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Administration

Defining Characteristics of Intentional Fatalities on Railway Rights-of-Way in the United States, 2007–2010

Office of Research
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13. ABSTRACT (Maximum 200 words) 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.				
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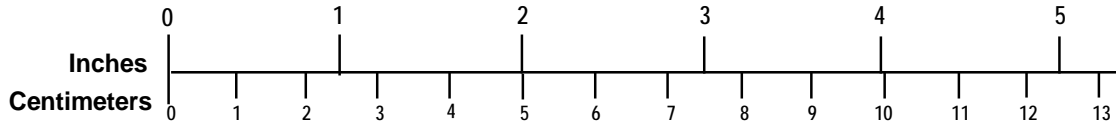
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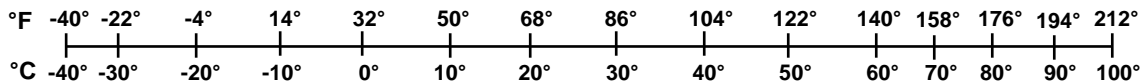
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Executive Summary

Background

Completed suicides on railroad rights-of-way in the United States are relatively rare events; however, the impact on witnesses, discoverers, surviving loved ones, first responders, and railroad employees can be significant. In light of the consequences of these completed suicides to both the individuals involved and the railroads, identifying potential means to prevent these deaths would be beneficial. This study aims to assess whether individuals who complete suicide on railroad rights-of-way possess any unique characteristics that may help to inform the development of countermeasure or intervention strategies.

Methodology

To collect data about completed suicides on railroad rights-of-way in the United States, American Association of Suicidology (AAS) project investigators confirmed the determination of suicide as the cause of death; relevant data was gathered from medical examiner and coroner rulings and through psychological autopsy interviews with the decedents' next of kin. The psychological autopsy interviews involved a semi-structured interview protocol developed specifically for this study. Interviews were held with 165 next of kin and close friends to obtain information about 55 identified decedents.

Findings

The final study sample of 55 cases of suicide on the railroad right-of-way was found to be very similar to the known information about suicides by other means. Only a few factors seemed to differ from what would be expected from a suicide by other means. The identified decedents were generally found to be below the age of 50 and often had a last known address in close proximity to the railroad tracks. They were also more often described as having a mental disorder or substance abuse problem or both. Lastly, this sample was unlikely to have had access to a firearm. These factors appeared to influence the individuals' choice of this method to end his or her life.

Conclusion

Suicides on railroad rights-of-way have not been widely researched in the United States. This study revealed that individuals who complete suicide on the railroad rights-of-way share characteristics with individuals who complete suicide by other means. However, some differences were noted. Suicides on railroad rights-of-way involved higher proportions of younger individuals, according to national statistics provided by the Centers for Disease Control (CDC). Additionally, overall, decedents tended to have limited access to firearms (a more common means for completing suicide) and also tended to live near railroad tracks. The information detailed in this report can help in the development of a more strategic countermeasure approach. By better understanding the interacting characteristics of the individual and site at which these incidents occur, countermeasures can be developed and implemented in a more effective way.

1. Introduction

Trespassers on railroad rights-of-way have long been a serious issue for the railroad industry. As of the end of this data collection, the Federal Railroad Administration (FRA) does not track the number of completed suicides that occur each year; therefore, it is believed that a proportion of reported trespasser deaths are intentional (i.e., suicides).¹ When an individual takes his or her life on the railroad right-of-way, the effects on the railroad industry and its personnel are immense. By providing a better understanding of the characteristics and factors associated with individuals who intentionally choose to end their life in this manner, it is hoped that this study will aid in the development of effective countermeasures to reduce the frequency of these terrible events.

In a Research Results report by the FRA Office of Research and Development titled “Demographic Profile of Intentional Fatalities on Railway Rights-of-Way in the United States²,” the researchers reported that a minimum of 25 percent and likely more than 35 percent of all fatalities on the railroad right-of-way are the result of an intentional act. They found that at least 268 completed suicides occurred on U.S. railroad rights-of-way between June 2006 and May 2007 (compared with 497 FRA reported trespasser fatalities during that same timeframe) and at least 428 completed suicides occurred on U.S. railroad rights-of-way between June 2007 and May 2010 (compared with 1,341 FRA reported trespasser fatalities during that same timeframe). The goal of the current report is to provide a more comprehensive understanding of the distinguishing factors that influence individuals who complete suicide on railroad rights-of-way.

1.1 Purpose

Completed suicides on railroad rights-of-way have not been widely researched in the United States. It is unknown whether individuals who complete suicide in this manner are uniquely affected by factors that may have little or no influence on individuals who complete suicide by other means. If the population of individuals who complete suicide on railroad rights-of-way is different from those who complete suicide by other means, then intervention strategies which specifically target these individuals may need to be developed. This study aims to assess whether there are indeed unique characteristics influencing or affecting individuals who complete suicide on railroad rights-of-way rather than by other means. The results of the study may inform future countermeasure or intervention strategies and perhaps dissuade individuals from this course of action.

¹ In June 2011 FRA began to require railroads to report trespasser fatalities identified as a suicide; however, as of the publication of this document, these numbers are not released publicly.

² Currently in FRA review process for publication

1.2 Definitions

For the purposes of this study, a railroad will be defined as follows using Railway Age's Comprehensive Railroad Dictionary:

1. All forms of non-highway ground transportation that runs on rails, including freight transportation using locomotives and freight cars; commuter or other short-haul rail-passenger service in metropolitan or suburban areas; high-speed ground transportation systems that connect metropolitan areas, without regard to whether they use new technologies not associated with traditional railroads. This term does not include rapid transit operations within an urban area that are not connected to the railroad system of transportation.
2. A system of railroad track including the land, stations, rolling stock, and other related property.

The title of this document does not include the term "suicide" and instead states "Intentional Fatalities." This is because existing voluntary media guidelines suggest that using the term "suicide" in a headline may actually increase the likelihood of copycat incidents.³ Accordingly, members of the media should take heed if considering publishing any information included in this report and reference the corresponding media guidelines. However, since the term "suicide" is widely used in the past research discussed within this paper, and well understood, the term suicide will not be replaced in the body of this report.

1.3 Background

This is the first study that focuses on whether there are characteristics, risk factors, and warning signs unique to individuals who complete suicide on railroad rights-of-way in the United States, in contrast to individuals who complete suicide by other means. Previous research on this topic has primarily been conducted outside the United States (Ladwig & Baumert, 2004; Mishara, 1999). Work conducted within the United States has been limited to epidemiological or demographic information (Botha, et al., 2010). In addition, studies such as the one by Botha, et al. are based primarily on highly urbanized railroad systems, with no clear discrimination between freight, commuter, and transit lines. While commuter and transit lines are mostly in urban and suburban areas, freight tracks also cover rural areas which are known to experience different types of health concerns, for example, higher rates of substance abuse and lower likelihood of treatment (Eberhardt, Ingram, Mkuc, et al, 2001). These findings highlight key patterns regarding completed suicides on each type of track.

³ Reporting on Suicide: Recommendations for the Media. Available online at <http://www.sprc.org/sites/sprc.org/files/library/sreporting.pdf>

Although most studies have been conducted only on urbanized stretches of railroad, they still provide a baseline estimate of the age and gender of the decedents involved in railroad right-of-way suicides. A Danish study by Lindekilde and Wang (1985) found that 44 percent of those who completed suicide on railroad rights-of-way were between 15 and 29 years old, while only 11 percent of those who completed suicide by other means were in this age group. Kerkhof (2003) noted that in the Netherlands most suicides on the railway involved men between 20 and 29 years old. And Botha et al. (2010) found that suicides on the Caltrain commuter rail system were 3.5 times more likely among men than women.

The Suicides and Open Verdicts on the Railway Network (SOVRN) Project, commissioned in 1999 in the United Kingdom, used data from investigations by coroners and case study interviews to identify characteristics of individuals who completed suicide on the railroad over a 3-year period (N = 103) (Abbott, Young, Grant, Goward, Seaward, & Pugh, 2003). The study found demographic results relatively similar to those cited above: the decedents in this study were typically male (the male-to-female ratio is approximately 4:1) and half of the decedents were between 16 and 40 years old. In addition, this study was able to go beyond basic demographic data to provide information about potential risk factors that led to each individual's suicide and, in some cases, specific information about the decision to complete this act on the railroad right-of-way.

Using coronial investigations and psychological autopsies, the SOVRN project was able to characterize decedents as being unemployed (37 percent), living alone (25 percent), and living with a physical condition (26 percent). Additionally, for whom this information could be gathered, 76 percent of the decedents had been diagnosed with a mental health condition at the time of death (and 29 percent of those decedents had been diagnosed with an additional, secondary mental health condition).

Like the SOVRN project, the current research does not rely solely on coroner and police reports to gather information about decedents. The psychological autopsy method used in this report allowed researchers to collect information about each decedent that goes beyond typical demographic data. A psychological autopsy allows a researcher to obtain information about the likely mental and physical state of an individual who dies by suicide, as well as the relevant characteristics of their environment and location of death (Cavenagh, Carson, Sharpe, & Lawrie, 2003).

1.4 Psychological Autopsy

In 1958, Edwin Shneidman, Norman Farberow, and Robert Litman—then directors of the Los Angeles Suicide Prevention Center—coined the term “psychological autopsy.” These clinician-researchers, working in collaboration with the Los Angeles County Medical Examiner’s Office, devised a set of procedures to assist the medical examiner (ME) in medico-legal investigations for cases where the ME could not readily determine the manner of death (suicide, homicide, accident, or natural). Since then, the psychological autopsy has evolved into a systematic “tool” for collecting retrospective psychological and related data about a decedent through semi-structured interviews with knowledgeable informants (typically family members, friends, and coworkers or classmates) and analyses of archived documents and records of the decedent’s life (e.g.,

health records, criminal records). Where deaths have clearly been determined to be suicides, the psychological autopsy can potentially identify distal (lifetime) and proximate (near term) risk factors. (Note: distal and proximate are the terms used by the psychological autopsy community). When conducted with trained researchers and a standardized protocol, a psychological autopsy has the potential to yield reliable and valid data (Kelly & Mann, 1996; Brent, Perper, Mortiz, Allman, Roth, Schweers, & Balach, 2007).

Although data collected from psychological autopsies are seen as useful to researchers, it is important to note that the data cannot be objectively validated for several reasons (which are detailed in the limitations section of this report). One most obvious limiting factor is that the findings cannot be confirmed by the decedent; therefore, the results presented in this report will focus primarily on factual information (e.g., employment status) and not discuss other more subjective findings (e.g., the victim was acting more reckless). For example, a suicide which appeared to be impulsive to one next of kin may have been perceived by another informant as planned; this subjectivity leads to an increase in the potential for error in the sample. In the current study, aggregate findings from these psychological autopsies were used to provide a basic understanding of modal factors within the decedents life and to better understand why suicides occur on railroad rights-of-way (in contrast to other available and accessible methods). The study discussed in this paper is the first documented psychological autopsy study of suicides on the railroad rights-of-way in the United States.

2. Methodology

2.1 Overview

The current study uses a psychological autopsy, which utilizes a semi-structured interview approach, to investigate factors associated with an individual who has completed suicide. The psychological autopsy is used as a tool to reconstruct a decedent's life in order to understand the causes, mechanisms, and, if undetermined, the mode or manner of death. It relies primarily on the identification and cooperation of knowledgeable informants, typically next of kin. For the current study, researchers developed a specific protocol for collecting data about individuals who complete suicide on railroad system rights-of-way in the United States. The protocol will be described in the following sections. Limitations of the protocol will be discussed in the conclusion of this section (section 2.6).

2.2 Case Identification

Four hundred sixty six (466) cases were identified as completed suicides on railroad rights-of-way in the United States during the 36-month timeframe of October 1, 2007, through September 30, 2010. For each of the 466 cases, the representative medical examiner or coroner was contacted to verify that the manner of death was determined to be a suicide.⁴ A copy of the decedent's death certificate was received in 237 (51 percent) of the cases. Some discrepancy between suspected suicides and those corroborated by medical examiners is not uncommon and is largely due to such issues as differential thresholds of interpreting evidence and relationships between law enforcement and clinicians (Timmermans, 2005). For each of the 237, an attempt was made to contact the decedent's next of kin and close friends and ask them to participate in this study for the purpose of learning more about what factors may have been influential in the completed suicide. Contact information was available for 182 of the 237 total cases.

2.3 Contacting Informants

From information contained in the medical examiner or coroner reports, data elements were compiled. These elements consist of personal and demographic information about the deceased (e.g., home address, age, gender, ethnicity), as well as the date and time, manner, and location of the death. This information, along with additional data found through public sources (e.g., memorials, social networking sites), was used to identify the next of kin and other individuals potentially knowledgeable about the decedent.

To allow time for next of kin, friends, and coworkers of the decedent to move past the initial shock of the death being investigated, attempts to recruit them for participation occurred after a minimum of 6 months had passed since the death had been ruled a

⁴ The determination of the manner of death (accident, suicide, homicide, or natural) is made by either a medical examiner or coroner. Medical examiners are licensed physicians, often with training in forensic pathology, who are appointed to their positions. Coroners are elected officials with no specific medical training; they are responsible for completing death certificates.

suicide.⁵ Initial contact consisted of a packet including a project description and a letter of introduction identifying the researcher as the official performer of this Railroad Research Foundation and Federal Railroad Administration (RRF and FRA) funded research. The project information packet was followed up by a telephone call placed by the research team staff to request a face-to-face meeting for the interview. If the next of kin agreed to participate, an investigator contacted the next of kin to arrange a meeting. At the time of consent, the nature of the study and potential risks and benefits were discussed. Potential interviewees were given time to ask questions and were offered a summary of the research protocol. Interviewees were asked to sign a consent form. Interviewers emphasized the message that had been already transmitted in the initial telephone contact: that a respondent could stop the interview at any time. Family members or friends who were unable to respond to questions regarding the informed consent procedure were excluded from the study. To identify additional family and friends for interviews, the next of kin were asked if there were any friends, teachers, coworkers, or significant others that they felt could provide further information.

In deciding the number of informants to be interviewed for each case, the project followed guidance offered by the U.S. Surgeon General's *National Strategy for Suicide Prevention* which states that for every suicide, there are six to eight individuals who have been closely associated with the decedent (U.S. Department of Health and Human Services, 2001). The goal of the current study was to interview up to eight informants per case, unless conflicting reports from the first eight informants necessitated additional interviews. The selection of informants was based on their presumed knowledge of the decedent (using criteria such as proximity, duration, and relationship with decedent) and of the events leading up to his or her death.

Investigators stopped soliciting additional interviews when one of the two scenarios listed below occurred. Investigators strived to accomplish the first scenario whenever possible, but would resort to the second scenario when necessary:

1. All the questions in the protocol were answered and multiple informants corroborated the responses.
2. Discussions with next of kin or other informants revealed no other informants who were willing to be interviewed or who had any further information about the decedent.

A final sample of 55 cases is included in this report. Table 1 summarizes the process leading to the final selection. The final sample was derived from the 466 total identified cases of which 237 were confirmed as suicides by autopsy or death certificate. Of the 237 cases which were determined to be a completed suicide, AAS project staff found contact information for next of kin in 182 cases. Next of kin in 69 cases agreed to be interviewed and interviews were scheduled in 63 of those cases. In 36 of the 182 cases, the next of kin refused participation and in 77 cases no response was received. Although

⁵ While progress through the grief process varies by individual, the principal investigator proposed 6 months as a reasonable time to be sensitive to the informants' grief.

63 cases were scheduled, funding constraints allowed only 61 cases to be completed. The remaining two cases were cancelled and appropriate outreach was extended to these individuals by the AAS project coordinator. Interviews for each case were generally conducted over a 2-week period, depending on the respondents' availability.

Table 1. Derivation of Study Sample from Total Identified Completed Suicides on Railroad Rights-of-Way

Description	Number
Total identified cases between October 1, 2007, and September 30, 2010	466
Total confirmed cases	237
Number of cases sent letters	182
Number of cases for which there was no reply	77
Number of potential cases that refused to participate	36
Number who consented	69
Number of cases with scheduled interviews	63
Number of cases interviewed	61
Completed cases that did not meet quality screen of being able to answer the research questions outlined in Section 3	6
Final Sample of cases	55

2.4 Interview process

A total of 165 informants provided data, resulting in a mean of 3 informants and a range of 2 to 9 informants per case. The maximum time period between the suicide and the interview was two years and the minimum was six months. Before conducting the interviews, next of kin and other informants were asked to review and sign a consent form to indicate that they were aware that the data would be held confidential and that they had the right to withdraw from the interview at any time. The nature of the study and potential risks and benefits were discussed in greater detail. Next of kin were also asked to sign a standard written authorization for AAS project staff to obtain the decedent's health records from healthcare providers. For all the cases, next of kin provided this authorization. However, despite authorization, no healthcare providers returned calls; therefore, none provided the requested information regarding treatment provided to the decedent.

Interviews were conducted by one investigator with each informant individually. When family members felt strongly that they needed another family member to support them through the interview the investigator conducted the interview with both family members, however, this did not happen frequently. At the end of each interview, the investigator

provided the informant with support information such as a list of support groups in the local area. Of the 165 informants, 29 accepted the contact information for mental health therapy or treatment. There was no further follow-up to determine whether the informants actually sought help.

The investigator relied on handwritten notes taken during the interview. Investigators made every attempt to verify the information provided by the informants by seeking corroboration from other informants and asking for evidence where appropriate. The investigators' final assessment for each case was reviewed by the principal investigator and research director for quality control. When the assessments were reviewed, it was determined that in six cases, the quality of information obtained from the informants was insufficient to adequately understand the circumstances leading to the suicide, and no further informants were available for those cases. All information was maintained by the AAS project coordinator with documents identified by ID number and locked in a secure area.

2.5 Investigator Training

Investigators were required to have a background in the social sciences (although not all were psychologists) and were trained for this study to identify and deal therapeutically with any possible negative psychological consequences from the interview. Upon selection as an investigator for this project, and before being assigned a case, every investigator received 12 hours of training from the principal investigator and research director in supportive interviewing techniques. In the training, investigators were provided information about psychological autopsy studies, the study methodology, and background. They were trained in how to obtain information for each question on the semi-structured protocol and were asked to role-play the interview. In addition, when half of the cases had been completed, each investigator received 16 hours of updated training, based on the experience gained through this study, to refine their interviewing and data collection skills. During this updated training, investigators built on their practical knowledge in responding to commonly encountered challenges and in data reporting so as to minimize additional questions during case review with the principal investigator and research director.

2.6 Methodological Limitations

Although psychological autopsy is recognized as a "best practice" tool for establishing possible causal factors leading to suicides, it is not without known limitations. One limitation is the lack of control over the informants chosen for the study. Although researchers were able to eliminate informants who were deemed to be untrustworthy or not knowledgeable enough about the individual in question, the procedures of the psychological autopsy cannot ensure that all informants are equally knowledgeable about the decedent or that approximately the same amount of time has passed between the decedent's death and each of the interviews. As such, the depth of knowledge that can be obtained about each decedent is likely to vary. As noted earlier, some inconsistency is to be expected in the interpretation of the decedent's thoughts, emotions, and motivations. Therefore, we purposefully chose to focus on the more objective information (e.g.,

employment, criminal or legal status, etc.) as opposed to estimating the subjective information as judged by the informants (e.g., the decedent's emotional state).

3. Results

The final study sample consists of 55 cases, as shown in Table 1. Each case consists of one decedent and a varying number of interviewed informants. In the following section, demographic characteristics of each decedent are presented, followed by additional objective data collected by investigators during the psychological autopsy interviews.

3.1 Demographic Characteristics

Gender. The final sample of 55 cases was composed of 9 (16 percent) females and 46 (84 percent) males. This distribution is similar to that of all completed suicide reports on the railroad rights-of-way and for U.S. suicides by all means from 2007 to 2010 (see Table 2 ($\chi^2 = 0.748$, $df=1$, $P>0.05$)).

Age. The median age of the 55 psychological autopsied cases was 40 years. The distribution of ages showed that 18 (33 percent) decedents were under the age of 30, 22 (40 percent) decedents were between the ages of 31 and 50, and 15 (27 percent) decedents were 51 years old or older. In comparison, the age distribution for suicides by any means in the United States shows that 31,416 (22 percent) of the decedents are under the age of 30 and 58,880 (40 percent) of decedents are 51 years old or older. The sample for this study may appear to have fewer older individuals than would be expected, given the national statistics noted in Table 2 below; however, a chi square test of significance did not reveal a significant difference ($\chi^2 = 5.59$, $df=2$, $p>0.05$). Additionally, it is worth noting that the distribution of ages from the sample of psychological autopsies differed from the age distribution of all reported suicides on the railroad right-of-way that occurred during the same time frame. Therefore, the appearance of an over representation of younger victims found in the psychological autopsied cases is likely to only be an artifact of the limited sample size and not a true age bias.

Table 2 shows the distribution of gender and age as a percentage of three different groups: first, the sample of 55 cases included in this study; second, the total number of completed suicides reported during this study duration; and third, the total number of suicides by all means in the United States between January 1, 2007, and December 31, 2010.⁶

⁶ The time period for the suicide by all means comparison group (January 2007–December 2010) is not the same as either the psychological autopsy case group or the all reported rail suicides group (October 2007–September 2010). This is because the CDC estimates for suicides by all means are presented as annual numbers.

Table 2. Comparison of Gender and Age of Study Population, Confirmed Cases, and U.S. Suicides

Characteristic	Cases included in Psychological Autopsy study 10/2007–9/2010 (% of N = 55)	All reported suicides identified by the study 10/2007–9/2010 (% of N = 466)	U.S. suicides by all means 1/2007–12/2010 (% of N = 145,906)
Male	84	81	79
Female	16	19	21
Age <30 years	33	18	22
Age 31–50 years	40	47	38
Age >50 years	27	35	40

Race. In the initial study sample of 466, only 262 reported race. Of the cases that reported race, the majority of the decedents were white, 209 (88 percent). Of the 55 cases included in this sample 53 (96 percent) were white. Seven percent of the confirmed cases and two percent of the autopsied cases were black, and the remainder was composed of other races. This finding is also consistent with suicides in general⁷; the CDC reports that 91 percent of suicide decedents were white and 6 percent were black.⁸

Sexual Orientation. Based on information provided for only 52 decedents for whom sexual orientation was reported, more than 90 percent (approximately 47 of the decedents) were believed to be straight, compared to fewer than 5 individuals who were known to be gay, lesbian, bisexual, or transgender. Although there is no comparable and consistent national data to compare with regards to suicide by all means, a comparable 7% of women and 8% of men identify as gay, lesbian or bisexual; therefore the distribution of sexual orientations found in this study sample were not very different from the overall national population (Reece, Herbenick, Fortenberry, Dodge, Sanders, & Schick, 2010).

Marital Status and Offspring. Of the 55 decedents, 31 (56 percent) were single and never married (but not cohabitating), 11 (20 percent) were divorced or separated, and 8 (15 percent) were married at the time of their death. Less than five individuals were widowed (and not married, divorced, or separated) or cohabitating. One out of four of the single, never married individuals had experienced a recent breakup. Although recent national surveillance data are not available for comparison, a 1988 study that analyzed overall U.S. suicide rates over a 3-year period found that 47 percent were married, 29

⁷ The terms “suicide in general” or “suicide by all means” are used in this report to refer to all suicides in the United States, including those on the railroad rights-of-way. Suicides on railroad rights-of-way represent a very small percentage (less than 1 percent) of all suicide cases.

⁸ http://www.cdc.gov/injury/wisqars/fatal_injury_reports.html

percent were single, 9 percent were widowed, and 15 percent were divorced (Smith, Mercy, & Conn, 1988).

Only 19 (35 percent) of the decedents in the current study sample had children: 6 (11 percent) decedents had one child, 7 (13 percent) decedents had two children, and 6 (11 percent) decedents had more than two children.

3.1.1 Geographic Distribution

To better understand the location of all reported completed suicides on railroad rights-of-way, a map of the United States is presented below to illustrate the distribution of these cases. Figure 1 shows the distribution of confirmed completed suicides on railroad rights-of-way (blue markers) along with the distribution of cases autopsied in this study (red plus signs). It is important to note that each blue marker may represent more than one case if multiple suicides occurred on the railroad right-of-way in a single city within the study period. Therefore, it is impossible from this map to get an accurate picture of where the most completed suicides occurred in the United States. However, a visual comparison of the two sets of markers shows some similarity between the nationwide distribution of all confirmed cases and the sample. The only notable omissions in the current sample seem to be the Northwest United States and portions of the lower Midwest (e.g., Arkansas, Tennessee, and Kentucky), where several confirmed suicides occurred on railroad rights-of-way but was not included in the study sample.

Figure 1. Geographic Distribution of Confirmed Suicides on Railroad Rights-of-Way (N = 237) and Study Sample (N = 55)



Blue markers and red crosses indicate all the confirmed suicide cases on railroad rights-of-way; red crosses indicate the cases included in our study sample. *Map of the United States. Retrieved on Aug 21, 2007, from <http://maps.google.com>.*

3.1.2 *Employment*

Of the decedents in this study, 49 (90 percent) had at least some high school education, 26 (47 percent) had at least some college education, and fewer than five decedents were full-time students at the time of their death. Fourteen (25 percent) decedents were known to have full-time employment at the time of death, and eight (15 percent) were known to have part-time employment.

Of the decedents, fewer than five were full-time students so their employment status was not included in the data sample. Of the remaining 51 decedents, 22 (43 percent) were known to have full- or part-time employment. Of those with an employment history, only 9 (19 percent) held professional jobs, such as educator or division manager, 13 (27 percent) had worked in the service industry, 12 (25 percent) had histories as laborers, and 6 (13 percent) performed temporary jobs.

3.1.3 *Government System Involvement*

Of the 53 cases for which this information was available, 25 (47 percent) were involved with a nonmedical social system, such as the welfare system or the criminal justice system, at the time of their death. Eight (15 percent) of the decedents were involved with the legal system at the time of the suicide and five of these cases involved upcoming court dates following arrest for driving under the influence of alcohol.

3.1.4 *Mental and Physical Disorder*

Mental Disorder. A mental disorder is a health condition characterized by significant dysfunction in an individual's cognitions, emotions, or behaviors that reflects a disturbance in the psychological, biological, or developmental processes underlying mental functioning.⁹ Mental disorders are diagnosed according to criteria that present in the form of symptoms, feelings, thoughts, or behaviors either observable to or reported by the individual to others. Since no medical providers responded to the researchers' requests for formal diagnoses, the research team used informant interviews to determine the presence of a mental or physical disorder in the decedent. For this study the criteria used by the research team to confirm a mental disorder as present in the decedent were that an interviewed informant reported a previous diagnosis made by a professional *or* the interviewee had evidence of prescriptions, medical records or other records to provide to the investigator to confirm the diagnosis.

Mental disorder is a known risk factor for suicide and has been reported to exist in approximately 90 percent of all adult suicides (Phillips, 2010; Cavanaugh, Carson & Sharpe, 2003; Tanney, 2000). The results of this study suggest that the rate of mental disorder among the cases studied may be even higher; 53 (96 percent) of the total 55

⁹ American Psychiatric Association (2010). *Definition of a Mental Disorder*. Retrieved from <http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=465>

cases were reported to have a mental disorder. Informants reported that 25 (47 percent) had been prescribed medications for their mental disorder, and 12 (23 percent) were in therapy. Of the 25 who had been prescribed medications, informants indicated that 10 (40 percent) were taking the medications as prescribed; only 5 of those 10 reported the medication as effective.

Few studies have investigated the prevalence of mental disorders among decedents of completed suicides on the railroad rights-of-way. One such study out of Queensland, Australia, reported that approximately 40 percent of individuals in a 15-year span of completed suicides on railroad rights-of-way had a mental disorder (De Leo & Krysinska, 2008). Another study in the Netherlands reported that 53 percent of the 57 cases studied were in psychiatric care at the time of their suicide, and two-thirds were in inpatient care (Houwelingen & Kerkhof, 2008). This study is just one example of an oft-cited finding in European studies suggesting that railroad suicide deaths frequently occur at railroad track sites within just a few kilometers of psychiatric hospitals (Houwelingen, Kerkhof, & Beersma, 2010).

Also noted in this sample of 55 cases is that 40 (73 percent) of these cases were reported to have two or more co-occurring diagnoses. Among those with reported co-occurring mental disorders, only 10 (25 percent) were in therapy at the time of death. Twenty-one (53 percent) had reportedly been prescribed medications for their conditions at the time of death. Only 9 (43 percent) of the individuals who had been prescribed medications for co-occurring mental disorders were reported to be taking their medications as prescribed at the time of death. Further, informants revealed that the medications prescribed were perceived to be effective for fewer than half of the individuals reported as being compliant with their prescriptions.

During the interview process, interviewers also asked informants about the decedent's emotional and psychological condition leading up to the incident. Although a reliable account of the specifics of the decedent's emotional and psychological condition may not be possible to ascertain through this process, it was clear to the investigators that most decedents suffered from severe emotional or psychological distress in the time leading up to the suicide.

In some cases, the family of the decedent had a history of mental illness. Thirty-five (64 percent) decedents were reported to have had a family member with a mental disorder. For 17 of those individuals, at least one of their parents had a mental disorder, and in 13 cases, at least one sibling.

A family history of suicide exposes the vulnerable individual to a model that has the potential to influence and impel suicidal behaviors. Nineteen decedents (35 percent) had a family history of suicide. Moreover, a family history may indicate a genetic or biochemical vulnerability to suicide.

Physical Disorder. For some individuals, physical illness underlies their decision to end their life by suicide. Lung disease, Acquired Immune Deficiency Syndrome (AIDS), and ulcers, among others, have all been seen to be associated with a significantly increased likelihood of suicide attempt, independent of the effects of mental disorders (Goodwin, Marusic, & Hoven, 2003).

Twenty-eight (51 percent) decedents in this study had at least one chronic physical illness. Chronic physical illnesses reported by informants included diabetes (7), chronic pain (5), and less than five cases each of cardiovascular disease, endocrine disorders other than diabetes, brain injury, and asthma. Medical conditions such as these have long been recognized as risk factors for suicide (Berman & Pompili, 2011).

3.1.5 Substance Abuse and Toxicology Reports

Substance abuse, or the abuse of alcohol, use of illicit drugs, or abuse of prescription medications, is a known risk factor (both acute and lifetime) for suicide (Center for Substance Abuse Treatment, 2008). All decedents in this study were reported to have abused substances, to have had a mental disorder, or both. Among the study sample, 34 decedents (62 percent) were reported to have been heavy consumers of alcohol, and 32 decedents (58 percent) were reported to have been abusing drugs (these two groups overlap). Among the decedents who were reported to have abused substances, all except two also had a mental disorder. According to the CDC, 16.5 percent of U.S. individuals who completed suicide between 2003 and 2004 had alcohol dependence problems.

Toxicology reports with Blood Alcohol Content (BAC) at the time of death were available for 43 (78 percent) decedents. At the time of death, 22 of the 43 (51 percent) cases had positive readings: blood alcohol content (16), illicit drugs (7), or prescription drugs (7). The most frequently abused illicit drugs were marijuana (5) and cocaine (fewer than 5). It was also found that a single individual had positive readings for more than one substance. Of the 16 decedents who had been drinking at the time of their death, 15 had a BAC above the statutory legal limit for driving a vehicle in most states (.08).

3.1.6 Precipitating Factors

In many suicides, a triggering event—one single event or series of events—leads that individual to attempt to take his or her life (Moscicki, 1997). These events, by themselves, are not sufficient to lead a healthy person to end his or her life. However, to a person who has become vulnerable to suicide, the event or set of events triggers the suicide. Existing research on suicide attempters cite precipitating factors including academic stress, chronic physical illness, death of a loved one, economic distress, family and intimate partner relationship problems, occupational stress, substance abuse, and unemployment (Wu, Su & Chen, 2009; Beautrais, 1997). These factors were among those being experienced by decedents according to interviewees in the current study.

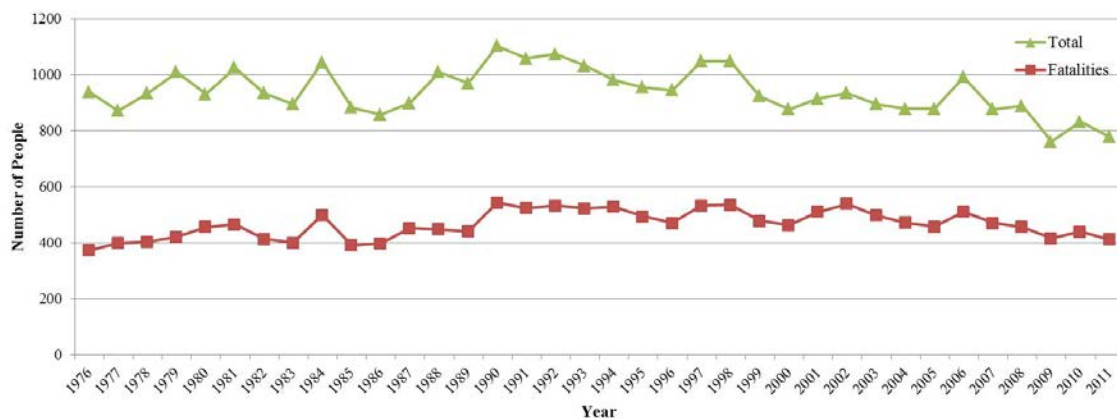
In 51 (94 percent) of 55 cases, the decedents were believed to have been experiencing at least one known stressful or adverse event. In 19 (35 percent) cases, it was fear of an upcoming negative or humiliating event, such as a court hearing, an expectation of incarceration, or loss of custody of children. Additionally, it was found that 8 (15 percent) had experienced the dissolution of a relationship with a significant other in the weeks or months prior to their death. In fewer than five cases, no precipitating factors were identified.

3.1.7 Past Attempts

The most significant predictor of a future suicide is a past suicide attempt (Runeson, Tidemalm, Dahlni, Lichtenstein, & Langstrom, 2010). Results of this study show that 24 (44 percent) decedents attempted suicide at least once in the past. Some decedents, using both high and low lethality methods, had attempted suicide multiple times.¹⁰ Of the decedents who had made one or more known prior suicide attempts, 19 (79 percent) had used at least one low lethality method (e.g., ingestion pills, poison) and 11 (46 percent) had used at least one high lethality method (e.g., jumping). Almost half (5) of the individuals who made a high lethality prior suicide attempt had tried, in that prior attempt, to end their lives on railroad rights-of-way.

It should be noted that some individuals who are involved in incidents on the railroad rights-of-way do not die from these incidents. According to FRA, on average, 900 individuals are struck annually by trains while trespassing on the railroad rights-of-way. Of these trespasser incidents, approximately half result in a fatality. As Figure 2 indicates, not all attempts to end one's life on the railroad rights-of-way result in a fatality. It is important to note that this graph includes all trespasser events (intentional and unintentional), so it is unclear what percentage of the intentional acts resulted in a fatality. Ultimately, being struck by a train does not necessarily result in a fatality. Also, this study did not investigate known attempts that did not end in a fatality. Examining the occurrence of known attempts that did not result in a fatality may uncover important information about why these attempts were made, however, funding did not allow for this investigation to be performed.

Figure 2. Trespasser Incidents vs. Trespasser Fatalities^{11, 12, 13}



¹⁰ High lethality methods refer to those methods that are generally fatal—e.g., firearms, hanging. Low lethality measures refer to those methods that are less likely to result in death—e.g., cutting the wrist, poisoning with Tylenol.

¹¹ <http://safetydata.fra.dot.gov/officeofsafety/publicsite/summary.aspx>

¹² FRA, Railroad Safety Statistics Annual Report, 1997-2009, Tables 1-2, 10-3.

¹³ FRA Accident/Incident Bulletin, 1980-1996, Table 13.

3.1.8 Characteristics of the Suicide

Witnesses. A completed suicide on the railroad right-of-way can be a very public event, depending on the site and time of day the death occurred. Completed suicides on railroad rights-of-way are categorized by Symonds, as private (likely not witnessed) or public (likely witnessed) (Symonds, 1994). In the United Kingdom, 64 percent of completed suicides on railroad rights-of-way occur in public settings, while only one-third occur in a secluded environment. A completed suicide at a station platform is almost always witnessed by passengers and railroad personnel.

In this study, 54 of the 55 cases occurred on open track away from a train station. In one case, the decedent was witnessed stepping off the platform. Of the cases that occurred away from a station, informants reported that 23 (42 percent) decedents had been observed by members of the community in the vicinity of the site of their death within 30 minutes before their death. While most completed suicides on railroad rights-of-way are witnessed by the train engineers, among the individuals studied, the actual event was only directly witnessed by bystanders in 6 (11 percent) cases.

Time of Day. An individual who attempts suicide on the railroad right-of-way during daylight hours may increase the chances of being seen and possibly rescued. The suicides in this sample occurred most frequently in afternoons and early evenings. Though daylight hours vary significantly across the country and at different times of year it is likely that for a fair proportion of these deaths, there was the possibility for the incident to be witnessed. This means that with increased monitoring, it may have been possible for these suicides to have been prevented. However, as noted above, only 6 of these 55 cases were witnessed by an observer, suggesting that decedents, for the most part, took precautions to avoid being seen. The analysis of incidents by time of day was performed in an earlier demographics profile study and no pattern emerged (FRA, 2011).

Behavior on Tracks. Completed suicides on railroad rights-of-way can be characterized as follows: jumpers (those who leap in front of an approaching train), liers or prostraters (those who lie across the tracks awaiting a train), or wanderers (those who walk on the train tracks). This information was collected for 50 of the 55 cases in the study. According to the data, 20 (36 percent) of the decedents were categorized as liers, 15 (27 percent) were jumpers, and 15 (27 percent) decedents were wanderers who faced the train directly. In the *SOVRN* study, the most common behaviors were standing on the track (wanderers) followed by jumping in front of the train.

3.1.9 Personal Possessions at Time of Death

Reports on decedents' possessions at the time of death were available in 29 of 55 cases or 52 percent of the study sample. In 7 (24 percent) of these cases, decedents had no possessions with them. In 9 (31 percent) cases, decedents had their wallet or purse with their identification. Fewer than five decedents were reported to have a cell phone with them.

The lack of a cell phone may suggest that any prevention program focused on displaying signage to encourage suicidal individuals to call a dedicated suicide prevention call center would need to include a dedicated telephone and not presume that the individual had a

cell phone in his or her possession. However, informants anecdotally reported some instances where the decedent had visited the railroad tracks prior to the actual incident, which, in theory, provides multiple opportunities to see the sign and make the call from another telephone.

When left, notes can offer a glimpse into the mindset of the decedent in the hours or days preceding the suicide, when—it is presumed—these notes are written. In this sample, 16 (29 percent) left a suicide note, which is in line with the findings of 33 percent of those who die by suicide by all means (Haines, Williams, & Lester, 2011). Fewer than five of these individuals had the note on their person, while the remaining notes were around elsewhere, e.g., in the decedents home, car, or near the site.

3.1.10 Site Accessibility and Significance

Investigators were able to explore the characteristics of the sites in 52 (95 percent) of 55 cases. Of the cases in the study sample, 46 (84 percent) occurred on stretches of track that did not have a barrier to restrict access to the railroad right-of-way. Investigators were asked to characterize each site relative to its density¹⁴ (i.e., number of buildings versus open space) on a 3-point scale from low to high density.¹⁵ Of the cases studied, based on the subjective classification of sites, 27 (49 percent) occurred in a high density area, 13 (24 percent) in an area of medium density, and 15 (27 percent) in an area of low density. Additionally, investigators were asked to classify these sites as rural, suburban, or urban.¹⁶ It was subjectively reported that 11 completed suicides (20 percent) occurred in rural areas, 30 (55 percent) occurred in suburban residential areas, and 14 (25 percent) occurred in urban areas. These findings indicate that the majority of these completed suicides occurred in or near high density, metropolitan, or suburban areas (population centers).

Additionally, of the 46 cases for which site characteristics were available, 40 (87 percent) of the decedents lived within 2 miles of the incident site—and 35 (76 percent) of these decedents lived less than 1 mile from the incident site.¹⁷

3.1.11 Availability of Firearms

In the United States, the most common method for suicide is the use of a firearm.¹⁸ The majority of suicides are the result of the use of a firearm (50.8 percent of all suicides in

¹⁴ Based on the number of buildings per square mile, block, etc.

¹⁵ Definitions of density used by investigators: low (sparse buildings, lots of space), medium, high (lots of buildings, very little open space).

¹⁶ Definitions of area type used by investigators: rural (open, like fields or woods), suburban (residential), urban (downtown).

¹⁷ In nine cases, the decedent's residence at the time of death was unknown or the decedent was transient, so proximity to residence could not be calculated.

¹⁸ http://www.cdc.gov/injury/wisqars/fatal_injury_reports.html

2009). In many instances, if a firearm is readily accessible in the home, the individual intending to complete suicide by firearm will die at home (Maris, Berman, and Silverman, 2000). Current estimates indicate that firearms are owned by roughly 38 percent of U.S. households (Hepburn, Miller, Azrael & Hemmenway, 2007).

Informants were asked if the decedent had ready access to a firearm and ammunition. For the purposes of this study “having access to a firearm” was defined as being able to obtain a firearm (your own or another individual’s) and use it to end one’s life. Among the study sample, informants reported that 12 (22 percent) decedents had access to a firearm and still chose to complete suicide on the railroad right-of-way. It is notable that this proportion is less than expected, given the proportion of U.S. households owning a firearm. However, it is worth noting that the total number of non-firearm suicides who did in fact have access to a firearm, a potentially more meaningful comparison group, is not currently known. Although we do not know how accessible firearms were to the decedent, the decision to complete suicide on a railroad right-of-way may have been at least partially dictated by the absence of a more lethal alternate means.

4. Discussion

The goal of this study is to assess whether there are unique factors that affect or influence individuals who complete suicide on railroad rights-of-way compared with suicides by other means. If such characteristics do exist, that information may inform future countermeasure or intervention strategy development.

As described in Section 3, the psychological autopsy protocol aimed to identify characteristics of individuals who complete suicide on railroad rights-of-way. In general, the characteristics of the decedents in this study were very similar to characteristics known about decedents who used other methods of suicide. Still, there are a few pieces of information that stand out as possible differences with this population:

- Many of the decedents in this study had a last known address in close proximity to railroad rights-of-way (87 percent within 2 miles, for 46 of the 55 cases where this information was available). Though the typical distance from a railroad track is unknown for suicides by other means, accessibility and availability of a means to complete suicide are significant determining factors in choice of method.
- Fewer decedents had access to firearms than would be expected given national statistics on household firearm ownership. Suicide by firearm is the most common method of suicide in the United States. Although 38 percent of U.S. households have a firearm, a much lower percentage (22%) of individuals in this study had access to a firearm. A lack of easy access to such a widely used method of suicide may increase the likelihood of an individual turning to an alternative method, such as the railroad right-of-way.
- Choosing a violent method, such as suicide by rail, has been associated with substance abuse or dependence and psychotic disorders (Dumais, Lesage, Lalovic, Séguin, Tousignant, Chawky, & Turecki, 2005). The individuals included in this report were more likely to have a mental disorder (96 percent) or a drinking (62 percent) or substance abuse (58 percent) problem than individuals who chose other suicide methods.

In addition to the aforementioned characteristics, additional information came out of this study which may be useful for the development of countermeasures.

- Incidents tended to occur in urban and suburban areas with relatively high building density. This may help to identify where initial intervention or countermeasure efforts might be focused.
- Incidents did not tend to occur at any particular time of the day. In general, more of the events occurred in the afternoon and early evening than any other time. Although only a few (6) incidents in this report were witnessed, the fact that the incidents often take place during the day indicates that individuals do not typically rely on the cover of darkness to complete the act.
- Fewer than five decedents in this study had a cellular phone in their possession at the time of their death. This may be important for developing countermeasures such as signage which require the individual to call a dedicated help line. However, if the help line number is easy to remember, individuals without a cell phone who visit the

site prior to the planned? incident may still be able to call the help line from another telephone.

- Familiarity could be a factor in choice of method. Five decedents had previously attempted suicide by rail. Individuals who attempt to end their lives on the railroad rights-of-way are likely to attempt such an act again.

Limitations. This study offers an assessment of completed suicides on railroad rights-of-way. However, because it lacks a controlled comparison group of non-suicides or suicides by other means, the study cannot offer definitive conclusions about these deaths as differentiated from uncompleted suicides on railroad rights-of-way or suicides by other means. The findings are further limited by the inaccessibility of and lack of cooperation on the part of healthcare workers who were asked but failed to supply medical and mental health records for these decedents. The study also did not include any interviews with train crews or first-responders because access was not provided; investigators relied instead on police reports that summarized those observations.

Psychological autopsy studies rely heavily on interviews with knowledgeable informants. In this study, researchers discarded six cases about which they felt that the quality of the informants' knowledge and observations was either suspect or weak. That said, there remains some degree of variability from case to case in terms of the depth of informants' knowledge, their familiarity with proximal events, the relative recentness of their observations regarding these decedents, and the exact questions that the investigators asked throughout the interview process. A number of decedents in these cases were not involved in a significant relationship at the time of their death; this created some difficulty in locating the best possible informants for the individuals. Having multiple informants for each case would at times lead to conflicting or discrepant observations that had to be resolved, either by further questions to the informants or by the investigator's best judgment in discussion with the research team. In none of the cases studied were the informants noted to be deliberately providing false information. An explanation was sought when there was discrepancy between informants and this resolved the differences in many of the cases.

Another difficulty with the psychological autopsy process is that the next-of-kins' perceptions of how the decedent behaved leading up to the completed suicide may have been clouded by the event. Thus, as a way to justify the outcome, the next-of-kin may offer reasons for why he or she *thought* the individual completed suicide, but those reasons are likely not actual observations about the decedent's behavior leading up to the incident. In light of this, the results of this report deal only with factual information and not with more subjective information.

In a few cases, key informants were unavailable, and others were considered to be insufficiently knowledgeable about the decedent. In addition, the use of multiple investigators increases the potential for variability in interviewing skills, styles, and, therefore, findings. Monthly teleconferences were held for investigators to receive feedback on reports submitted to date. Additionally, a mid-course, follow-up training of investigators was held to attempt to mitigate the variability issue. It should be noted,

however, that any changes in interview style and data gathering that resulted from such mid-study training sessions would not be reflected in any earlier cases.

Suicides on railroad rights-of-way are not coded by specific method in national (or international) databases; however, they are included in the overall totals. They are coded as “intentional self-harm by jumping and lying before a moving object” and there is no identification of what that moving object may be (e.g., train, car, bus).

Geographical bias may have been introduced into the sample in at least two ways. Because some States had lengthy procedures for obtaining data and all cases were included without sampling, a State that provided complete data continually and early in the process was likelier to be represented differently from one that provided data just prior to the cut-off for case recruitment. In addition, not all medical examiners complied with the researchers’ request for confirmation of the manner of death, citing local or State restrictions that they felt excluded their determination from public information access laws. Thus, a county or State was likely to be underrepresented if investigators could not obtain confirmation that the cases in question had been determined to be suicides and not accidents.

Despite the limitations listed above, this data collection was still able to uncover information that was not previously available in the United States, including the presence of mental disorders and substance abuse among the individuals who complete suicide on the railroad right-of-way. This is the first time that a detailed suicide data collection has been attempted across the United States on railroad rights-of-way. As such, this effort has provided FRA not only with an understanding of some of the defining characteristics of individuals who complete suicide on railroad rights-of-way, but also with information about some of the challenges that arise when collecting detailed information about these events. The lessons learned from this study will be valuable for developing systematic and reliable data collection efforts in the future.

5. Conclusions

Suicides on railroad rights-of-way are relatively rare events, but have lasting impact on witnesses, discoverers, train crews, first responders, and surviving loved ones. Moreover, they cause significant economic consequences for both the railroads (schedule delays, damage to equipment, train crewmember leave, etc.) and society. Identifying potential means to prevent these deaths will be of great benefit to all involved.

This sample of completed suicides on railroad rights-of-way shares much in common with samples of suicides by other means and, in many respects, merely confirms what we already know about those who intentionally take their lives. However, much has been learned through this effort. Notably, the cases studied involved decedents who tended to live near railroad tracks, were less likely to have access to firearms, and were significantly compromised by both severe mental disorder and substance abuse. Additionally, it is important for the development of countermeasure or intervention plans to note that the majority of these suicides occurred in urban or suburban areas (as opposed to rural). They also occurred during both daylight and nighttime hours. A summary of the findings from this effort are included below in Table 3.

Suicidal behavior is the end point on a complex pathway made up of many variables which include long-term vulnerability, an absence of protection, the overwhelming intensity of acute symptoms, and the press of stressful events, all of which ultimately lead to a loss of meaning, purpose, identity, and hope. We believe that the findings from this study may add to our understanding of suicide, and may inform the development of countermeasures that discourage individuals from completing such an act on railroad rights-of-way.

A follow-up document which details potential countermeasures to address suicides is currently being developed by FRA and should be available within the next year. This document will incorporate the information obtained in this report to determine the most effective ways to implement proposed countermeasures in order to maximize their likelihood of success.

Table 3. Summary of Findings

Attribute	Data from Psychological Autopsy of 55 Decedents
<i>Gender</i>	84% male 16% female
<i>Age</i>	33% 30 years old or younger 40% between 31 and 50 years old 27% older than 50 years
<i>Race</i>	96% white 4% nonwhite (IRB restrictions limit the ability to discern quantities smaller than 5)
<i>Sexual Orientation</i>	>90% identified as straight <10% identified as gay, lesbian, bisexual, or transgender
<i>Marital Status and Offspring</i>	56% single and never married 20% divorced or separated 15% married at the time of death 9% widowed or cohabitating (IRB restrictions limit the ability to discern quantities smaller than 5)
<i>Geographic Distribution</i>	The distribution of the suicides that were studied in this effort was spread across the United States.
<i>Employment Status</i>	43% full- or part-time employment <ul style="list-style-type: none"> ➤ 19% professional jobs ➤ 27% service industry ➤ 25% laborers ➤ 13% temporary jobs
<i>Government System Involvement</i>	47% involved in nonmedical social system, e.g., welfare or criminal justice system at time of death 15% involved with legal system at time of death

<p><i>Mental Disorder</i></p>	<p>96% reported to have had a mental disorder</p> <ul style="list-style-type: none"> ➤ 47% had been prescribed medications <ul style="list-style-type: none"> • 40% of these had been reported to have been taking these medications and only half of those were reported to have been effective ➤ 73% reported to have had two or more co-occurring ➤ mental disorders <ul style="list-style-type: none"> • 25% of those with co-occurring mental disorders were reported to have been in therapy <p>64% reported to have had a family member with a mental disorder</p>
<p><i>Physical Disorder</i></p>	<p>51% at least one chronic physical illness, including diabetes, chronic pain, cardiovascular disease, endocrine disorders, brain injury, and asthma</p>
<p><i>Substance Abuse and Toxicology Reports</i></p>	<p>62% reported to have been heavy consumers of alcohol 58% reported to have been abusing drugs</p> <p>Toxicology Reports (for 43 of the 55 cases)</p> <ul style="list-style-type: none"> ➤ 51% positive readings <ul style="list-style-type: none"> • 37% positive for alcohol • 16% positive for illicit drugs • 16% positive for prescription drugs
<p><i>Precipitating Factors</i></p>	<p>94% reported to have experienced at least one stressful and/or adverse event</p> <ul style="list-style-type: none"> ➤ 35% upcoming negative or humiliating event (court hearing, incarceration, loss of custody) ➤ 15% dissolution of relationship
<p><i>Past Attempts</i></p>	<p>44% had attempted suicide at least once in the past</p> <ul style="list-style-type: none"> ➤ 79% had used at least one low lethality method ➤ 46% had used at least one high lethality method ➤ 9% had attempted on the right-of-way in the past

<i>Witnesses</i>	<p>96% occurred on open track (away from a station)</p> <p>42% had been observed by community members in the vicinity of the tracks prior to the incident</p> <p>11% were witnessed directly by bystanders</p>
<i>Time of Day</i>	<p>Most frequent in afternoon and early evenings. However, there was not a clear pattern for when these incidents occur.</p>
<i>Behavior on Tracks</i>	<p>36% were lying on the tracks</p> <p>27% jumped onto the tracks</p> <p>27% were wandering along the tracks facing the train</p>
<i>Personal Possessions</i>	<p>Data only available for 29 (52%) or cases</p> <ul style="list-style-type: none"> ➤ 24% of these cases had no possessions ➤ 31% of these cases had a wallet or purse with ID ➤ <17% had a cell phone (IRB restrictions limit the ability to discern quantities smaller than 5)
<i>Site Accessibility and Significance</i>	<p>49% in high density areas</p> <p>24% in medium density areas</p> <p>27% in low density areas</p> <p>20% in rural areas</p> <p>55% in suburban residential areas</p> <p>25% in urban areas</p>
<i>Availability of Firearms</i>	<p>22% reported to have had access to a firearm</p>

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Abbreviations and Acronyms

AAR	Association of American Railroads
AAS	American Association of Suicidology
AIDS	Acquired Immune Deficiency Syndrome
BAC	Blood Alcohol Content
CDC	Center for Disease Control
FRA	Federal Railroad Administration
ME	medical examiner
RRF	Railroad Research Foundation
SOVRN	Suicides and Open Verdicts on the Railway Network
U.S.	United States