

**Measure Name:** Pedestrian violation audio warning

**Definition:** Installation of a motion-activated pedestrian grade crossing violation warning system.

**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

Pedestrian violation audio warning refers to the installation of motion-activated audio messages to warn pedestrians that violate activated grade crossing warning devices. Upon activation of the grade crossing warning devices, a sensor detects a passing pedestrian and triggers a pre-recorded audio message. The objective of the measure is to detect a pedestrian grade crossing violation and provide an aural warning to deter the violator from traversing the tracks.

Research indicates that this measure provides a positive safety benefit to pedestrian compliance with crossing warning devices. It has been shown to raise awareness and change risky behavior at activated grade crossings. One study in Belgium recorded a decrease of between 30-70 percent of horizontal gate violations across 5 crossings in which a system was evaluated [1]. Additionally, it is an effective way to warn vision-impaired pedestrians [2]. Pedestrian violation warning devices should be considered for crossings in locations with high volumes of pedestrian traffic and at crossings near train stations [2].

Additional search terms: *gate arm, barrier, warning, pathway*

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## Advantages

- Pedestrian violation audio warning devices have been shown to change risky behavior at activated grade crossings. [1]
  - Pedestrian violation audio warning devices are an effective way to warn vision-impaired pedestrians. [2]
  - System can be designed as a mobile unit that can be moved to different high-risk crossings. [1]
  - System does not have to be connected to grade crossing circuitry. [1]
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## Drawbacks

- Measure may not be effective in noisy environments, or if a train is approaching. [2]
  - There is the potential for noise pollution. [1]
  - Measure will require regular maintenance, inspection, and testing.
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## Notable Practices

- The motion sensor needs to be sufficiently close to the approach paths so that it correctly detects the presence of passing pedestrians. [2]
- The system can use an angle measuring sensor on the grade crossing gate counterweight to detect gate movement and activate the system, thereby eliminating need to connect to grade crossing circuitry. [1]

- The warning system should be deactivated when the gate arm is in the ascending phase, at least once it gets past 45 degrees. [1]

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## References

[1] Godeau, V., [Warning Box: Presentation of Pilot Project Results](#). International Level Crossing Awareness Day Conference. June 8, 2022.

Excerpt: Warn (by means of an acoustic signal) vulnerable LC users that they are committing a violation by crossing a closed (or closing) LC.

[2] Victoria, Australia Department of Infrastructure. (2003). [Rail Crossing Disability Access Toolkit](#).

Excerpt: This Toolkit presents a range of treatments for enhancing safety for people with disabilities at rail crossings.

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## Additional Resources

The Brussels Times (June 20, 2024). [Infrabel installs Warning Box to improve safety near Pairi Daiza](#).

Excerpt: The Warning Box is a mobile device that triggers an audible alarm when someone attempts to cross a closed railway level crossing. As the barrier descends, a transmitter sends an infrared LED beam towards a receiver on the other side of the roadway. An infraction interrupts the LED beam, causing a three-second alarm to sound, accompanied by a voice message encouraging the user to refrain from crossing the barrier. Since 2020, this system has been deployed in several municipalities in Wallonia and Brussels, and according to Infrabel, it has deterred half of the potential offenders.

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## Related Measures

- Automatic gates
- Automatic pedestrian gate
- Gate skirts
- Long arm gate

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## Images

- No image available