 15% reduction in vehicles stopped within RDE westbound direction
- More than 50% reduction in descending violations (i.e. vehicles stuck inside gates during an activation)



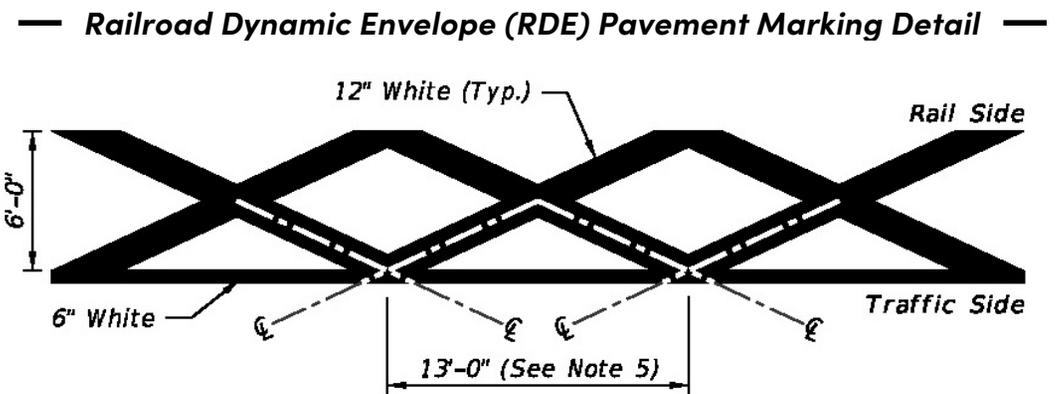
# Roadway Design Bulletin 20-02

## New Pavement Marking

Include RDE white 'X' pavement markings only at the following at-grade railroad crossings:

- State roads
- State-owned rails
- State-owned property

Include a 4-inch wide black contrast border on both sides of each 12-inch wide marking when installed on concrete surfaces.



# Roadway Design Bulletin 20-02

## Additional Signage

For side roads with at-grade crossings within 100 feet of the edge of traveled way, include W10-2, W10-3 or W10-4 signs on the mainline state road in accordance with the MUTCD.



W10-1



W10-1a



W10-2



W10-3



W10-4



W10-7  
Activated  
Blank-Out



I-12



W10-5



W10-11



W10-12



W10-11a

OR



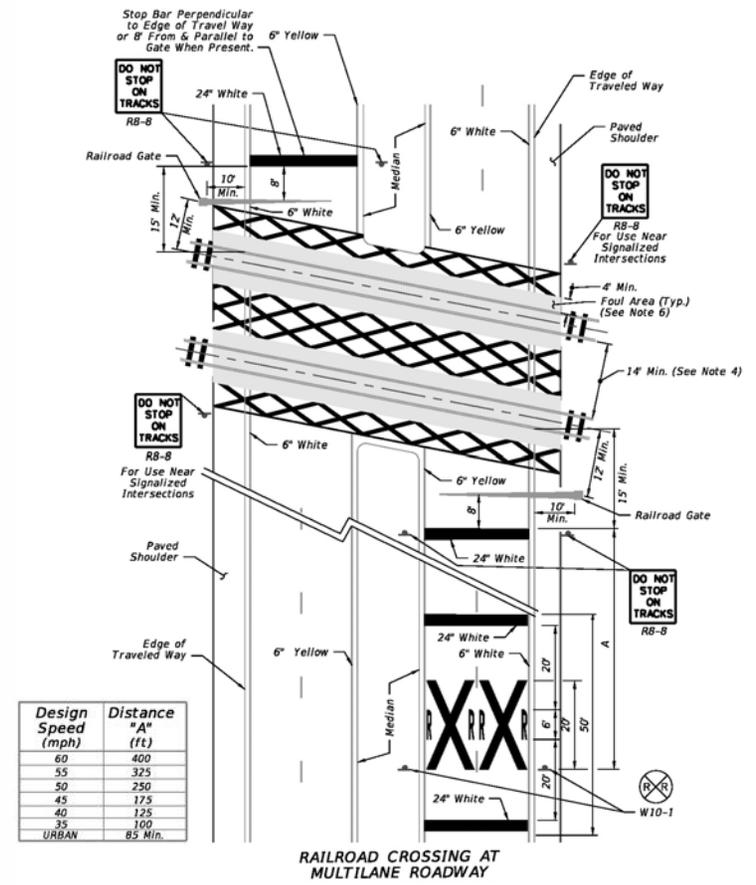
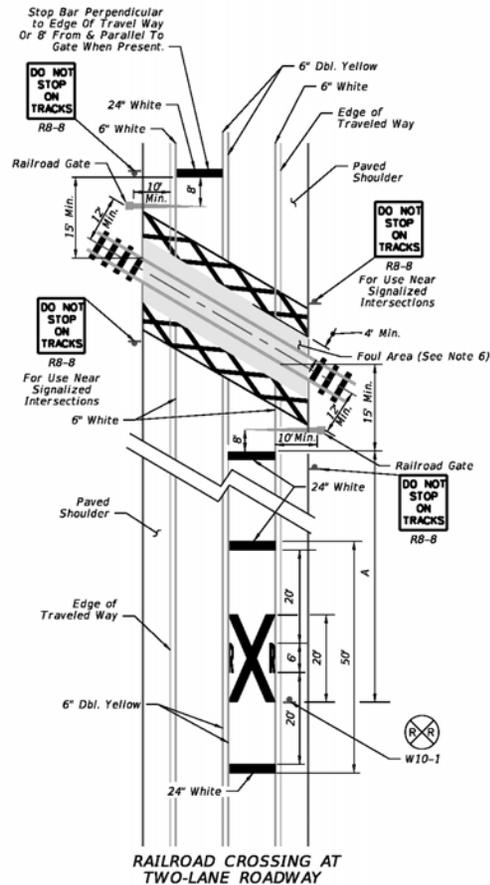
W10-11b

OR



# New Railroad Crossing Configuration

NEW FDOT Standard  
Index 509-070  
Sheet 3 of 4



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