Measure Name Improved data collection after an incident

Definition Development of policies and procedures for collecting data after an incident to improve trespass and suicide risk assessment and mitigation.

Tags

Incident Type	Both trespass and suicide
Location	Both station and right-of-way
Intervention Strategy	Data: application and planning
Measure Group	Post-incident management

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 determining the individual's intent (suicide or non-suicide), and such information can be used for risk assessment efforts and to help inform effective future mitigation strategies. It can also help to answer questions such as: Why this location, time of day, and this individual? What characteristics of the location made it more difficult to anticipate the likelihood of this incident?

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. While observations and statements from the train crew and witnesses, as well as video footage, is essential to understand factors about the location and individual(s) involved. Witnesses are not consistently available, and engineers may not always provide reliable testimony, so analyzing a recording of the collision provides the most accurate means of comprehending the circumstances and determining the cause of death [1]. 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.
- 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 larger community—including other rail carriers, FRA, and suicide prevention organizations—to compare their own situation and any mitigation efforts planned, tested, and implemented in their area.

Drawbacks

- Because of US privacy laws, personal health and other potentially identifying information may not be available. This lack on accessibility of information may lead to data inconsistencies when comparing across incidents.
- Often, medical or toxicology reports are missing from individual incidents resulting in important gaps in the knowledge about the deceased and creating limitations within the data [2].

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.
- Information about the surrounding area is helpful to identify factors that contribute to trespass and suicide incidents. For example, evidence of a convenient cut-through from a residential area to a local shopping plaza, medical outpatient facility, or other social services.
- Information about the presence or absence of any safety mechanisms, such as yield signs, fencing to prohibit trespassers, or signs and stoplights can be valuable and used to reduce the number of railroad-related fatalities [1].
- Demographic information about the individuals involved in trespassing and suicide incidents can be critical in tailoring mitigation efforts to the target population.
- Information about behaviors before the train strike can be useful to understand the intent of the individual (suicide vs non-suicide), which in turn informs the selection of effective mitigations [3] [4]. For example, was the individual seen at the same location earlier in the day? What were the individual's behaviors before impact?
- Investigations may be difficult in a chaotic situation, so data can still be missed. The more standardized and thorough the data collection plan, the better the outcome for comprehensive data collection.

References

[1] Brooks, J., Grande, A., Prahlow, J. A., & Brown, T. (2023). Medicolegal Death Investigation of railroad-related fatalities. American Journal of Forensic Medicine & Pathology, 44(3), 220–222.

Abstract: Railroad-related fatalities in the United States are increasing. A paucity of literature exists regarding the medicolegal death investigation of railroad-related deaths. We report on a subset of deaths in western Michigan, propose protocols for investigating train-related deaths, and propose a stepwise approach for the medicolegal investigation of railroad-related fatalities. Fourteen railroad-related fatalities from 2015 to 2019 were reviewed. Each case was analyzed for demographics, investigative components, train variables, and death certification. The average age was 32 years. Nine decedents involved pedestrians versus trains, and 5 involved motor vehicles versus trains. Male victims were more common, and 50% of the cases were associated with mental illness or recent stressors. Accident was the most common manner of death. With the exception of basic weather conditions, the remaining investigative variables were rarely reported. Image and audio recordings were taken in 3 cases, but railroad companies refused to allow the recordings to be viewed by the medical examiner. We conclude that in addition to a thorough medicolegal death scene investigation and postmortem examination, audio/video recordings are crucial components of death certification in railroad-related fatalities and advocate that medical examiners/coroners be given the legal right to view and retain them.

[2] Norman, H., Marzano, L., Fields, B., Brown, S., MacDonald Hart, S., & Kruger, I. (2024). Characteristics and circumstances of rail suicides in England 2019–2021: A cluster analysis and autopsy study. Journal of Affective Disorders, 354, 397–407.

Abstract: *Background:* Around 4 % of all suicide deaths in Great Britain occur on the railways. This exploratory study was designed to increase understanding of the individuals that take their lives in this way, and the circumstances of their death. *Method:* Data were obtained from fatality investigation files compiled by the British Transport Police (BTP) relating to suspected suicides on the mainline railway in England from April 2019 to March 2021. Cluster analysis was carried out to identify grouped associations of characteristics and circumstances relating to rail suicide. *Results:* A total of 436 files were analysed, representing 93 % of all suspected railway suicides during this period. Cluster analysis identified four groups of almost equal size, distinguished principally by age, living arrangements, employment status and location of death. The study is novel in the way it integrates individual characteristics and circumstances of death. The identified clusters may provide a multidimensional way of conceptualising suicide risk that could inform more targeted interventions at rail locations. *Limitations:* A high proportion of missing data means that the findings need to be interpreted with caution. It also restricted the multivariate analysis to those categories of information for which sufficient information was available. *Conclusion:* The characteristics and circumstances of suicide deaths on the railways are complex and multifaceted. The typology identified in this study may help to target preventative strategies prior to the incident as well as at different location types.

[3] Chase, S. G., & Hiltunen, D. (2020). *Consistent Trespasser Intent Determination Criteria Pilot Project* (No. DOT/FRA/ORD-20/15). United States. 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.

[4] Chase, S. G., Hiltunen, D., & Gabree, S. H. (2018). *Characteristics of Trespassing Incidents in the United States (2012-2014)* (No. DOT/FRA/ORD-18/24). United States. Federal Railroad Administration. Office of Research, Development, and Technology.

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

Martino, M., Doucette, A., Chase, S., & Gabree, S. (2013). *Defining characteristics of intentional fatalities on railway rights-of-way in the United States, 2007-2010* (No. DOT/FRA/ORD-13/25). United States. Federal Railroad Administration. Office of Research and Development.

Abstract: This report presents aggregate findings from 55 psychological autopsies of decedents who were identified as an intentional death (i.e., a suicide) on railroad rights-of-way between October 1, 2007, and September 30, 2010. The goal of this study was to assess whether there are unique characteristics of individuals involved in suicides on railroad rights-of-way compared with individuals who complete suicide by other means. The aggregate findings show that this sample of suicides on railroad rights-of-way share much in common with samples of suicides by other means. Only a few notable unique characteristics were found in the former population: the cases are more significantly marked by both severe mental disorder and substance abuse, the individuals tend to live near railroad tracks, and they are possibly less likely to have access to firearms. Additionally, the majority of these completed suicides occurred in urban or suburban areas as opposed to rural areas. The information collected for this effort may provide valuable information for the development of countermeasures or other intervention plans to mitigate this issue on railroad rights-of-way.

Mackenzie, J. M., Borrill, J., Hawkins, E., Fields, B., Kruger, I., Noonan, I., & Marzano, L. (2018). Behaviours preceding suicides at railway and underground locations: a multimethodological qualitative approach. *BMJ open*, *8*(4), e021076.

Abstract: Suicides by train have devastating consequences for families, the rail industry, staff dealing with the aftermath of such incidents and potential witnesses. To reduce suicides and suicide attempts by rail, it is important to learn how safe interventions can be made. However, very little is known about how to identify someone who may be about to make a suicide attempt at a railway location (including underground/subways). The current research employed a novel way of understanding what behaviours might immediately precede a suicide or suicide attempt at these locations.

Radbo, H., Svedung, I., & Andersson, R. (2012). Suicide and the potential for suicide prevention on the Swedish rail network: a qualitative multiple case study. Advances in safety, reliability and risk management.

Abstract: Acts of suicide on railways represent a serious public health and railway safety problem. Suicides constitute about 75% of all deaths in person-train collisions in Sweden. The aim of the study is to evaluate existing police and rail administration reports on railway suicide incidents from a preventive perspective, and to identify and categorize additional preventive-oriented information. Twenty-two cases of railway suicide have been reviewed, based on regular police and rail administration reports plus observations from complementary site visits. Findings: Neither police nor rail administration reports include enough information to guide future safety work. Findings from site visits show that structured preventive-oriented investigation routines may add important complementary details. Relevant data on behavioral, technical and environmental circumstances facilitating railway suicide need to be collected and analyzed by those responsible on a regular basis as an integral part of their safety work.

Related Measures

- CCTV and other detection systems
- Identify access points for potential trespassers
- Identify and monitor hotspots
- Identify funding opportunities
- Incident cost estimation
- Plan for expedited incident response
- Rail corridor risk assessment
- Risk assessment using forward facing CCTV