Trespass Prevention Research Study

Project initiated August 2009

Objective

• Eliminate trespasser incidents and fatalities
• Provide national guidance on trespass mitigation

Study Area

• City of West Palm Beach, FL
  – SFRTA (TriRail)/CSX/Amtrak (milepost 966-973)
  – FEC (milepost 296-301)

Sponsored by the FRA Office of Research and Development - Signal, Train Control and Communications Division
Trespass Prevention Research Study

Stakeholders

West Palm Beach
Neighborhood Associations

Palm Beach County Sheriff’s Office
Recent/Current Activities

• Stakeholder Meetings
  – Field Review (completed July 20, 2012)
  – Sept/Oct 2012 (upcoming)

• Data collection
  – Interview with individual stakeholders (completed)
  – TriRail right-of-way site inspection (completed)
  – FEC right-of-way site inspection (completed)
  – TriRail locomotive video analysis (completed)

• Education/outreach participation
  – Oct 2009 - Safety Blitz (completed)
  – Apr 2010, June 2011, June 2012 - Train Safety Awareness Week (completed)
## Incident Data Collection

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Data Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRA</td>
<td>Incident data</td>
<td>✔</td>
</tr>
<tr>
<td>Volpe/FRA</td>
<td>Field observations</td>
<td>✔</td>
</tr>
<tr>
<td>SFRTA</td>
<td>Incident data</td>
<td>✔</td>
</tr>
<tr>
<td>SFRTA</td>
<td>Train crew observations</td>
<td>✔</td>
</tr>
<tr>
<td>SFRTA</td>
<td>Locomotive video</td>
<td>✔</td>
</tr>
<tr>
<td>Amtrak Police</td>
<td>Incident Data</td>
<td>✔</td>
</tr>
<tr>
<td>CSXT Police</td>
<td>Incident Data</td>
<td></td>
</tr>
<tr>
<td>FEC Police</td>
<td>Incident Data</td>
<td></td>
</tr>
<tr>
<td>West Palm Beach PD</td>
<td>Violation/Incident data</td>
<td></td>
</tr>
<tr>
<td>PB County School District PD</td>
<td>Incident Data</td>
<td></td>
</tr>
</tbody>
</table>

As of Aug 2012
Hazard Analysis Methodology

- Uses the System Safety Program Hazard Identification/Resolution Process which is based on US-MIL Standard 882D\(^1\)
  - 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

Hazard Analysis and Resolution Process

Define the System

Define
- Physical Characteristics
- Functional Characteristic

Understand and Evaluate
- People,
- Procedures,
- Facilities, and Equipment,
- Environment.

Identify Hazards

Identify
- Hazards
- Undesired Events

Determine
- causes and
- contributing factors
of the Hazards

Assess Hazards

Determine
- Severity
- Probability

Decide
- to accept risk or
- eliminate / control
the Hazards

Resolve Hazards

Assume Risk of the Hazard
or
Implement Corrective Action
- Eliminate the Hazard
or
- Control the Hazard

Follow-Up

Monitor for
- Effectiveness
- Unexpected Hazards

Hazard Analysis Methodology - 3. Assess Hazards

Assessment criteria examples

- Prior incidents
- Near miss history
- Track curvature
- Sight obstructions
- Number of tracks
- Train speed
- Prevalent trespass type (along/cross)
- Attractive nuisances (schools, community centers, parks...)
- Number of daily trains
- Suicide??

Rating Scheme

- Assign weight (point rating) for each type of criteria
- Add up points, resulting in a **risk-based prioritized list**
Hazard Analysis Methodology

Trespass Severity
**Trespass Location Severity Analysis (TLSA)**

Priority Score Mapping to Risk Class (proposed)

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>PS Requirement</th>
<th>Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (high risk)</td>
<td>PS ≥ 20</td>
<td>3</td>
</tr>
<tr>
<td>B (medium risk)</td>
<td>10 ≤ PS &lt; 20</td>
<td>4</td>
</tr>
<tr>
<td>C (low risk)</td>
<td>5 ≤ PS &lt; 10</td>
<td>6</td>
</tr>
<tr>
<td>D (negligible risk)</td>
<td>PS &lt; 5</td>
<td>21</td>
</tr>
</tbody>
</table>

![Priority Score Table]

Trespass Location Severity Analysis (TLSA)

A (high risk):
B (medium risk):
C (low risk):
D (negligible risk):
TLSA – ROW between 45th and 36th

2 fatalities
14 trespass events
- 7 within 100 ft of end of canal
- All 7 between 2:14 PM and 6:03 PM
- Northmore Elementary School (and playground) on East side

Risk Class A (high risk)
TLSA – ROW between 45th and 36th
Recommended Mitigation Strategies (March 9, 2012)

Trespass Characteristics
Most events involve pedestrians violating the pedestrian gates at the crossing.

Potential Mitigation Strategies

Engineering
- A Pedestrian Channelization System could restrict pedestrian movement to designated areas within the crossing while closing gaps in the existing fencing along the ROW.
  - Fencing / Landscaping / Jersey Barriers
  - 2-gates / Swing Gates
  - Pedestrian gate skirts
- Static Wayfinding Signage along the corridor could be installed to direct pedestrians to appropriate crossing points.

Education
- A Targeted Pedestrian Blitz could be designed to enhance pedestrian awareness to the potential hazards of disregarding railroad warning devices.
- A System-wide Education Program could also enhance pedestrian awareness and compliance with posted signs and regulations.

Enforcement
- A Targeted Enforcement Campaign at the crossing could support an education campaign while gaining further publicity for safe crossing practices.
- 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 noted that in the existing channelization system allows pedestrians and vehicles to consistently violate the grade crossing warning devices. The proposed engineering treatments at 7th Street included enhanced channelization using fencing or landscaping to contain crossing activity. The SUG also supported the use of gate skirts in conjunction with the channelization. The SUG endorsed wayfinding signage throughout the corridor to direct pedestrians to the nearest safe crossing point. As an education strategy, the group proposed a coordinated effort that would engage customers of the businesses located along Tamarind Avenue. The group also noted that the West Palm Beach athletic league adjacent to the crossing could offer the potential to leverage a combined education and enforcement campaign focused on 7th Street.
Field Review (July 20, 2012)
Next Steps

- Support Implementation
- Evaluation
  - Install surveillance equipment at select locations for further trespass data collection
  - Assess effectiveness of implemented treatments
- Roll-out to other high trespass areas
- Guidance/best practices
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