Measure Name: Sidewalk pavement treatments

Definition: Sidewalk pavement markings and tactile surfaces to warn pedestrians of upcoming grade crossing.

Tags:

Type of Incident:

- ☒ Non-Motorized Users Only
- ☐ Motor Vehicles Only
- ☐ Both

Intervention Strategy:

- ☐ Data: application and planning
- ☐ Education: outreach and messaging
- ☐ Enforcement: policy development and rulemaking
- ☒ Engineering: technological and physical deterrents

Type of Problem:

- ☒ Non-Motorized Users Violating Warning Devices
- ☐ Motor Vehicles Violating Warning Devices
- ☐ Vehicle ROW Incursion
- ☐ Vehicle Congestion
- ☐ Blocked Crossing
- ☐ Vehicle Hang-up

Measure Category:

- ☐ Risk Assessment
- ☐ Policy and Enforcement
- ☐ Collaboration, Training, and Education
- ☐ Public Communication
- ☐ Physical Barriers
- ☐ Detection and Lighting
- ☒ Infrastructure Modification
- ☐ Post-Incident Management
- ☒ Warning Devices

Description

Sidewalk pavement treatments refers to the installation of painted warning messages or detectable warning surfaces on a sidewalk leading up to a grade crossing. Painted warning messages can be used effectively to remind hurried passengers of the need to be wary of trains approaching on any track and in either direction [1]. Detectable warning surfaces, which consist of raised truncated domes, installed on approach sidewalk to a grade crossing alerts visually impaired pedestrians of the presence of a crossing. Without these, a visually impaired pedestrian's first tactile cue to the presence of a crossing may be the track itself.

Sidewalk pavement treatments should be considered for all grade crossing locations, and especially those where pedestrians regularly violate the warning devices.

Additional search terms: *stop line, warning sign, tactile mats, tactile strips, detectable warning surface*

Advantages

- Pavement markings and detectable warning surfaces are a low-cost measure. [2]
- Detectable warning surfaces that contrast visually with adjacent walking surfaces, either light-on-dark or dark-on-light, can be used to warn pedestrians about the locations of the tracks at a grade crossing. [3]

Drawbacks

- These treatments require ongoing maintenance. [2]
- Snow and ice will lessen their safety benefit. [2]
- Rain can make markings difficult to see. [2]
- Pavement markings and tactile surfaces are assumed to be effective, but their effect has not yet been quantified. [2]

Notable Practices

- FRA recommends that when such pavement marking warning messages are used, the pavement marking should extend the full width of the pathway or sidewalk, so as to maximize the conspicuity and applicability of the warning message. [1]
- The U.S. Department of Justice 2010 ADA Standards for Accessible Design, September 15, 2010, 28 CFR 35 and 36, Americans with Disabilities Act of 1990 contains specifications for the design of detectable warning surfaces. [3]

- If used at pathway or sidewalk grade crossings, the stop line should be a transverse line that extends across the full width of the pathway or sidewalk at the point where a pathway or sidewalk user is to stop. [3]
- The near edge of the detectable warnings should be located no less than 12 feet from the nearest rail and be at least 2 feet in depth. [4]
- The detectable warning should extend 24 inches in the direction of travel covering the full width of the designated pedestrian pathway. In addition, the edge of the detectable warning surface closest to the track should be located next to the warning sign or device, but no closer than 12 feet from the nearest rail on either side of the crossing. [1]
- A stop line should be provided at a pathway crossing if the surface where the marking is to be applied can retain the application of the marking. [4]
- Detectable warnings should be used at pathway crossings where pedestrian travel is permitted and at sidewalk crossings and should extend across the full width of the pathway or sidewalk. [4]
- Detectable warnings should be placed immediately in advance of the pathway or sidewalk stop line (if present). [4]
- Where the distance between the center line of two tracks exceeds 38 feet, additional detectable warnings, designating the limits of a pedestrian refuge area, should be used at sidewalks or pathway crossings. [4]

References

[1] US Department of Transportation Federal Railroad Administration. (2012). Guidance on Pedestrian Crossing Safety at or near Passenger Stations.

> Excerpt: FRA has intended this guidance primarily for both passenger railroads and freight railroads that operate trains over trackage that also supports passenger operations. The presence of pedestrians within station areas and moving toward or across tracks to access station platforms can create numerous potential conflict areas where pedestrian movement must be restricted once an approaching train is detected.
>
> This guidance is also intended to provide railroads, as well as State and local agencies and other stakeholders, with strategies and methods that can help them to prevent pedestrian incidents and fatalities specifically in areas within or near passenger stations.

[2] Transportation Research Board. (2009). TCRP Report 137: Improving Pedestrian and Motorist Safety Along Light Rail Alignments.

> Excerpt: TCRP Report 137: Improving Pedestrian and Motorist Safety Along Light Rail Transit Alignments addresses pedestrian and motorist behaviors contributing to light rail transit (LRT) safety and describes mitigating measures available to improve safety along LRT alignments.

[3] Federal Highway Administration. (2023). Manual on Uniform Traffic Control Devices.

> Excerpt: The purpose of the MUTCD is to establish uniform national criteria for the use of traffic control devices that meet the needs and expectancy of road users on all streets, highways, pedestrian and bicycle facilities, and site roadways open to public travel.

[4] U.S. Department of Transportation. (2019). Highway-Rail Crossing Handbook – Third Edition.

Abstract: The purpose of the Highway-Rail Crossing Handbook, 3rd Edition is an information resource developed to provide a unified reference document on prevalent and best practices as well as adopted standards relative to highway-rail grade crossings. The handbook provides general information on highway-rail crossings; characteristics of the crossing environment and users; and physical and operational changes that can be made at crossings to enhance the safety and operation of both highway and rail traffic over such intersections. The guidelines identified and potential alternative improvements presented in this handbook reflect current best practices nationwide

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Additional Resources

California Public Utilities Commission. (2008). Pedestrian-Rail Crossings in California.

Excerpt: This document reviews design and placement of warning devices that are currently used at pedestrian-rail at-grade crossings in California.

Related Measures

- Automatic pedestrian gate
- Pedestrian channelization

Images

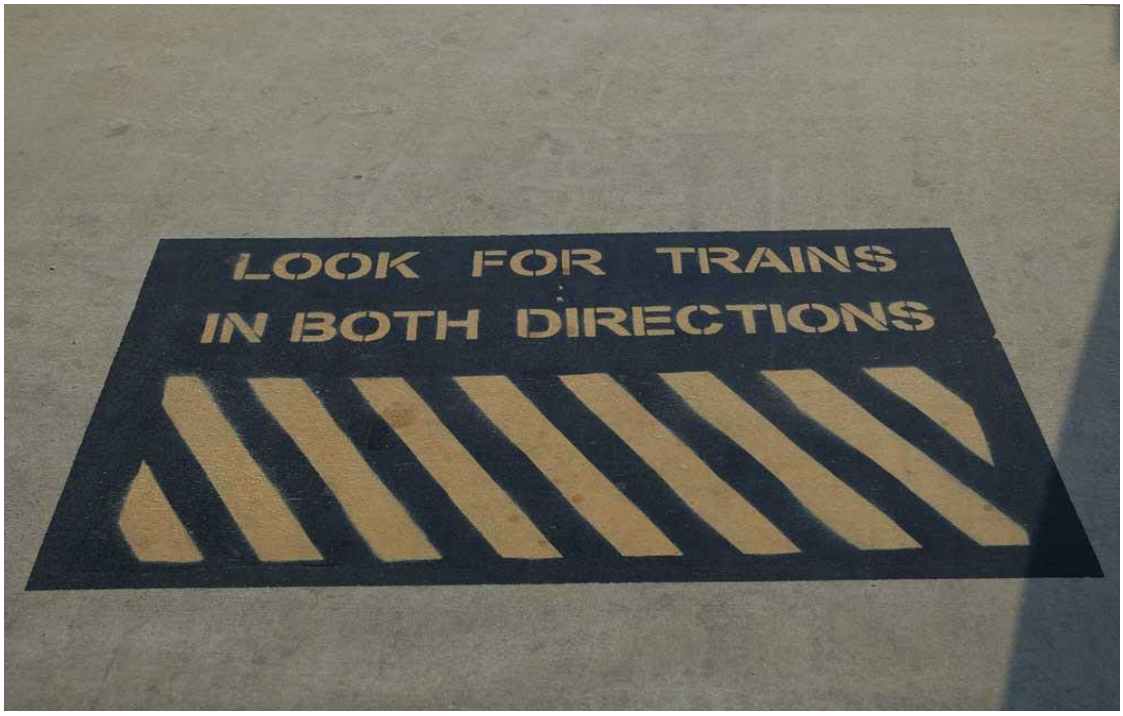

Figure 1. Example of a painted warning message on a sidewalk at a crossing
Image Credit: Volpe Center

Figure 2. Example of a painted warning message on a sidewalk at a crossing
Image Credit: FRA

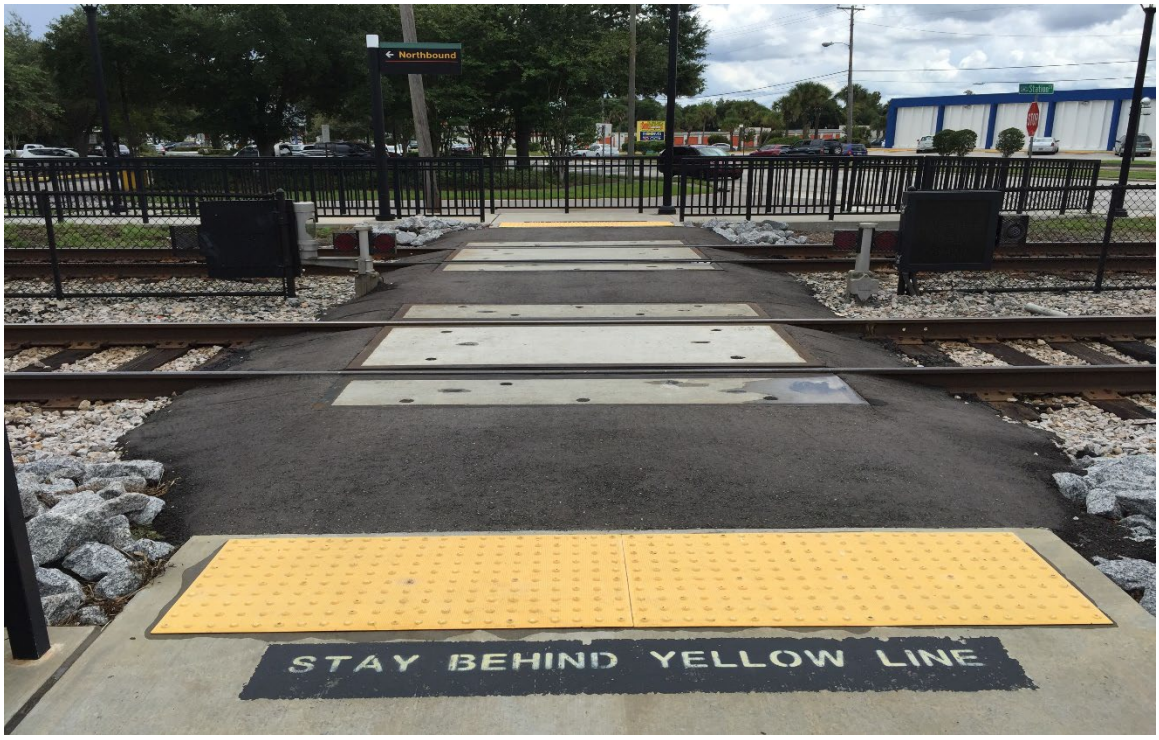

Figure 3. Example of tactile mats on a sidewalk at a pedestrian crossing in Orlando, FL
Image Credit: Volpe Center

Figure 4. Example of painted STOP on a sidewalk at a crossing in Sandy, UT from Google Street View

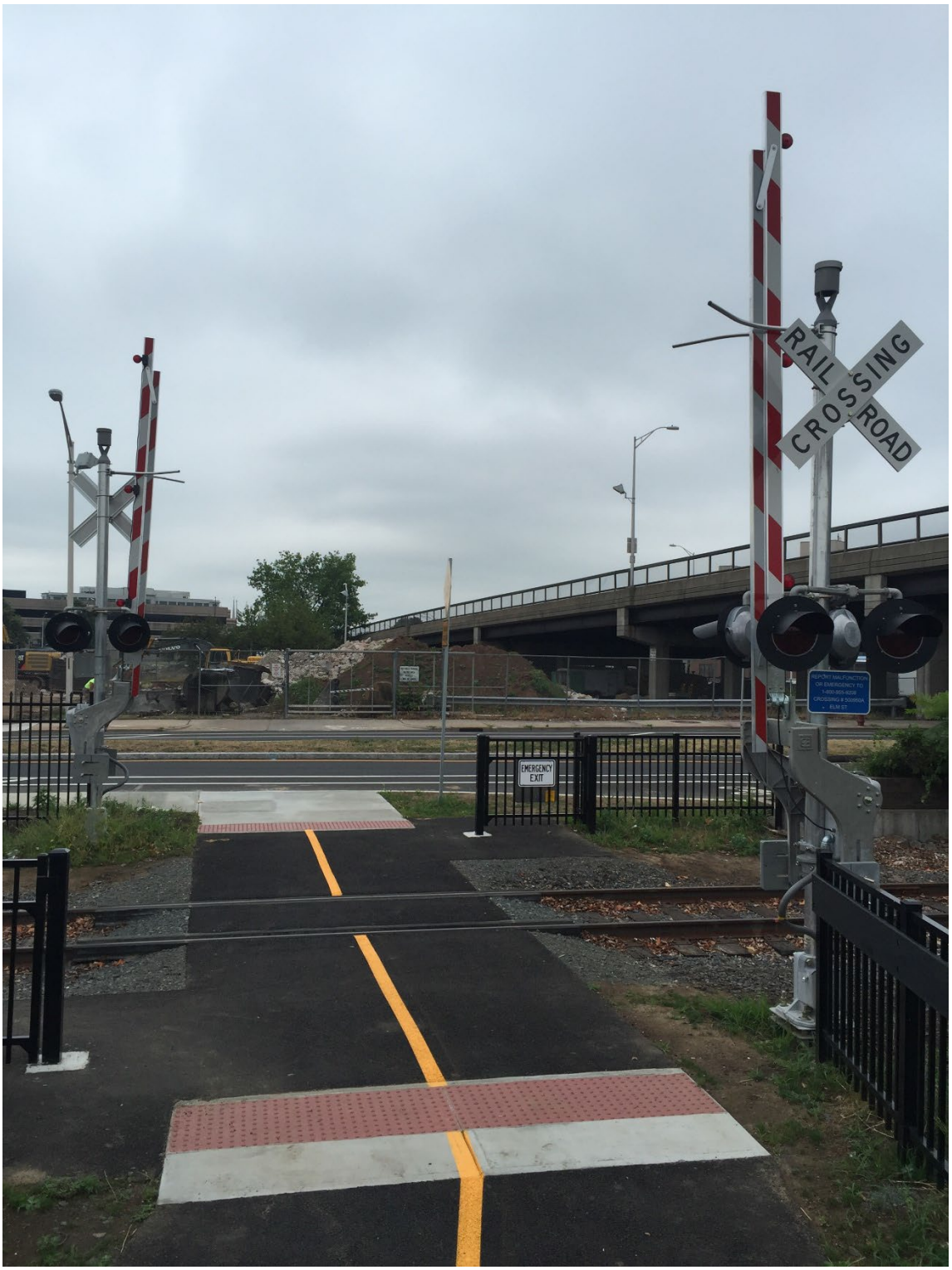

Figure 5. Example of tactile mats at a pathway crossing in New Britain, CT
Image Credit: Volpe Center