



U.S. Department
of Transportation
**Federal Railroad
Administration**



RR 20-01 | January 2020

FATAL TRESPASSER STRIKES IN THE UNITED STATES: 2012 – 2017

SUMMARY

The Volpe National Transportation Systems Center (Volpe) supports the Federal Railroad Administration (FRA) in addressing rail trespass and suicide prevention research, including the improvement of data quality and consistency.

This report provides a summary of FRA trespasser strike data from calendar years 2012–2017, including intentional (suicide) and accidental or inconclusive (non-suicide) fatalities on rights-of-way (ROWs). [Figure 1](#) charts the number of fatal suicide and non-suicide strikes by year, showing fairly consistent numbers throughout the time period.

The results of the analysis show that California, New York, Florida, and Texas consistently had the highest number of fatal trespasser strikes, regardless of intent.

Fatal suicide strikes most often occur during the spring, while non-suicides occur most often in the summer. Suicides tend to take place during later evening hours (8:00 p.m. to 12:00 a.m.) on both weekdays and weekends, while non-suicides tend to occur during weekday evening commute hours (4:00 p.m. to 8:00 p.m.), and during early morning hours on weekends (12:00 a.m. to 4:00 a.m.).

Individuals are most likely to be between age 15 and 34 for all fatal strikes. At the time of the strike, fatal suicides most often involve an individual lying down, while for non-suicides, individuals are most often walking/stepping. Suicides and non-suicide strikes both involve freight trains more often than passenger trains.

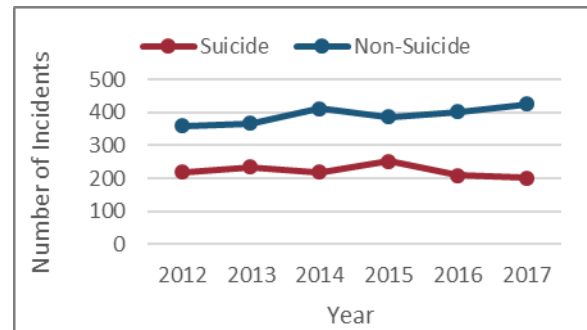


Figure 1. Fatal Trespasser Train Strikes by Year

BACKGROUND

Trespassers on the ROW are defined by FRA as, “Persons who are on the part of railroad property used in railroad operation and whose presence is prohibited, forbidden, or unlawful” (FRA, 2011).

FRA’s past efforts to address the problem of people trespassing on railroad property have focused on outreach to the public, railroads, and law enforcement agencies. In its 2018 National Strategy to Prevent Trespassing on Railroad Property report to Congress (National Trespass Strategy), FRA outlines a national, proactive approach to address the root causes of trespassing.

“Data gathering and analysis” is one strategic area included in FRA’s National Trespass Strategy. The present report provides trends resulting from analyses of trespasser strikes. These trends can inform FRA and railroads of the populations and locations most at risk.

FRA regulations require railroads to report deaths, injuries, and occupational illnesses arising from the operation of a railroad. This



reporting requirement includes trespasser casualties.

Trespasser casualties, including intentional acts of suicide, are the “leading cause of rail-related death in the United States” (FRA, 2018). Many of these incidents involved an individual struck by a train. The impact of these incidents reaches beyond the loss of life: train crews experience trauma; railroads and their surrounding communities experience disrupted service and road closures with an estimated overall economic impact of 4.6 million per incident (FRA, 2018). Many trespasser fatalities are preventable. With a better understanding of how these incidents occur, including the intent of the trespassers involved, railroads can more efficiently and effectively design and implement countermeasures.

FRA maintains incident report data that describes where and when trespass incidents occurred. This information is collected for any death or injury on railroad property using the Railroad Injury and Illness Summary and Continuation Sheet (FRA, 2011), regardless of whether the incident was related to rail operations or equipment.

As of June 2011, FRA also requires the reporting of suicides (fatal and attempted) on railroad property. Without consistent official determinations of injuries, the underreporting of suicide attempts is likely.

OBJECTIVES

The analysis of train strike data provides historical findings to FRA and railroads so they can address the populations and locations most at risk. The findings may also provide value in the development and implementation of strategies to mitigate the number of suicide and non-suicide trespasser strikes that occur on U.S. railways. This analysis also seeks to identify potential limitations that could lead to inconsistencies in the data, such as the number of categories available and the use of definitions.

METHODS

Injury and Illness Summary reports were obtained directly from FRA. Using the FRA Guide for Preparing Accident/Incident Reports (2011), incidents were filtered so that only trespasser strikes (using FRA Event Circumstance “Struck by on-track equipment”) resulting in a fatality were examined. Grade crossing incidents with a Highway/Rail Grade Crossing Accident Incident Report form were excluded.

RESULTS

Using the above criteria, 3,687 trespasser fatalities involving a train strike were examined from calendar years 2012–2017 (refer to [Table 1](#)). Of these, 1,332 were officially determined to be suicides, while 2,355 were non-suicides (including accidental and inconclusive deaths).

Table 1. Total Fatal Trespass Incidents and Train Strikes, 2012–2017

	Suicide	Non-Suicide
Total Fatal Trespass	1,462	2,732
Fatal Train Strikes	1,332	2,355

Location

Differences in the number of strikes by state may be due, in part, to differences in population and train operations. California, New York, Florida and Texas had the most fatal trespasser strikes, regardless of intent (see [Table 2](#)). Illinois had the second-highest number of fatal suicide strikes, but ranked only seventh for non-suicide strikes. Pennsylvania had the fourth-highest number of fatal non-suicide strikes, but ranked seventh for suicide train strikes.

Table 2. Fatal Trespass Train Strikes by State

Suicide		Non-Suicide	
State	Total	State	Total
CA	250	CA	451
IL	138	TX	163
NY	99	FL	145
FL	76	PA	124
TX	69	NY	99



Season and Time of Day

Minimal seasonal differences were found between fatal suicide and non-suicide strikes. Fatal suicide strikes occurred most often in the spring (29 percent), while fatal non-suicides occurred most often in the summer (28 percent). Both suicides and non-suicides occurred least during winter (18 percent and 20 percent, respectively).

The time of day the strike took place and if it was a weekday or weekend was examined. Fatal suicide strikes tended to take place after 8:00 p.m., regardless of whether they occurred on a weekday or weekend. In contrast, non-suicide strikes were most often in the early morning (before dawn) between 12:00 a.m. and 4:00 a.m. (24 percent) on weekends, and during common evening commute times between 4:00 p.m. and 8:00 p.m. (25 percent) on weekdays, as shown in Figure 2.

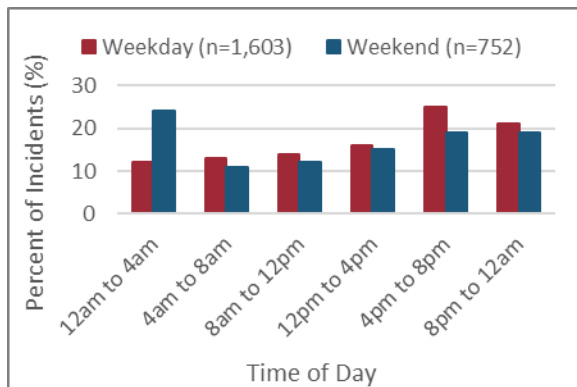


Figure 2. Fatal Non-Suicide Trespass Train Strikes by Time of Day

Individuals

The age of the individual varied only slightly between fatal suicide and non-suicide strikes, most commonly between 15 to 24 years and 25 to 34 years, as shown in Figure 3. These age groups accounted for 43 percent of suicides and 40 percent of non-suicides. Gender is not included in FRA data.

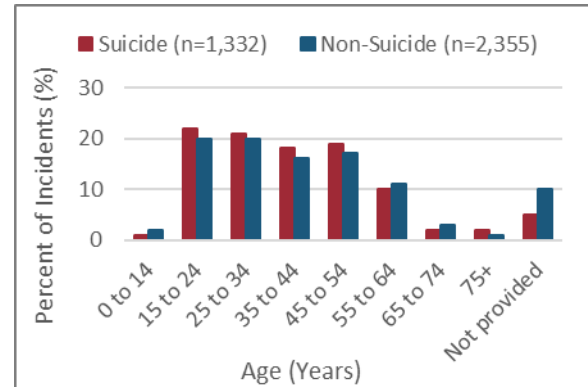


Figure 3. Fatal Trespass Train Strikes by Age

Physical Action

To examine the action of the individual at the time of the strike, some of the similar FRA categories were combined, as shown in Table 3.

Table 3. Fatal Trespass Train Strikes by Action

New Action Category	FRA Action Category
Lying Down	Lying down, Laying
Walking/Stepping	Walking, Stepping down, Stepping over, Stepped on

Figure 4 highlights the four most common actions identified in the data; it is not an exhaustive list of actions taken by the individuals involved. For suicides, the most common action was lying down (33 percent), while the most common action for non-suicides was walking/stepping (47 percent).

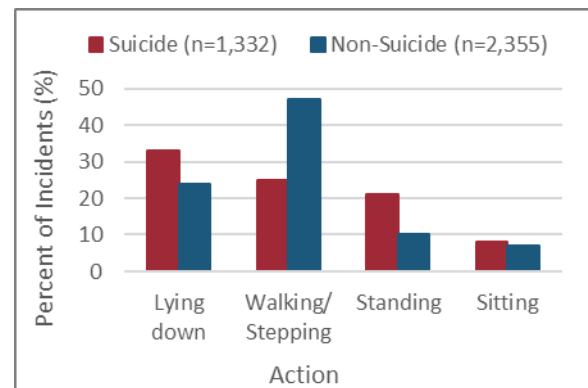


Figure 4. Fatal Trespass Train Strikes by Action



Train Type

Train type (i.e., type of equipment) is included in FRA data, but may not be consistently collected/reported due to the limits in the FRA taxonomy and the extensive list of categories that are not all well-defined. Despite these limitations, the available data indicate that a similar percentage of both fatal suicide and non-suicide strikes involve freight (62–63 percent) and passenger (33–35 percent) operations.

CONCLUSIONS

The data show that there are slight differences between fatal suicide and non-suicide strikes, primarily related to when the strikes took place and the individuals involved. The factors presented in this document provide an example of the types of factors that may be most useful in tailoring countermeasure strategies. In addition, limitations to the FRA taxonomy for reporting these incidents were identified, including the large number of categories and limited definitions, which can lead to inconsistent data.

FUTURE ACTION

A more detailed report of all FRA trespass incident data, including injuries, is forthcoming. This will also include recommendations for incident data collection to assist FRA and railroads in their goals of improving data quality and consistency.

REFERENCES

Federal Railroad Administration. (2011). [*FRA Guide for Preparing Accident/Incident Reports*](#).

Federal Railroad Administration. (2018). [*National Strategy to Prevent Trespassing on Railroad Property*](#). Washington, DC: U.S. Department of Transportation.

ACKNOWLEDGEMENTS

This work was performed under interagency agreements between the FRA Human Factors Division and the Volpe National Transportation Systems Center.

CONTACT

Starr Kidda, Ph.D.

Federal Railroad Administration
Office of Research, Development and Technology
1200 New Jersey Ave, SE
Washington, DC 20590
(202) 493-1300
starr.kidda@dot.gov

Stephanie Chase, Ph.D.

Volpe National Transportation Systems Center
Transportation Human Factors Division
55 Broadway
Cambridge, MA 02142
(617) 494-6348
Stephanie.Chase@dot.gov

Danielle Hiltunen

KBRwyle
Volpe National Transportation Systems Center
55 Broadway
Cambridge, MA 02142
(617) 494-3145
D.Hiltunen.ctr@dot.gov

KEYWORDS

Suicide, trespass, train strike, railroad, fatalities

CONTRACT NUMBER

DTFR5315X00043

Notice and Disclaimer: This document is disseminated under the sponsorship of the United States Department of Transportation in the interest of information exchange. Any opinions, findings and conclusions, or recommendations expressed in this material do not necessarily reflect the views or policies of the United States Government, nor does mention of trade names, commercial products, or organizations imply endorsement by the United States Government. The United States Government assumes no liability for the content or use of the material contained in this document.