Measure Name Anti-trespass panels

Definition Panels installed alongside and across the tracks that make footing unreliable to deter and delay entry to the railroad right-of-way.

Tags

Incident Type	Both trespass and suicide
Location	Both station and right-of-way
Intervention Strategy	Engineering: technological and physical deterrents
Measure Group	Physical Barriers

Description

Anti-trespass panels are used to restrict access to the Right-Of-Way (ROW) from grade crossings and other potential entry points to the tracks. These panels are made from recycled rubber or timber and have a surface that is difficult to walk on. Panels can have a repetitive skewed profile or a raised pyramid design.

Anti-trespass panels are most effective when combined with proper channelization to prevent people from walking around the panels. They can also be effective at tunnel or bridge locations where there is natural/infrastructure channelization. These panels are often found at the end of a platform to prevent people from using the railroad ROW as a shortcut or intentionally putting themselves in front of a train.

Anti-trespass panels have helped reduce railroad trespasser activity, according to evaluations of panel effectiveness, including one evaluation in the United States. The U.S. study reports a 38-percent reduction in the number of trespassers following the installation of the anti-trespass panels at a crossing in Fayetteville, AR [1]. Other research studies conducted in Europe evaluate the effectiveness of anti-trespass panels in combination with other physical and behavioral measures. These studies reported between a 30- and 98-percent reduction in the number of trespassers following installation of the panels [2][3][4].

Additional search terms: *deterrent, grids, pyramids*

Advantages

- Anti-trespass panels are simple to install [2].
- The panels are made of rubber and can be cut to fit around existing infrastructure (e.g., columns, signs).
- Panels are relatively low cost. The cost is primarily associated with the materials, as the panels may be installed by rail staff.
- Unlike rock treatments, where installation is only outside the tracks, installation for anti-trespass panel can also be between the rails.
- Panels can be both a visual and physical deterrent [4].

- Panels can be used to mitigate both trespass and suicide incidents on the ROW and at stations.

Drawbacks

- Anti-trespass panels can make it difficult for railroad maintenance workers and first responders to access the railroad ROW.
- Anti-trespass panels can make it more difficult for passengers to exit the railroad ROW during an emergency evacuation.
- Without proper upkeep, anti-trespass panels can fill up with dirt, fallen debris, or snow, reducing their effectiveness.
- It may be possible for an individual to become stuck on the tracks if they entered the right-of-way elsewhere and try to exit at a location with anti-trespass panels [5].

Notable Practices

- Consider the potential for individuals to attempt to jump over the panel when determining the width of the panel needed [1].
- Consider adding snowplow lift signs near the panels if installed in snowy areas to reduce the occurrence of damage during snowplowing [2].
- Consider safety and operational impacts on train and roadway users when scheduling panel installation.
- Develop a maintenance strategy to remove dirt, fallen debris, and snow from the panels and consider the weight of the panels when removing them for cleaning [5].
- Reflective paint can increase a panel's visibility on the ground [4].
- Ensure that there are escape routes around panels for train passengers during emergency evacuation [4].
- Consider adding entry gates along the fence for railroad workers or first responders to access the railroad ROW [4].
- Post warning and prohibitive signs near the panels.
- Create proper channelization along the railroad ROW so that people cannot walk around the panels.
- Collect trespass frequency before and after panel installation at each location to help evaluate effectiveness.

References

[1] Ngamdung, T. and DaSilva, M. (2019). *Effect of Anti-Trespass Guard Panels on Pedestrian Behavior.* Technical Report No. DOT/FRA/ORD-19/23. Washington, DC: U.S. Department of Transportation, Federal Railroad Administration.

Abstract: The U.S. Department of Transportation's (DOT) John A. Volpe National Transportation Systems Center (Volpe Center), under the direction of DOT's Federal Railroad Administration Office of Research, Development and Technology, conducted a research study that evaluated the effectiveness of anti-trespass guard panels installed on a railroad right-of-way (ROW) adjacent to the West Dickson Street grade crossing in Fayetteville, AR. The goal of the panels was to reduce the number of pedestrians that trespass onto railroad ROWs. Data was collected over 10 weekends before and another period of 10 weekends after the installation of the anti-trespass guard panels. Results indicated that the number of trespassing pedestrians was reduced by 38 percent, from 166 trespassers before installation to 103 after installation. Though these results seemed to indicate that this safety enhancement was effective in improving pedestrian behavior, it is important to note that no measure of pedestrian traffic was collected, and this safety enhancement has only been studied at one unique crossing. Additional field testing is necessary before recommendations for wider use can be made.

[2] Svensson, K. and Dahlstrand, A. (2019). *Pyramid Rubber Mats Obstructing Rail Track Trespassers*. The Swedish Transport Administration.

Description: This report describes a study, conducted by Swedish Transport Administration, to evaluate the effectiveness of anti-trespass panels installed at six test site locations throughout the rail network in Sweden. The test site locations include three at rail yard, one at grade crossing, one at tunnel, and one at station platform. The report includes data on the effects of anti-trespass panels on the number of trespassers at these locations.

[3] RESTRAIL. (2014). *Evaluation of measures, recommendations and guidelines for further implementation: Pilot test #7, A combination of measures at Ayden Station – TCDD*.

Description: This document describes a pilot test of various physical and behavioral measure including anti-trespass panels to reduce the occurrence of suicides and trespasses on railway property as part of the RESTRAIL project.

[4] RESTRAIL. (2020, September 30). *8.5 Anti-trespass panels*. Restrail Toolbox.

Description: This webpage provides information on implementing anti-trespass panels in Europe, including recommendations, considerations for implementation, and relevant research results.

[5] Warner, J. E., Lee, D., Trueblood, A. B., Cline, J. C., Johnson, N. A., & Christjoy, A. (2022). Strategies for deterring trespassing on rail transit and commuter rail rights-of-way, volume 1: Guidebook. *Washington, D.C: The National Academies Press.*

Objective: This guidebook is intended to provide information on strategies to deter trespassing on rail transit and commuter rail exclusive and semi-exclusive rights-of-way, including within station areas outside designated pedestrian crossings. In general, trespassing is accessing rail transit and commuter rail restricted areas without permission or proper authorization, intentionally or unintentionally. The guidebook documents the extent of trespassing in the United States; existing decision-making guidance that agencies can utilize; causes, consequences, and risks associated with trespassing; mitigation countermeasures to reduce trespassing risks; and tools that agencies can utilize to identify possible mitigation strategies for a particular trespassing problem or concern.

Additional Resources

Metrolinx. (2019, September 26). *Metrolinx is exploring innovative ways to reduce deaths on our tracks.*

Description: This news article describes an effort by Metrolinx in Canada to increase safety along its ROW by installing the anti-trespass panels at high-risk locations.

Related Measures

- Fencing between tracks at stations
- Identify funding opportunities
- Incident cost estimation
- Landscaping treatments to restrict access
- Physical barriers at bridges
- Right-of-way fencing