

FRA/Volpe Center Trespass Prevention Research

*Sponsored by the FRA Office of Research & Development
Train Control & Communications Division*

**2013 National Highway-Rail Grade
Crossing Safety Training Conference**



November 5, 2013



Outline



- ❑ Trespass Problem
- ❑ FRA/FTA Trespass Workshop
- ❑ CARE Model Demonstration in West Palm Beach, FL



U.S. Department
of Transportation

**Federal Railroad
Administration**

*Sponsored by the FRA Office of Research & Development
Train Control & Communications Division*

Railroad Trespass Example



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2013 SFRC (West Palm Beach, FL)

Railroad Trespass Example

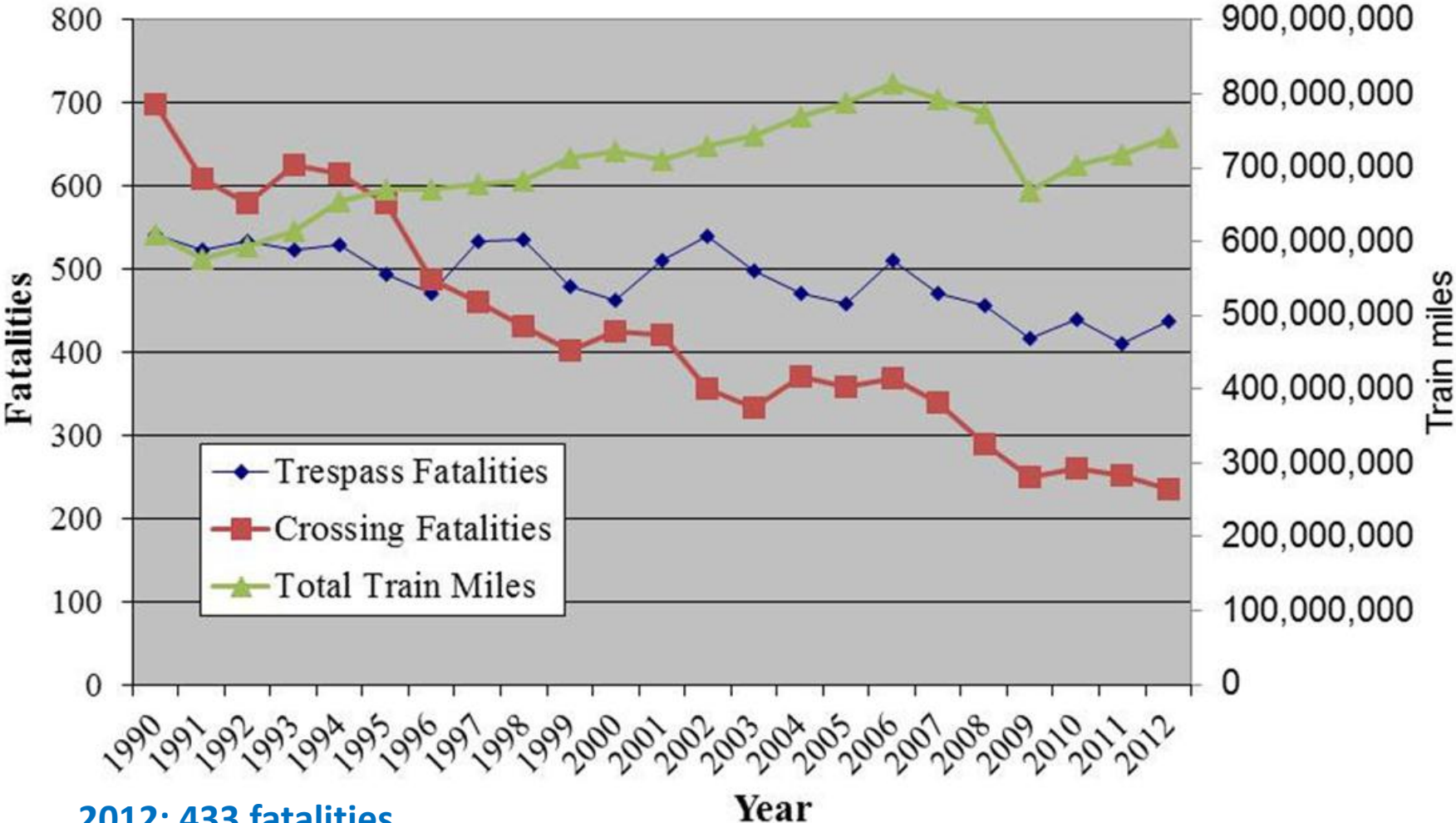
2013 SFRC (West Palm Beach, FL)



Railroad Trespass Examples



The Problem



2012: 433 fatalities

Jan-Jul 2012 vs Jan-Jul 2013: 248 vs 292 (17.7% increase)

<http://safetydata.fra.dot.gov/OfficeofSafety/default.aspx>

Railroad Right-of-Way Trespass Workshop



- August 14-16, 2012
- Keynote address by FRA Administrator Joseph C. Szabo
- 175 Attendees
- 6 Technical Sessions
- Breakout groups developed Research Needs



»»» **AUG 14-16**
ST. LOUIS, MISSOURI



Railroad Right-of-Way Trespass Workshop

- Breakout groups developed Research Needs
 - Over 90 suggested ideas
 - 23 Research Need statements developed
 - FRA has initiated research on several recommendations



<http://www.fra.dot.gov/conference/trespass2012/>

Railroad Right-of-Way Trespass Workshop – Research Needs

TOPIC AREA	TITLE
1. Pedestrian Safety Issues	Data collection and analysis
	Engineering design
	Distracted behavior—pedestrians and cyclists
	Lack of standard signage and evaluation of effectiveness of each type
2. Hazard Management	Safety culture
	Data collection
	Define hazard management
3. Design, Technology, Infrastructure	Fencing design and utilization
	Barriers designed to mitigate pedestrian distraction
	Exploratory technology research and education
	Train-activated in-pavement lights

TOPIC AREA	TITLE
4. Community Outreach	Public awareness campaign
	Community outreach partnerships
	National Community Awareness Day
5. Enforcement	Outreach and awareness toolkit
	Seek full police authority, across all 50 States, for railroad police officers
	Develop specific railroad/transit trespass law that can be applied broadly across the United States (consistent language)
	(a) Focus on “high value” targets, i.e., trespassers with malicious intent, homeless, drug/alcohol, other; (b) Strategies for different types of trespassers—casual, impaired, malicious
	Strive to have “crucial conversations” with local courts and prosecutors to prioritize trespass
	Seek opportunities to apply for and/or develop law enforcement grants that can target trespass cases
6. Intentional Deaths/Acts	Education
	Eliminating trigger terminology from public communication
	Exploration of trespass prevention messaging

Trespass Prevention Research Study

West Palm Beach, FL

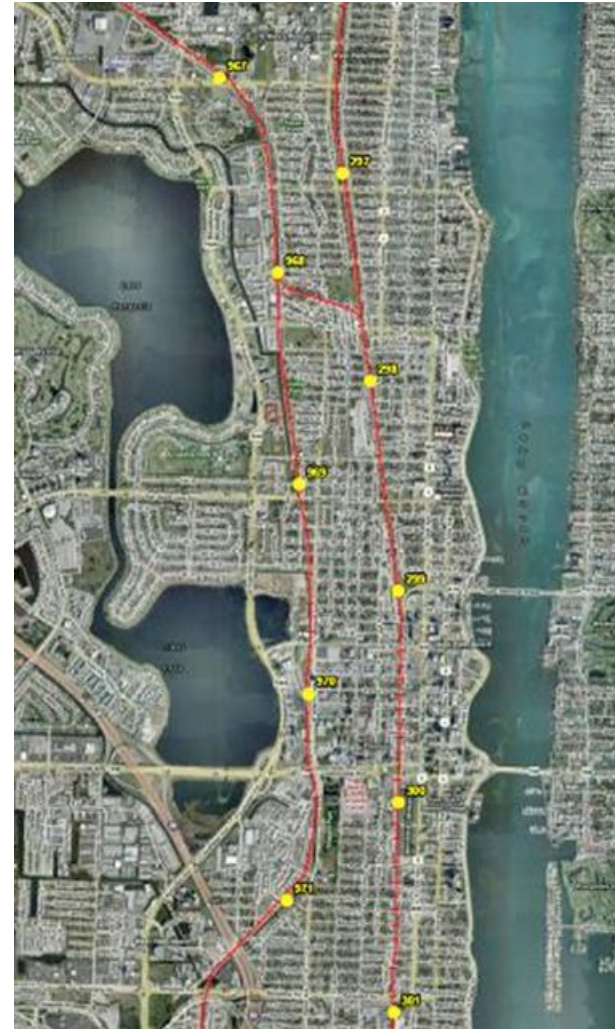
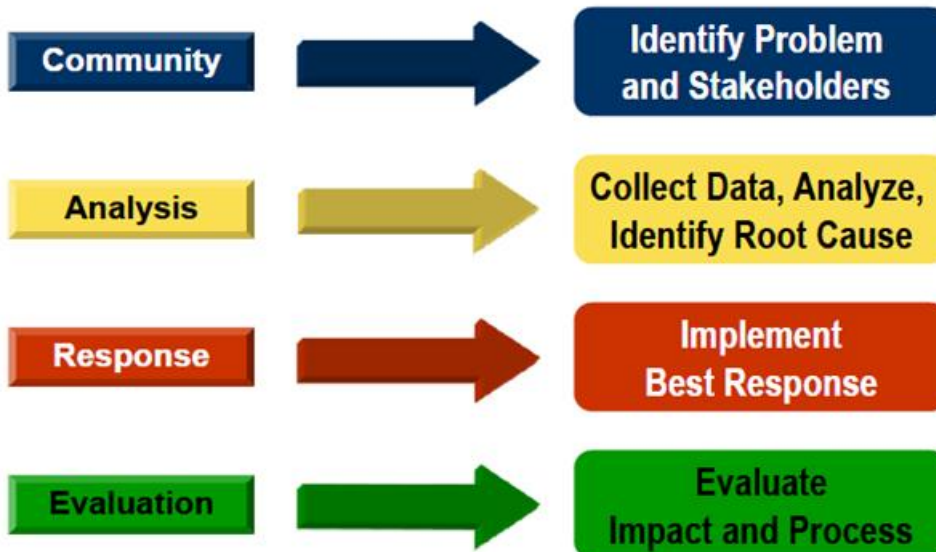
Research Objective

- Eliminate trespasser incidents and fatalities
- Provide national guidance on trespass mitigation
- Initiative started in 2009

Study Area

- City of West Palm Beach, FL (2 corridors)
 - SFRTA, CSX, Amtrak (milepost 966-973)
 - FEC (milepost 296-301)

Approach:



Trespassing on Railway Lines, A Community Problem-Solving Guide.
www.direction2006.com/documents/pdf/en_TrespGuide2003.Pdf

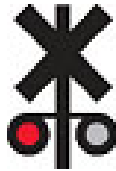
Trespass Prevention Research Study

West Palm Beach, FL



U.S. Department of Transportation

Federal Railroad Administration



OPERATION LIFESAVER®
Florida



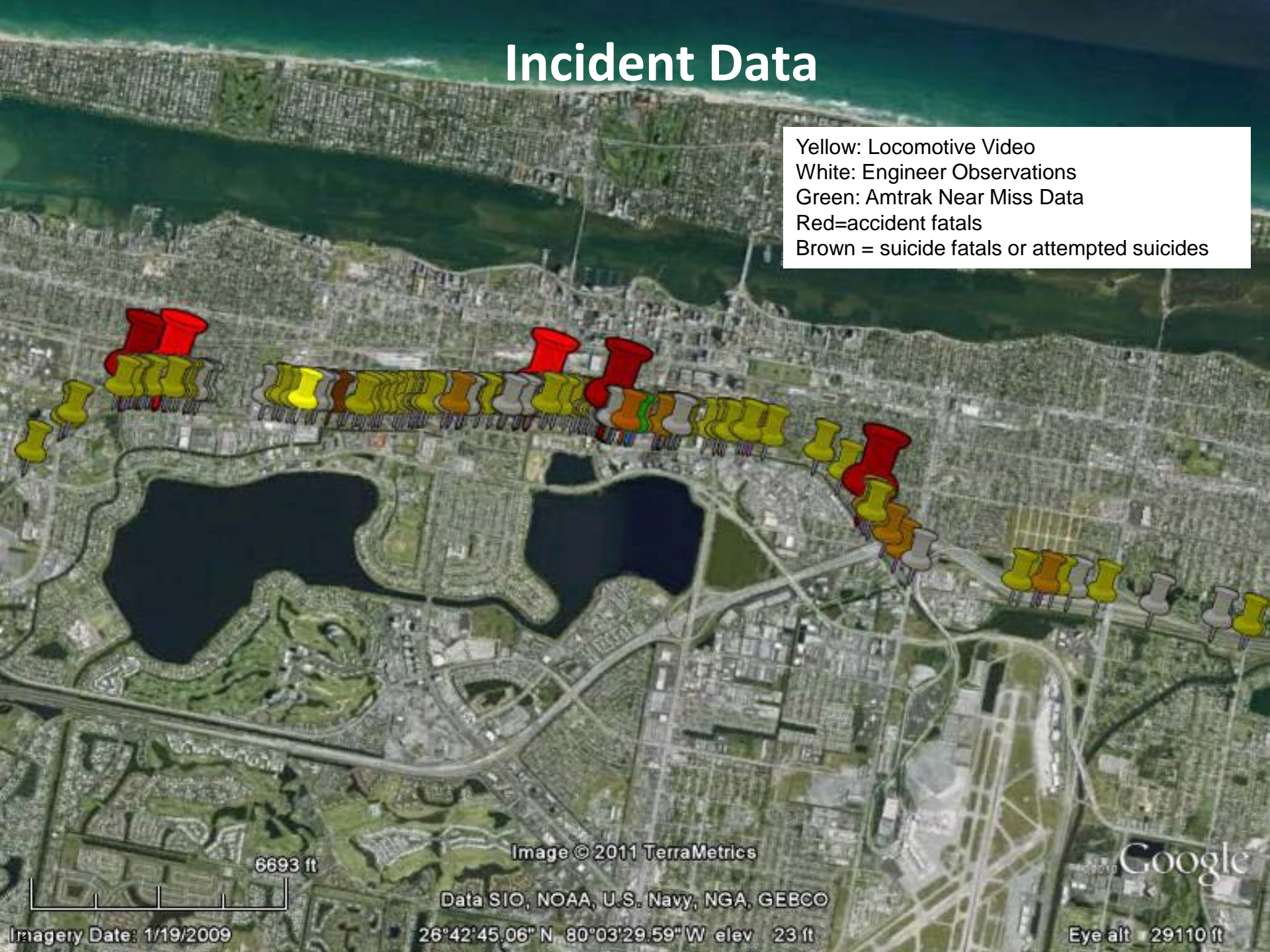
PALM BEACH COUNTY SHERIFF'S OFFICE



West Palm Beach Neighborhood Associations

Incident Data

Yellow: Locomotive Video
White: Engineer Observations
Green: Amtrak Near Miss Data
Red=accident fatalities
Brown = suicide fatalities or attempted suicides



6693 ft

Image © 2011 TerraMetrics

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

26°42'45.06" N 80°03'29.59" W elev 23 ft

Google

Eye alt 29110 ft

Imagery Date: 1/19/2009

Hazard Analysis Methodology

- Uses the System Safety Program Hazard Identification/Resolution Process which is based on US-MIL Standard 882D¹
 - Used by several transit agencies, including SFRTA, within their System Safety Program
- By determining the hazard severity and probability, the hazard can be reduced to its lowest practical level
- Attempt to apply methodology to the trespass problem

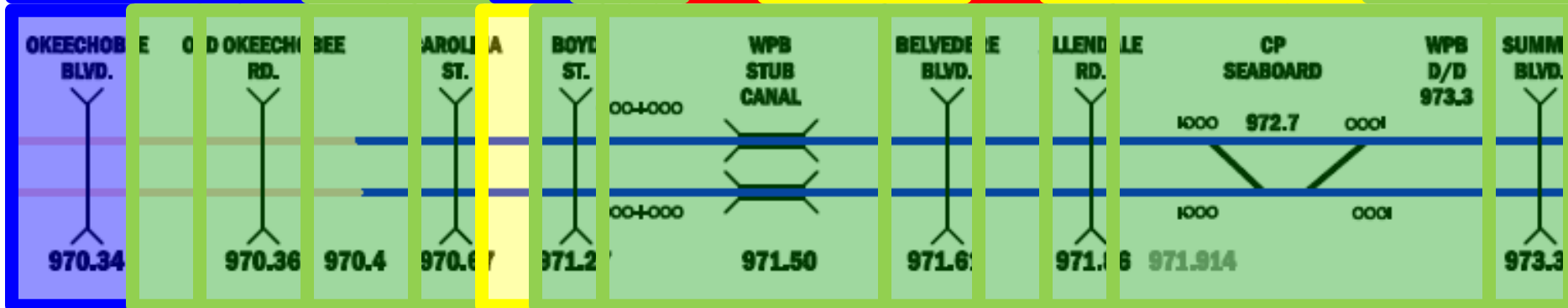
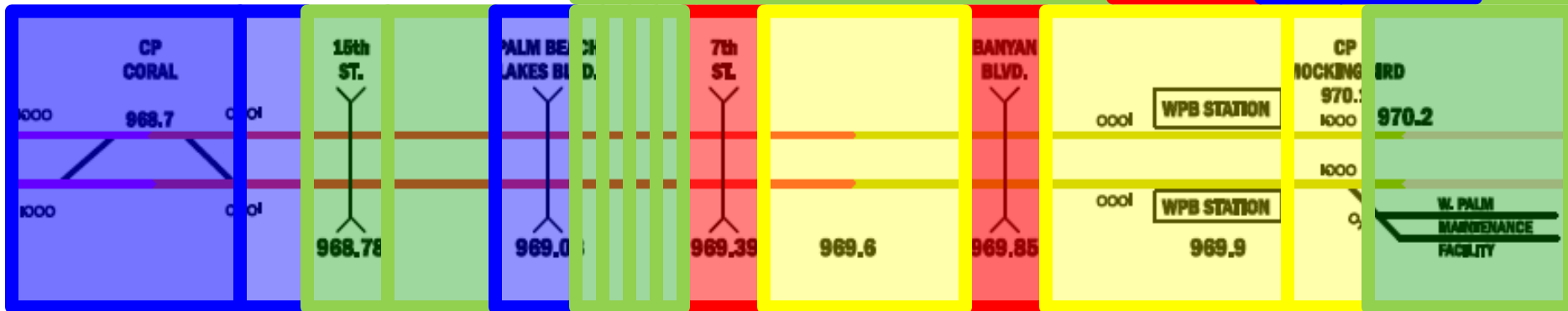
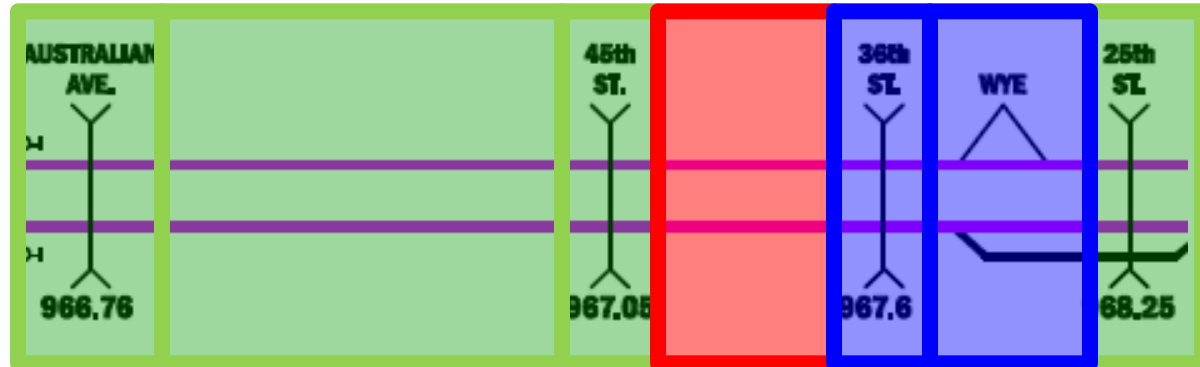
¹Military Standard 882D, *System Safety Program Requirements*, Department of Defense, Washington, DC
January 19, 1993

<http://www.acq.osd.mil/atptf/policy/documents/MILSTD882D.pdf>

Trespass Prevention Research Study

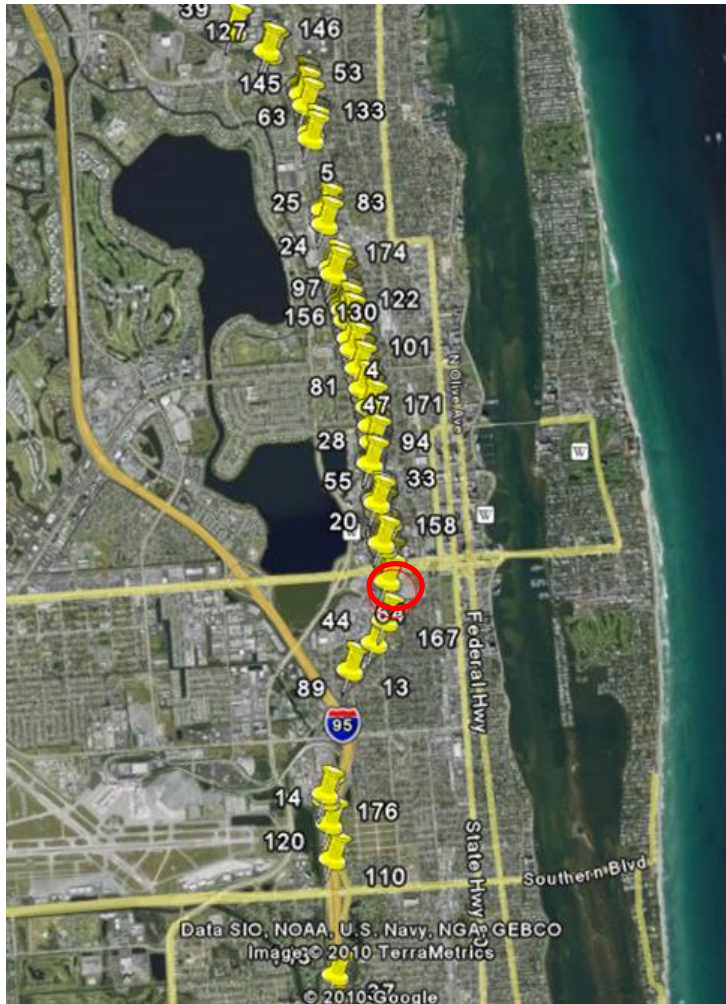
West Palm Beach, FL

- A (high risk):
- B (medium risk):
- C (low risk):
- D (negligible risk):



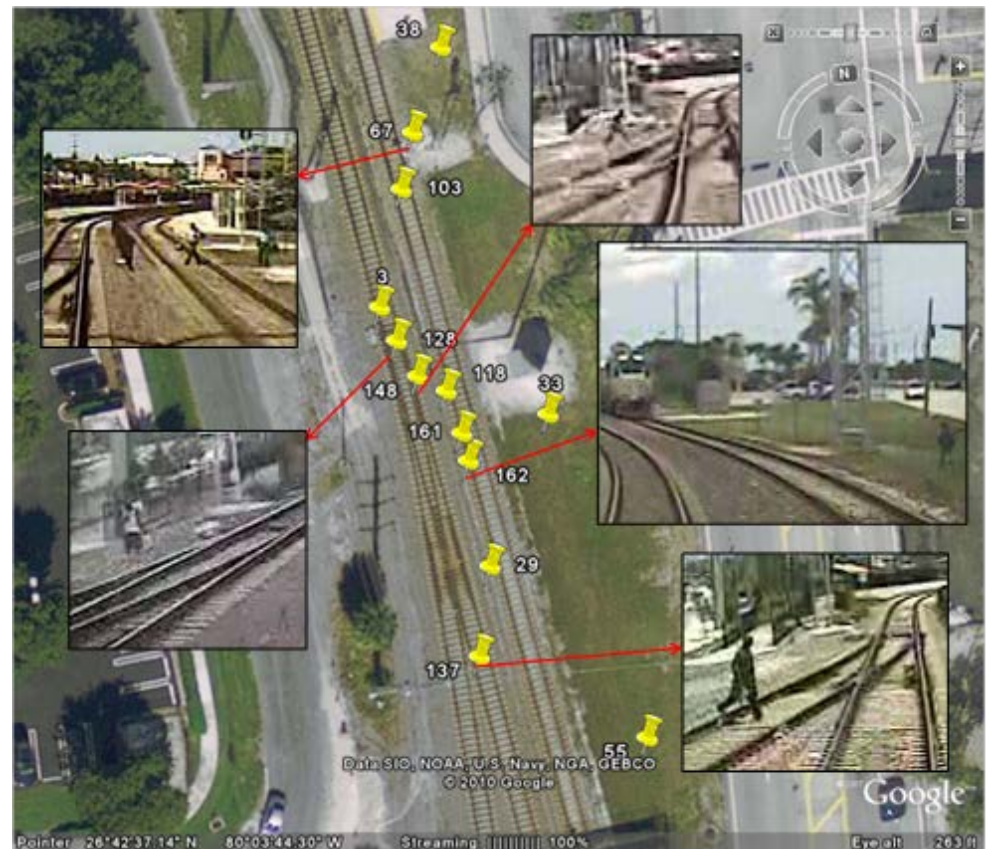
Incident Data Analysis – Locomotive Video Sample

CP Mockingbird (South of WPB station platform)



13 trespass events (locomotive video)

- All involved trespassers crossing the tracks



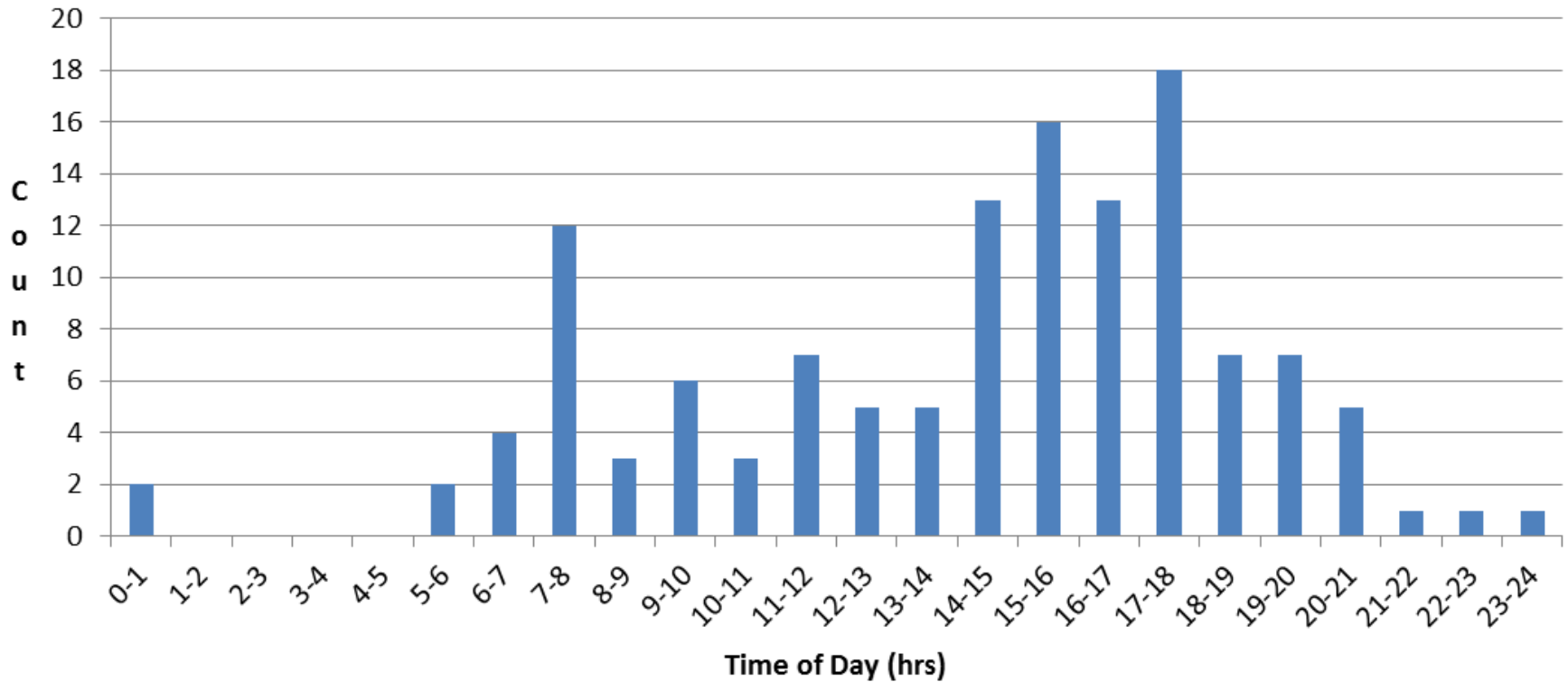
Mockingbird CP

- System operational 11/15/12-02/12/13 (92 days)
- 24 hr Analysis (11/15/12 (Thu) 5PM -11/16/12 (Fri) 5 PM)
 - 131 trespassers
 - 49 EB (16 to/from West platform ramp)
 - 82 WB (27 to West platform ramp)
 - 46% 2PM-6PM



Mockingbird CP

24-hr Trespass Count at Mockingbird CP
(Nov 15-16, 2012)



Recommended Mitigation Strategies

Mockingbird Control Point (South end of West Palm Beach Station)


Trespass characteristics:

Most events involve rail and/or bus system users walking between west side of the ROW and east side station platform or Tamarind Avenue. Many trespassers are students at the Alexander W Dreyfoos Jr School on Tamarind Avenue.

Location ID: A20
Description: Mockingbird CP

Priority Score: 12.5
Risk Class: B (Medium Risk)

Trespass History:
13 trespass events recorded via Tri-Rail locomotive video (03/06/10-07/06/10)
2 trespass events noted via Veeva reports (04/07/10-04/19/10)



Trespass Characteristics
Most events involve rail and/or bus system users walking between west side of the ROW and east side station platform or Tamarind Avenue. Many trespassers are students at the Alexander W Dreyfoos Jr School on Tamarind Avenue.

Potential Mitigation Strategies

Engineering

- The creation of a Pedestrian-only Grade Crossing south of the station could provide pedestrians with a safe, closer at-grade alternative to reach destinations south and east of the station.
- The Extension of the Inter-Track Fence could eliminate the hazards of unsafe trespass behavior but could also have negative impacts on the rail system users.
 - o The Extension of the Existing Fence west of the ROW could also reduce access to the ROW at this location.
- The Continuation of a Tri-Rail Operational Change, whereby southbound trains are routed to the East track for afternoon service, could also be maintained as a solution to minimize unsafe behavior.

Education

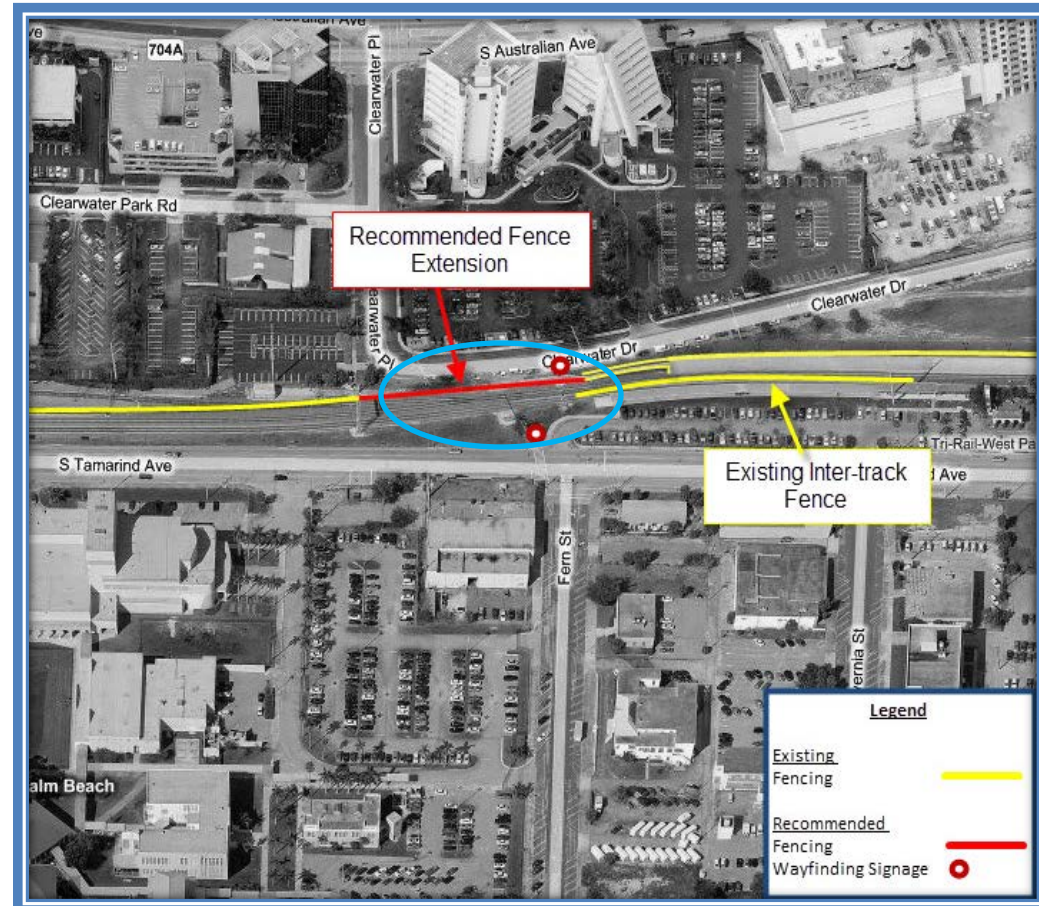
- A Targeted Pedestrian Blitz aimed at Tri-Rail, Amtrak, Palm Tran riders, and Dreyfoos students could be implemented to enhance pedestrian awareness.

Enforcement

- A Targeted Enforcement Campaign at the station could support an education campaign while gaining further publicity for safe crossing practices. Stiff penalties such as delayed or denied boarding after a trespass violation could help deter future unsafe behavior.
- Better Display of Penalties, including posted signs with signal-violation penalties, can also serve as an effective deterrent.

SUG Recommended Risk Control Measures
The SUG recommended an extension of the inter-track fence, and the installation of a "Trespass Guard" near Mockingbird CP to prevent pedestrians from walking on the ROW and crossing the track. The SUG recommended a targeted pedestrian blitz aimed at Tri-rail, Amtrak, Palm Tran riders and Dreyfoos students along with an enforcement campaign with penalties such as delayed or denied boarding for trespassers.

John A. Volpe National Transportation Systems Center



The Recommended Fence Extension will connect the pedestrian ramp inner fence on the West side of the tracks (across the tracks from the bungalow) to the existing fence at the end of the parking lot further south.

Next Steps

- ❑ Support Implementation of Trespass Strategies
- ❑ Evaluation
 - Continue data collection at select trespass locations
 - Install surveillance equipment at additional locations
 - Assess effectiveness of implemented treatments
- ❑ Refine model and implement on another candidate site
- ❑ Guidance/best practices FRA R&D Report





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Highway-Rail Grade Crossing and Trespass
Prevention Research Program**

US DOT | RITA | Volpe Center

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