

Measure Name: Improved data collection after an incident

Definition: Develop policies and procedures for collecting post-incident data to improve grade crossing incident risk assessment and mitigation.

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

After a train strike, stakeholders work together to expedite a response and resume operations. During this time, an initial investigation takes place to gather information that rail carriers and local communities can use to better understand how the incident occurred and the factors involved. These factors are critical for risk assessment efforts and to help inform effective future mitigation strategies. It can also help to answer questions such as: Why this grade crossing, time of day, and this individual? What characteristics of the location made it difficult to anticipate the likelihood of this incident?

When a train strike occurs at a grade crossing, railroads may benefit from collecting additional information to gain a better understanding of these incidents. These factors include, but not limited to three types of information [1]. First, the number of fatalities and any characteristics available for the individual(s) involved, including demographics. Second, the description of the location including lighting, roadway type, number of lanes, alignment, route type, and posted speed limit. Third, information about the vehicle including the actions and impairment of the driver, prior movement, rollover, and vehicle body type. Additional information may include supplemental safety measures in use at the crossing, delays to the roadway and rail systems.

To ensure that information is collected systematically, policies and procedures should be coordinated between all parties, including the rail carrier, police and other emergency responders, and the coroner/medical examiner office. Well-defined roles and responsibilities enable data collection to be more efficient and complete, allowing for a more in-depth understanding of these incidents and ways to mitigate them. It is important that the investigation be both thorough and efficient to expedite the restoration of service in a timely manner.

Information collection can include various forms from the Federal Railroad Administration (FRA) as well as forms internal to the rail carrier. Observations and statements from the train crew and witnesses from the roadway traffic, as well as video footage, is essential to understand factors about the location and individual(s) involved. Data collection can also be completed during site visits by rail carrier representatives, FRA inspectors, or law enforcement by going back to the scene to recreate the progression of actions for a clearer picture.

Additional search terms: *analysis*

Advantages

- Creating and coordinating policies and procedures that delegate roles and responsibilities is relatively low cost. Actual costs will depend on the time needed to coordinate policies with the relevant parties.
- Conduct site visits to better understand how an incident occurred are also low cost and informative.
- Data collected from multiple incidents can be shared with a broader community—including other rail carriers, FRA, and safety organizations—to compare their own situation and any mitigation efforts planned, tested, and implemented in their area.

Drawbacks

- Because of U.S. privacy laws, personal health and other potentially identifying information about the victim may not be available. This lack of accessibility of information may lead to data inconsistencies when comparing across incidents.
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Notable Practices

- When creating policies and procedures, coordinate roles and responsibilities with members from each group that responds to train strikes, including the rail carrier, police (railroad and local), as well as other emergency responders and the coroner/medical examiner office.
 - Review and update policies and procedures as warranted.
 - Demographic information about the individuals involved in the incidents can be critical in tailoring mitigation efforts to the target population.
 - Information about behaviors before the train strike can be useful to understand how the person or vehicle got on the tracks in front of a moving train. This information can help inform the selection of effective mitigations. [2][3]
 - Investigations may be difficult in a chaotic situation, and data can be missed. The more standardized and thorough the data collection plan, the better the outcome for comprehensive data collection.
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References

[1] Das, S., Kong, X., Steven M. Lavrenz, Wu, L., & Jalayer, M. (2022). Fatal crashes at highway rail grade crossings: A U.S. based study. *International Journal of Transportation Science & Technology*, 11, 107-117. <https://doi.org/10.1016/j.ijtst.2021.03.002>.

Abstract: Crashes at highway rail grade crossings (HRGCs) are often involved with fatalities due to the momentum of a train. This study collected nine years (2010–2018) of fatal HRGC crashes from the Fatality Analysis Reporting System (FARS) to perform the analysis. The Taxicab Correspondence Analysis (TCA) was applied to this dataset. This method identified several patterns that trigger HRGC-related fatal crashes. The findings indicate that fatal crashes involving multiple fatalities are often highly associated with alcohol-influenced drivers, poor lighting conditions, and inclement weather. The fatal crash that occurs during the daylight with the uninfluenced driver is less likely to involve more than one fatality. The results also recognized the combinations of vehicle type and speed are associated with fatal crashes at rail grade crossings. The relatively low-speed limit crossings and larger utility vehicles are more likely to be associated with fatal crashes because large vehicles require a longer time to cross railroads at a low speed. The relatively high-speed limit crossing and smaller or lighter vehicles, especially the motorcycle, are highly associated with fatal crashes.

[2] Chase, S. G., & Hiltunen, D. (2020). [Consistent Trespasser Intent Determination Criteria Pilot Project](#). Technical Report No. DOT/FRA/ORD-20/15. Washington, DC: U.S. Department of Transportation, Federal Railroad Administration.

Abstract: This document describes a pilot project that evaluated the potential for developing standardized criteria that railroads can use to determine the probable intent (i.e., suicide or accident) of individuals involved in trespasser strikes on railroad right-of-way in the United States. These criteria are designed to help railroads better understand suicide and trespass incidents that occur on the right-of-way and support the selection and evaluation of mitigation strategies. The John A. Volpe National Transportation Systems Center (Volpe) used an approach similar to the criteria implemented by the Railway Safety and Standards Board and European Railway Agency and developed a modified version of the “Ovenstone” criteria called Trespasser Intent Determination and Evaluation (TIDE). The criteria can assist railroads in making consistent internal judgments about the probable intent (i.e., suicide or accident) of an individual involved in a trespasser strike regardless of whether the outcome is a fatality or injury. The criteria includes three types of factors that can be used to make one of three determinations: probable suicide, probable accident or inconclusive.

[3] Chase, S. G., Hiltunen, D., & Gabree, S. H. (2018). [Characteristics of Trespassing Incidents in the United States \(2012-2014\)](#). Technical Report No. DOT/FRA/ORD-18/24. Washington, DC: U.S. Department of Transportation, Federal Railroad Administration.

Abstract: Trespassing is the leading cause of rail-related fatalities in the United States. A large proportion of these trespasser fatalities are from intentional acts (i.e., suicides). The John A. Volpe National Transportation Systems Center (Volpe Center) has been tasked by the Federal Railroad Administration (FRA) to examine trespasser and suicide incident data on railroad rights-of-way to provide a better understanding of the contributory factors involved in these incidents and provide recommendations of potential mitigation strategies. This document provides a baseline measure of FRA trespassing and suicide incident data from 2012 through 2014. Findings illustrate a number of environmental and individual factors that are associated with each incident, such as location (region, state, and right-of-way vs. grade crossing), time (season, month, day of the week, time of day), and characteristics of the individual (age, gender, physical act that immediately preceded the incident). Each of these factors is analyzed in the hope that they may give predictive value in the future and a better understanding of the best ways to mitigate trespasser incidents on rail.

Additional Resources

Related Measures

- Risk assessment using Closed-Circuit Television (CCTV)
 - Identify and monitor hotspots
 - Plan for expedited incident response
 - Rail corridor risk assessment
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Images

- No image available