Update on U.S. Rail Trespassing & Suicide: Research Findings & Needs

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Rail Conference
Denver, CO

Presented by:
Joyce Rose, Chairman, Subcommittee on Railroad Right-of-Way Trespass & Suicide Prevention
Transportation Research Board
Federal Railroad Administration Safety Statistics:

• From 2012-2015, 43% of railroad fatalities were trespassers and 29% were suicide

• In 2017, there were a total of 1,062 fatalities on FRA-regulated rail systems (includes freight, Amtrak and commuter rail)

• 2017 trespassing and suicide fatalities: 782 (74% of total fatalities)

• The split is 70% trespass and 30% suicide, subject to change as cause of death officially determined

Federal Transit Administration Safety Statistics:

• In 2017, there were a total of 145 FTA-reported fatalities on rail transit systems (Metro, Light Rail, Streetcar)

• Of these transit fatalities, 66 were suicides; 25 were people waiting or leaving; 19 were bicyclists or pedestrians
2017 Fatalities on the U.S. General Railway System

Regulated by FRA

1,062 total fatalities

73% of deaths trespass or suicide

2017 General Railway System Fatalities (freight, Amtrak & commuter rail)

- Trespassing: 52%
- Suicide: 21%
- Crossing Collisions: 26%
- Employees: 1%

Scope of the Problem
2017 Fatalities on U.S. Rail Transit Systems

Rail Transit includes Metro, Light Rail, Streetcars

Regulated by SSOAs and FTA

145 total fatalities

45% of deaths were suicide (66)

No specific “trespassing” data
Seeing the “Big Picture”

- There is no easy way to compile FRA and FTA safety data together, or to compare relative risk factors
- FRA and FTA use different measures for safety data

<table>
<thead>
<tr>
<th>FRA</th>
<th>FTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crossing Collisions</td>
<td>Other Vehicle Occupant</td>
</tr>
<tr>
<td>Trespassing</td>
<td>Ped in Crossing</td>
</tr>
<tr>
<td></td>
<td>Ped Not in Crossing</td>
</tr>
<tr>
<td></td>
<td>Ped Crossing Tracks</td>
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<tr>
<td></td>
<td>Ped Walking Along Tracks</td>
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<tr>
<td>Suicide</td>
<td>Suicide</td>
</tr>
<tr>
<td>Employee on Duty</td>
<td>Operator</td>
</tr>
<tr>
<td></td>
<td>Employee</td>
</tr>
<tr>
<td></td>
<td>Other Worker</td>
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<tr>
<td></td>
<td>Bicyclist</td>
</tr>
<tr>
<td>Non-Crossing Collisions</td>
<td>Passenger</td>
</tr>
<tr>
<td></td>
<td>People Waiting or Leaving</td>
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</table>
OK, Rail Trespassing and Suicide is a big problem....

How do we find the answer?

Neil Armstrong: “Research is creating new knowledge”
Role of FRA

Most rail trespassing research in U.S. is conducted by FRA through Volpe Transportation Systems Center

FRA has conducted Research Needs Workshops on trespass and suicide prevention in 2008, 2012 and 2015

The workshops –

• Provide FRA and stakeholders with update on research and demonstration activities
• Solicit ideas for new or expanded initiatives, programs, or research projects
Pedestrian Safety Issues

1. Effective Signage
2. Crossing Guards
3. Grade Crossing Safety Clearinghouse
4. Pedestrian Safety Workshop
5. Best Practices Guide

Design, Technology & Infrastructure

6. Unmanned Aerial Vehicle use for detection
7. Automated or operator-based technologies to detect trespasser and ROW obstructions
8. Technologies to influence human behavior
9. Environments and conditions mitigations
10. Standardized data for collecting and reporting trespass, near-miss, hot spots
Community Outreach & Education

11. Target national associations to raise trespass awareness
12. U.S. National Railroad Safety Day/Week
13. Community outreach with Major League sports teams
14. Nationwide media buy public awareness campaign
15. Driver’s Ed and CDL licensing test questions on rail safety

Enforcement

16. Model Trespass Statute for States
17. Grant Program for Railroad Safety Enforcement
18. Model Railroad Law Enforcement Authority
19. Use of technology by local law enforcement agencies to detect, deter and apprehend trespassers
Top 24 Recommended Actions from 2015 Research Needs Workshop

**Intentional Deaths/Suicide Attempts**

20. Talk to suicide survivors for best practices
21. Develop rail media guidelines for responsible reporting
22. Coroner education – current determination process slow and inconsistent, need better quality data
23. Universal rail emergency phone number
Role of Transportation Research Board

• In January 2017, TRB AHB60 Standing Committee on Highway/Rail Grade Crossings formed a Subcommittee to focus on Rail ROW trespass and suicide research

• First task of the Subcommittee has been a Literature Review of recent research

• Total of 102 research studies reviewed, of which 46 were cited in the resulting report

• The Literature Review helped the Subcommittee:
  • Make general findings regarding rail trespass and suicide epidemiology, countermeasures, and data adequacy
  • Identify research gaps and needs
# Summary of TRB Literature Review Findings

<table>
<thead>
<tr>
<th>Study Process</th>
<th>Epidemiologic Findings</th>
<th>Causation and Risk Factor Findings</th>
<th>Countermeasure Findings</th>
<th>Data Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recent studies (2010 onward)</td>
<td>Rail suicide is much more prevalent choice in EU than U.S. (12% vs. &lt;1%)</td>
<td>Rail suicides tend to occur in suburban or rural areas.</td>
<td>Organizational and procedural measures</td>
<td>FRA and FTA data is not harmonized</td>
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<tr>
<td>102 studies reviewed, 49 studies cited</td>
<td>Rail trespassing is much more prevalent in U.S. than EU (&gt;43% in U.S. vs. 17% in EU)</td>
<td>Rail suicides have a high percentage of co-morbidity with alcohol (94% above .08 BAC)</td>
<td>Physical and technological measures</td>
<td>Sample sets tend to be limited and study periods short</td>
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<td>28 studies applied to U.S. systems</td>
<td>Lethality: 50% of trespassers are fatal; 90% of rail suicides fatal</td>
<td>About 50% of rail trespasser fatalities had alcohol or drugs in their system</td>
<td>Automatic detection and warning</td>
<td>More studies needed to increase empirical data</td>
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<td>Demographics Victim Age: 38. Men outnumber women 3.5 to 1.</td>
<td>55 percent of rail trespassing fatalities were using headphones or mobile phones</td>
<td>Public awareness and education measures</td>
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<td>A potential factor in higher rail suicide risk in EU vs. U.S. could be firearm availability</td>
<td>Law enforcement approaches</td>
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# Top 10 Research Needs Identified

<table>
<thead>
<tr>
<th>Need</th>
<th>Research Needs - Short Description</th>
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<tbody>
<tr>
<td>One</td>
<td>Analyze factors that influence <strong>lethality</strong> of trespassing and railroad suicide attempts.</td>
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<td>Two</td>
<td><strong>Access Control</strong>: Evaluate the &quot;built environments&quot; around and along rail rights-of-way to determine most common reasons for trespassing and points of access. Explore initiatives to minimize trespassing opportunity that can be generalized to other communities.</td>
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<td>Three</td>
<td><strong>Data</strong>: Identify and evaluate rail trespass and suicide-related data sources. Explore harmonization of FRA and FTA trespass and suicide data.</td>
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<td>Four</td>
<td><strong>Countermeasure</strong>: Behavioral analysis to understand impact and effectiveness of anti-trespass education</td>
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<td>Five</td>
<td><strong>Countermeasure</strong>: Survey railroad employees to identify and evaluate trespass locations, countermeasures</td>
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<td><strong>Access Control</strong>: Evaluate the &quot;built environments&quot; around and along rail rights-of-way to determine most common reasons for trespassing and points of access. Explore initiatives to minimize trespassing opportunity that can be generalized to other communities.</td>
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<tr>
<td>Seven</td>
<td><strong>Access Control</strong>: Identify and evaluate the design of railroad rights-of-way to determine specific points of access and minimize trespassing opportunities.</td>
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<td>Eight</td>
<td><strong>Detection</strong>: Describe and estimate costs and effectiveness of different trespass detection technologies, including UAVs, forward-facing cameras on locomotives, Strava fitness mapping data.</td>
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<tr>
<td>Nine</td>
<td>Understand <strong>causal factors/intent</strong> of rail trespassers and persons attempting suicide.</td>
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**TRB**

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

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**WSP**
The Ask

Can your agency, company, or organization help further this research?

I have ideas on potential research programs that might have available funding – please contact me!

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