

Measure Name: Complete open/close cycle

Definition: Adaptation of a grade crossing control system to avoid partial opening when multiple consecutive trains travel through a 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

A complete open/close cycle refers to the adaptation of a grade crossing control system to avoid partial opening when two or more trains consecutively travel through a crossing. The trains can be traversing the crossing in either the same direction or in opposite directions [1]. A complete open/close cycle can improve safety at a crossing by eliminating the potential confusion of a crossing gate partially opening but then immediately closing again [1].

Complete open/close cycles are often used at grade crossings near stations. The measure may be desired at crossings at far-side stations, where a train passes through a grade crossing before stopping at a nearby station. If a second train approaches on the opposite track at a far-side station, the gate should remain fully closed until both trains have fully departed the crossing. At near-side stations, where a train passes through a station before the grade crossing, it can be preferable to have the gate remain fully closed while the train is in the station if the station is very close to the grade crossing [2].

Additional search terms: *two trains, partial opening, gates swinging, gate malfunction*

Advantages

- Can improve safety at grade crossings by avoiding confusion of a gate partially opening. [1]
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Drawbacks

- Can result in long delays to drivers, especially on high density rail lines. Very long delays may encourage violation of warning devices. [1]
 - Modification of systems to enable this capability can be expensive.
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Notable Practices

- Users should be informed about the implementation of this measure. [1]
 - Agencies should consider this measure in conjunction with a sign indicating “two trains”. [1]
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References

[1] SAFER-LC. (2019, May 9). [Complete Open/Close Cycle](#).

Description: This webpage provides information on implementing complete open/close cycles on the approach of level crossings in Europe, including benefits, criticalities, recommendations, and results of relevant studies.

[2] Southern California Regional Rail Authority (2021, January). [SCRRA Highway-Rail Grade Crossing Manual](#), p.92-93.

Excerpt: This Manual was developed in 2009 and issued as a Recommended Design Practices and Standards Manual.

Additional Resources

Related Measures

- Constant warning time detection
 - Second train warning
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Images

- No image available