

2020 FTA Joint State Safety Oversight and Rail Transit Agency Virtual Workshop

October 6-8, 2020



U.S. Department
of Transportation

**Federal Transit
Administration**

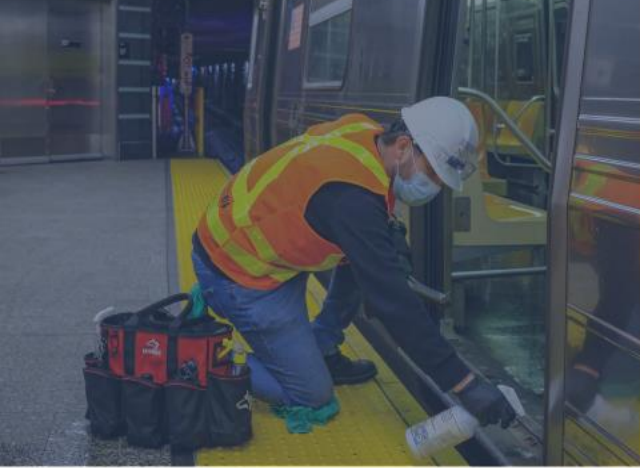


U.S. Department of Transportation
Federal Transit Administration

Transit Advisory Committee for Safety (TRACS) Recommendations for Innovations in Transit: Trespass and Suicide Prevention

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Trespass and Suicide Prevention Subcommittee

Subcommittee Members:

- Joyce Rose (Team Lead), WSP USA
- David Harris, New Mexico DOT
- Jeffrey Lau, Bay Area Rapid Transit
- Karen Philbrick, PhD, Mineta Transportation Institute
- Michael Coplen (Public Participant), TrueSafety Evaluation, LLC

Summary:

- Trespassing and suicide account for >70% of fatalities on U.S. passenger and freight rail systems regulated by FRA – average of 733 deaths/year
- On rail transit systems, the highest risk of fatality is associated with members of the public who trespass on the rail system or attempt suicide
- TSP Subcommittee developed 7 recommendations focused on technologies and innovative practices to prevent/mitigate trespass and suicide on rail transit systems

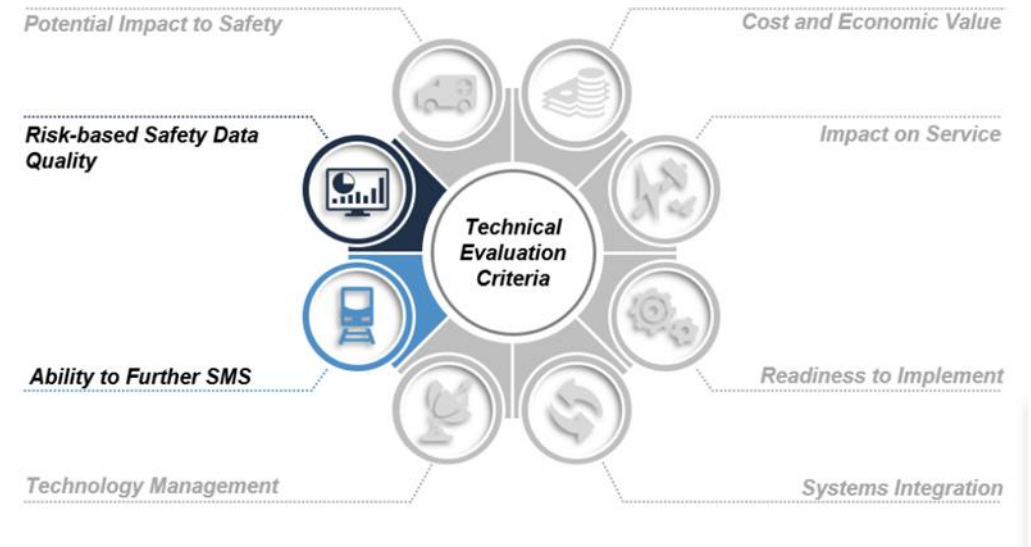
TSP Recommendations – FTA should:

1. Work with FRA to align how they define and report trespass and suicide incident data
2. Pilot a comprehensive transit-specific Post-Fatality Support Program for transit employees
3. Develop standard signage for prevention of trespassing and suicide hotlines
4. Support research/funding on detection technologies such as aerial photography and drones
5. Support building low-cost barriers such as landscaping, fencing, and anti-trespass panels
6. Research AI technologies for use in trespass and suicide detection and prevention
7. Develop proof of concept for emerging trespass and suicide prevention technologies

Recommendation #1 – Align FTA and FRA Trespass and Suicide Data Definitions and Reporting

Key Takeaways

- Rail trespassing and suicide data cannot be consolidated or compared between FTA- and FRA-regulated rail systems
- Transit agencies may operate both rail transit and commuter rail systems with duplicative and sometimes conflicting data definitions and reporting requirements
- Different data definitions and reporting requirements can create roadblocks to effective FTA/FRA interagency collaboration



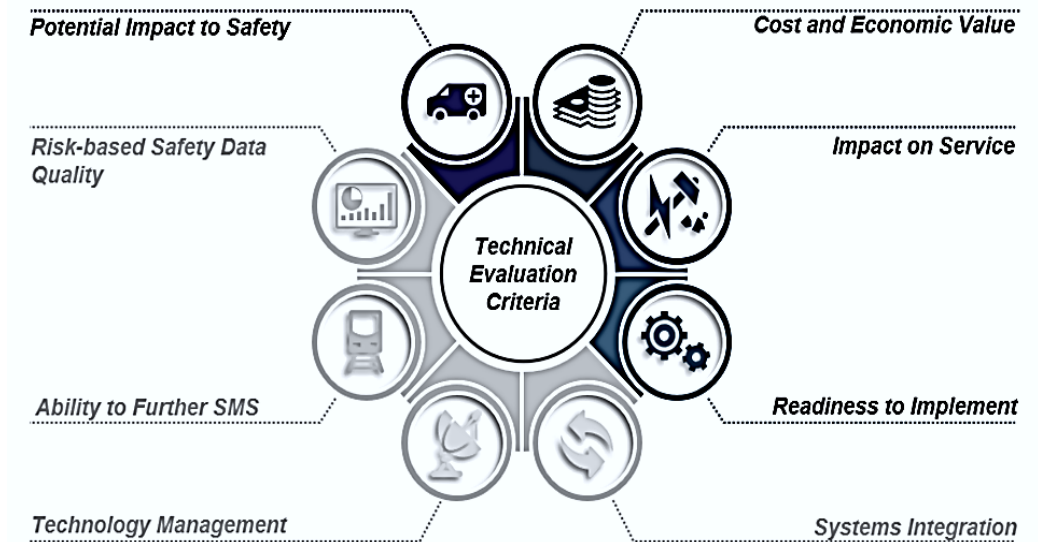
Conclusion

This recommendation supports more consistent and accurate data reporting, trend tracking, risk assessment, and determining effectiveness of mitigations

Recommendation #2 – Provide Comprehensive Post-Fatality Support for Employees

Key Takeaways

- More than half of rail operators are likely to be involved in a trespass or suicide incident
- Traumatic exposure increases likelihood and severity of impairment to emotional/physical health and cognitive functioning



Information Gaps

- Rail carriers under FRA Critical Incident Rule (49 CFR Part 272) have existing critical incident support programs, are there similar programs in transit systems?
- Need to explore issues of integrating post-fatality support with current EAP and Occupational Health programs; Training delivery; Labor/Management cooperation
- How can effectiveness of post-fatality support programs be measured?

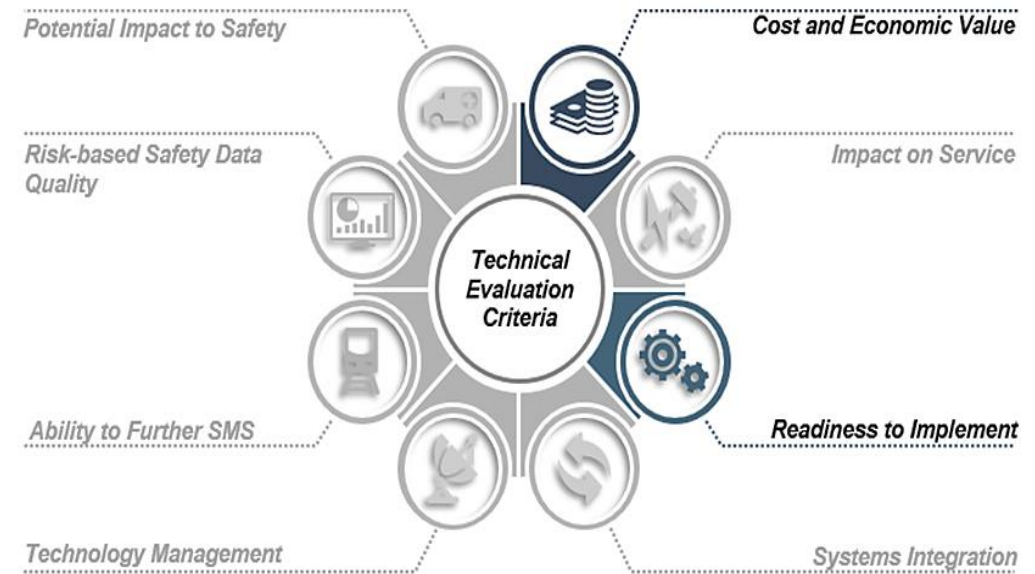
Recommendation #3 – Develop Standard Suicide and Trespass Prevention Signage

Key Takeaways

- Current suicide prevention efforts and other rail safety signage on transit systems use a broad range of strategies and information
- More than 3 times as many men commit suicide on rail lines as women – targeted message important

Information Gaps

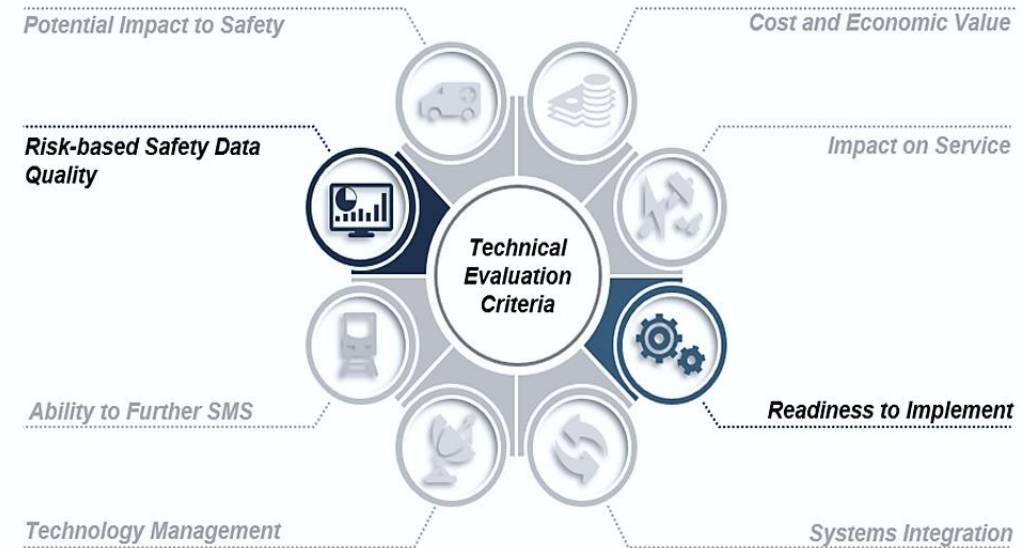
- Lack of information on the efficacy of signage as a countermeasure
- Lack on consensus on standard messaging/language that will be effective
- Lack of outcome data on how often suicide prevention numbers are called in a rail setting
- FTA could establish a national committee/working group to develop effective standardized messaging and signage (FTA, FRA, transit, SSOAs, OLI, NSC, suicide prevention groups)



Recommendation #4 – Support Research on Detection Technologies to Identify Hotspots

Key Takeaways

- Detection technologies such as aerial photography or drones can provide geographically specific data on where and when trespassing occurs
- Data gathered with detection technologies can be used to build a system that cross-reference trespass and suicide data and identifies hotspots
- Cost effective, does not require infrastructure or system changes



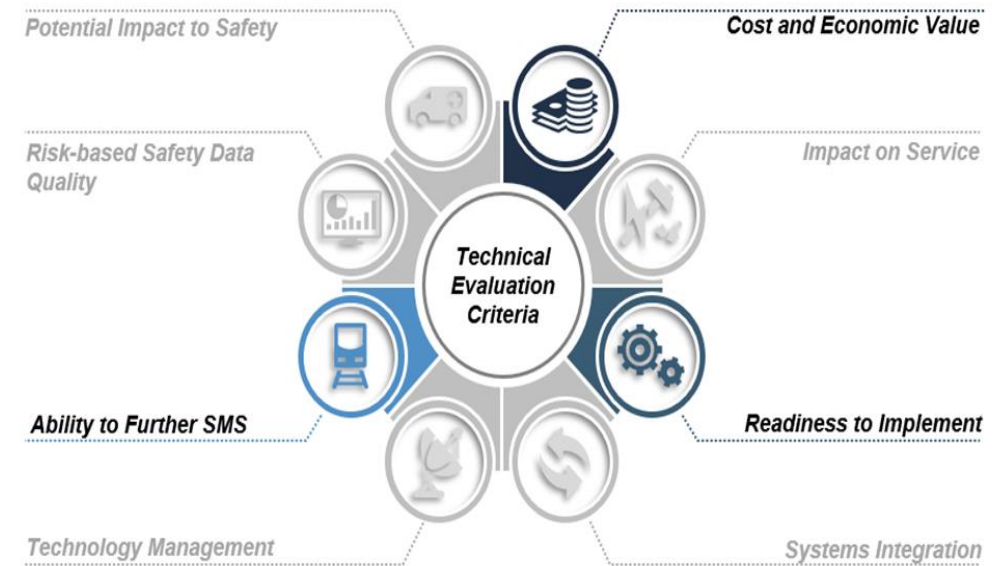
Information Gaps

- Not enough research has been conducted over a substantial period to document whether these detection technologies are effective at supporting trespass or suicide prevention

Recommendation #5 – Support Building Low-Cost Barriers and Signage Around Railroad ROWs

Key Takeaways

- All studies reviewed by the TRACS committee regarding use of barriers found them to be effective in reducing trespassing and suicide
- Low-cost barriers such as landscaping are almost as effective as fencing; signage is somewhat effective
- A recent barrier solution technology is Anti-Trespass Panels, which sense weight on the panel and relay the information to control center, as well as creating a ground-level barrier to passage
- All barriers are most effective at critical locations/ hotspots



Fencing	Landscaping	Signage
94.6% reduction	91.3% reduction	30.7% reduction

Source: Silla and Luoma, "Effect of three countermeasures against the illegal crossing of railway tracks", 2011

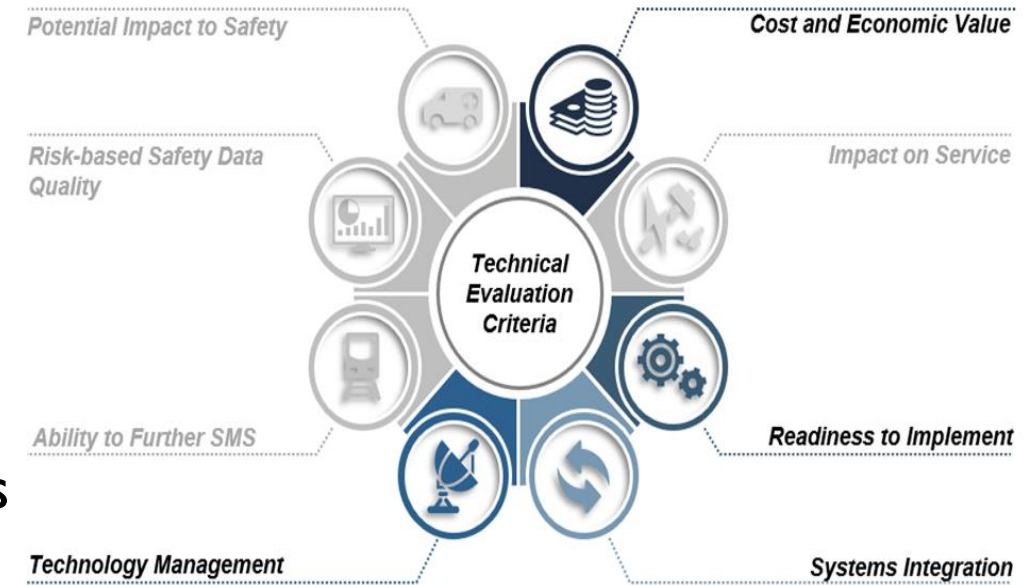
Recommendation #6 – Research Artificial Intelligence Detection and Prevention Technologies

Key Takeaways

- AI uses algorithms to convert huge amounts of data into actionable intelligence
- AI in transit systems can be built around existing CCTV and other video systems
- AI algorithms are built by establishing libraries of actions and behaviors that are associated with trespass and suicide – lengthy and expensive process
- AI-based detection of trespass/suicide behaviors can be analyzed and relayed to controllers in real time

Information Gaps

- Limited research on AI-driven video analytics, vast data sets required to predict behavior
- Reliability of detection, ability to distinguish between authorized workers and trespassers



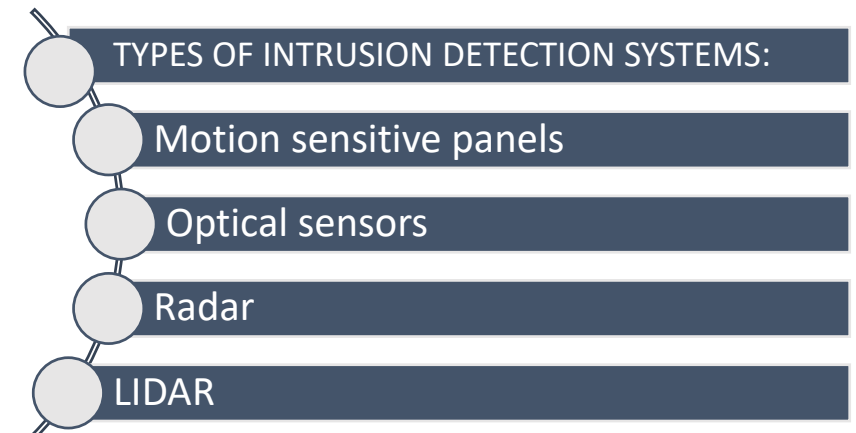
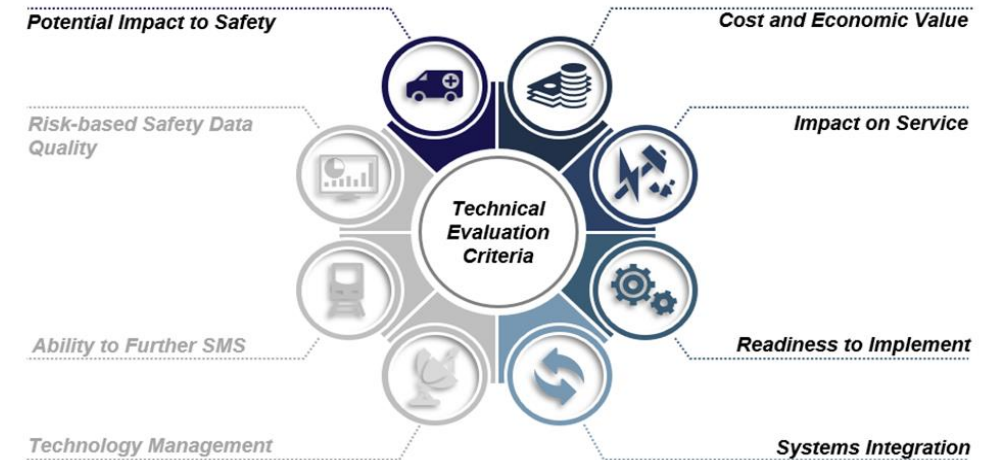
Recommendation #7 – Support Proof of Concept Research on Emerging Technologies

Key Takeaways

- Proof of concept research is recommended for 3 emerging technologies, in order of readiness:
- Systems that detection intrusions on ROW
- Systems that communicate intrusion alerts to train control systems (such as RWP)
- Systems that integrate intrusion alerts with existing protection systems such as PTC

Information Gaps

- Need compilation report of track and guideway intrusion detection systems currently in use
- Research needed to demonstrate integration of intrusion detection with RWP system





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