

FTA

FEDERAL TRANSIT ADMINISTRATION

Transit Advisory Committee for Safety (TRACS)

Trespasser and Suicide Prevention Subcommittee

TRACS Committee Meeting
September 9-10, 2019



U.S. Department of Transportation
Federal Transit Administration

Subcommittee on Trespasser and Suicide Prevention

Subcommittee Members	Organization
Joyce Rose (Lead)	WSP USA
David Harris	New Mexico DOT
Jeff Lau	Bay Area Rapid Transit (BART)
Karen Philbrick	Mineta Transportation Institute (MTI)



Subcommittee Meetings Recap

- *June 13 meeting: **Transit and Rail Trespass and Suicide Incident Data Analysis***
[Lisa Staes, CUTR]
- *July 11 meeting: **Overview of Current Rail Trespass and Suicide Prevention Efforts***
[Scott Gabree, Volpe Center]
- *August 19 meeting: **Report-Out of Literature Reviews and Decision on Studies to be Presented***

Research Literature Review Process

- *52 research articles, conference presentations, and other documents gathered by FTA and subcommittee members*
- *Subcommittee narrowed down to 19 most relevant articles for review*
- *Reviews focused on emerging technologies and transportation innovations that can be implemented by FTA*
- *Developed a standard “Article Recap Form” for literature reviews*

Article Recap Form

- *Based on RESTRAIL (**RE**duction of **S**uicides and **T**respasses on **RAIL**way property) framework*
- *Organize the problem and mitigation measures by:*
 - *What is the Target Problem? (Trespassing, Suicide or Both)*
 - *Prevention or Mitigation*
 - *What type of Countermeasure Type? (Technology, Education/Training, Organizational/Procedural)*
 - *Effect Mechanism (Improve practice/process, Deter access, Influence behavior, Reduce consequences)*



Research Literature Assignments

David Harris	Jeff Lau	Karen Philbrick	Joyce Rose
Suicide Casualty Trends on Transit Systems in the United States	Remedial Actions to Prevent Suicides on Commuter and Metro Rail Systems	Railroad Implemented Countermeasures to Prevent Suicide: Review of Public Information	A Literature Review of Rail Trespassing and Suicide Prevention Research
Interventions to Reduce Suicides at Suicide Hotspots: A Systematic Review	An Approach for Actions to Prevent Suicides on Commuter and Metro Rail Systems in The United States	Rail-suicide Prevention: Systematic Literature Review of Evidence-based Activities	Optimizing Suicide And Trespass Prevention on Railways; A Problem-solving Model From The RESTRAIL Project
High-security Fencing for Rail Right-of-way Applications: Current Use and Best Practices	Railroad Infrastructure Trespassing Detection Systems Research in Pittsford, New York	Behavioral and Organizational Interventions to Prevent Trespass and Graffiti Vandalism on Railway Property	Artificial Intelligence-aided Automated Detection of Railroad Trespassing
Research and Counter Measures to Reduce Suicide on Railway Rights of Way and Their Impact on Railway Workers	Suicides on Commuter Rail in California: Possible Patterns - A Case Study	Prevention of Railway Trespassing by Automatic Sound Warning— A Pilot Study	An Intrusion Detection System for the Protection of Railway Assets Using Fiber Bragg Grating Sensors
Effects of Three Countermeasures Against the Illegal Crossing of Railway Tracks	The Use of Air Bags for Mitigating Grade Crossing and Trespass Accidents: Literature Review and Research Plan	Does the Installation of Blue Lights on Train Platforms Shift Suicide to Another Station?: Evidence from Japan	

Research Literature Recommendations

Based on recommendations of the reviewers, the subcommittee brings forward 5 studies to the full TRACS committee

1. ***“Remedial Actions to Prevent Suicides on Commuter/ Metro Rail Systems”*** (Jeff Lau)
2. ***“Research & Countermeasures to Reduce Suicide on Railway ROW and Impacts on Railway Workers”*** (Dave Harris)
3. ***“Interventions to Reduce Suicides at Suicide Hotspots”*** (Dave Harris)
4. ***“Railroad Implemented Countermeasures to Prevent Suicide”*** (Karen Philbrick)
5. ***“AI-Aided Automated Detection of Railroad Trespassing”*** (Joyce Rose)

Research Literature Recap: Lau

Recommended study:

- “Remedial Actions to Prevent Suicides on Commuter and Metro Rail Systems”

Main Takeaways

- Invest in railroad employee training on suicide awareness and warning signs
- Engage community around the railroad for a more focused suicide prevention program to be tailored to high-risk groups
- Use monitoring technologies (remote sensing, motion detectors, video feed) to cover for when individuals are circumventing barriers

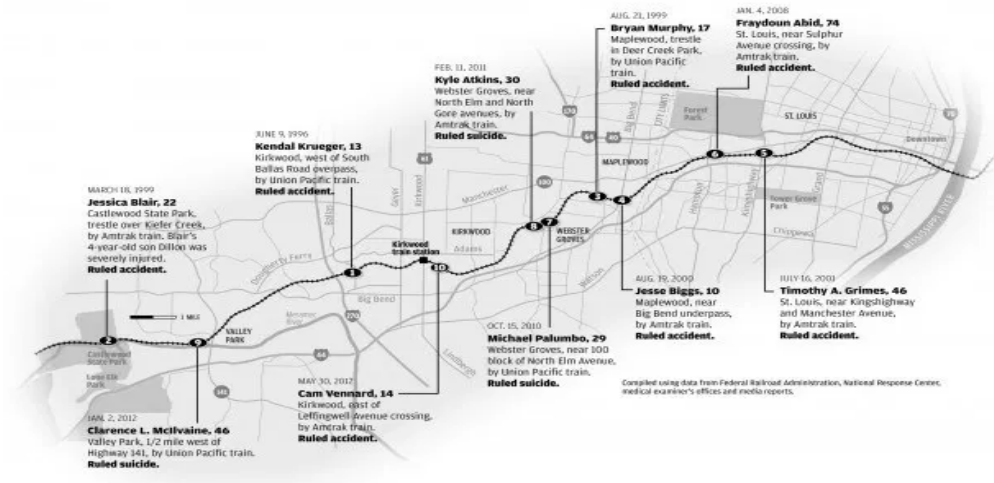
Information Gaps: Lau

- BART experience: Planned pilot project of Platform Screen Door (PSD) at one of our subway station platforms (12th St./Oakland City Center).
- Not fully funded. I am helping to seek funding opportunities to move this project to construction.

Research Literature Recap: Harris

Two recommended studies:

1. *Research and Counter Measures to Reduce Suicide on Railway Rights of Way and Their Impact on Railway Workers*
2. *Interventions to Reduce Suicides at Suicide Hotspots*



Research Literature Recap: Harris

Main Takeaways: *Suicide prevention*

- Encourage help seeking: Suicide phones and Signs
- Increase the likelihood of intervention by a third party (through surveillance and staff training)
- Provide training for mental health institutions in vicinity of tracks
- Use Physical Barriers
- Encourage responsible media reporting of suicide through guidelines for journalists

Research Literature Recap: Harris

Main Takeaways: *Railway crew impact/consequence mitigation*

- Establish clear and adapted protocols for incident management and treatment and make a special effort to strictly respect those protocols
- Improve access to and conditions offered by Worker Compensation Board
- Improve access to proactive independent psychological help
- Provide more flexible options for return to work
- Train workers before they are involved in a fatal incident

Information Gap: Harris

- Gap regarding evaluation of strategies in reducing the negative impacts on train crews after a fatality.
- Strategies:
 - Pre-incident training for crew and supervisors
 - Comprehensive Critical Incident Response implemented and well known at all levels of the organization
 - Clear roles and expectations
 - Compulsory 3 days off
 - External evaluation of fitness to work
 - Proactive offer to help and support from employer
 - Incident management on site to help reestablish a sense of control for the crew (someone is clearly in charge to their advantage in a situation of absolute helplessness and vulnerability)
 - Comprehensive support to supervisors
 - Involvement of the employee and outside evaluator in the return to work process

Research Literature Recap: Philbrick

- **Article**: *Railroad implemented countermeasures to prevent suicide: Review of public information*
 - Addressed the prevention of rail suicide using education and training; organizational and procedural factors, and technology-related countermeasures.
 - These countermeasures were designed to improve practices and procedures, deter access, and influence behavior.
 - Premise: A range of suicide prevention strategies, including fencing, signage, detection and monitoring, training of employees and authorities, public and industry events, websites, and media guidelines have been shown to help prevent incidents.

Research Literature Recap: Philbrick

- **Article**: *Railroad implemented countermeasures to prevent suicide: Review of public information: (CONTINUED)*

Main Takeaways:

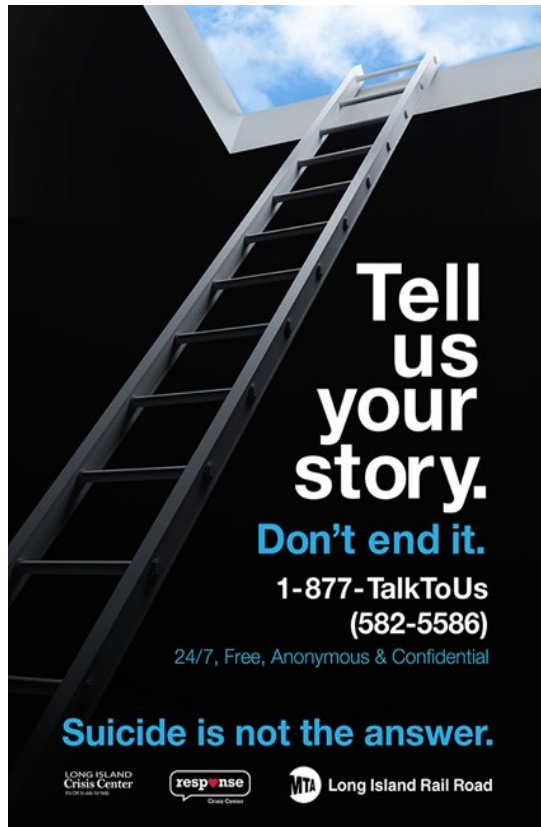
- This review revealed many instances where rail carriers' efforts to mitigate suicide are publicly discussed, either by the carrier itself or through the media.
- In total, 14 carriers and a range of strategies were identified. Overall, it is noted that talking about a safety issue, including mental health, is a proven strategy to increase safe behaviors.
- **Note**: At this time, there is a discrepancy between safety messages and suicide prevention messages, suggesting that efforts could be made to increase the confidence of rail carriers in talking about suicide. A variety physical and technical barriers (e.g., fencing, drones, signage, etc.) have documented effectiveness.

Information Gap: Philbrick

- While some articles note the impact of rail suicides on safety and service, relatively few articles noted the grave impact of these events on train crews.

Suicide Prevention Messages: Philbrick

LIRR Message



Caltrain Message



Research Literature Recap: Rose

Recommended study:

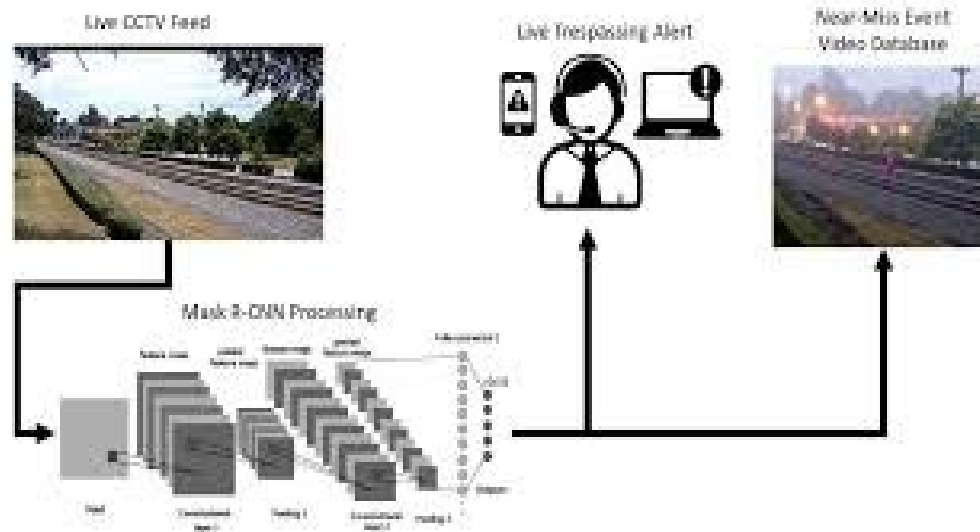
- *“AI-Aided Automated Detection of Railroad Trespassing”*

Main Takeaways:

- Many railroads/transit systems are installing cameras along ROW and around stations
- These video feeds can be a “big data” source
- This study developed an artificial intelligence (AI) algorithm that recognizes trespassing events in real time
- Coupled with a live alert system, this AI algorithm can turn video feeds into actionable, real-time alerts for ROW owners and law enforcement

Information Gaps: Rose

- The AI Automated Detection system has been tested on 2 stretches of freight/intercity passenger rail in VA & NC
- Need a larger-scale, single-system test – a closed system (e.g., rail transit) would be ideal
- Technology shortcoming: AI cannot distinguish between authorized track workers and trespassers



Overall Key Takeaways

Technology	Education/Training	Organizational/Procedural
Use monitoring technologies (remote sensing, motion detectors, video feed) to detect trespassers and individuals circumventing barriers	Invest in railroad employee training on suicide awareness and warning signs	Encourage help seeking: Suicide help phones and signs
Use Physical Barriers	Provide rail safety awareness training for mental health institutions in vicinity of tracks	Engage community around the railroad for a more focused suicide prevention program to be tailored to high-risk groups
		Encourage responsible media reporting of suicide through guidelines for journalists
		Provide comprehensive critical incident response for train crew support

Overall Information Gaps

- The impact of rail suicides on train crews needs to be studied
- Gap regarding evaluation of strategies in reducing the negative impacts on train crews after a fatality
- More comprehensive study needed on video feed Artificial Intelligence algorithm

Next Steps

- Synthesize Literature Reviews
- Continue to Identify Information Gaps
- Collect Data on Current Technologies & Processes
- Collect Data on Emerging Technologies



Questions?