

Remedial Actions to Prevent Suicides on Commuter and Metro Rail Systems



MTI Report 12-41



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REPORT 12-41

REMEDIAL ACTIONS TO PREVENT SUICIDES ON COMMUTER AND METRO RAIL SYSTEMS

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March 2016

A publication of

Mineta Transportation Institute

Created by Congress in 1991

College of Business
San José State University
San José, CA 95192-0219

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. CA-MTI-14-1129	2. Government Accession No.	3. Recipient's Catalog No.			
4. Title and Subtitle Remedial Actions to Prevent Suicides on Commuter and Metro Rail Systems		5. Report Date March 2016			
		6. Performing Organization Code			
7. Authors Patrick Sherry, Ph.D.		8. Performing Organization Report MTI Report 12-41			
9. Performing Organization Name and Address Mineta Transportation Institute College of Business San José State University San José, CA 95192-0219		10. Work Unit No.			
		11. Contract or Grant No. DTRT12-G-UTC21			
12. Sponsoring Agency Name and Address <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> California Department of Transportation Division of Research, Innovation and Systems Information MS-42, PO Box 942873 Sacramento, CA 94273-0001 </td> <td style="width: 50%; border: none;"> U.S. Department of Transportation Office of the Assistant Secretary for Research and Technology University Transportation Centers Program 1200 New Jersey Avenue, SE Washington, DC 20590 </td> </tr> </table>		California Department of Transportation Division of Research, Innovation and Systems Information MS-42, PO Box 942873 Sacramento, CA 94273-0001	U.S. Department of Transportation Office of the Assistant Secretary for Research and Technology University Transportation Centers Program 1200 New Jersey Avenue, SE Washington, DC 20590	13. Type of Report and Period Covered Final Report	
		California Department of Transportation Division of Research, Innovation and Systems Information MS-42, PO Box 942873 Sacramento, CA 94273-0001	U.S. Department of Transportation Office of the Assistant Secretary for Research and Technology University Transportation Centers Program 1200 New Jersey Avenue, SE Washington, DC 20590		
14. Sponsoring Agency Code					
15. Supplemental Notes					
16. Abstract <p>The present study reviewed current efforts of commuter railroads to reduce or prevent suicide on railways and discussed preventative activities affecting rail related suicides. Primary preventative methods have included erecting physical barriers, posting warning signs with telephone numbers for hotline crisis counseling, using video surveillance on platforms, and training key personnel to identify and intervene with at-risk individuals. However, little or no evidence has been reported to demonstrate the efficacy of these methods.</p> <p>The present study also sought to provide information about community awareness and attitudes toward suicide on the railroads and survey data collected from 498 respondents demonstrate that community members feel a strong sense of responsibility for assisting those who are suicidal. However, survey data also revealed a lower sense of self-confidence in knowing what to do to be helpful.</p> <p>Pre-post surveys of railroad personnel involved in workplace suicide prevention training programs examined the effects of an employee training program with a large commuter railroad designed to identify and prevent rail related suicide. Results demonstrated that people who completed training obtained higher levels of self-efficacy with respect to understanding, identifying, and assisting people who appeared to be at risk for suicide. Program participants also demonstrated knowledge of the signs and symptoms and risk factors for suicide.</p> <p>Recommendations for prevention strategies include continued efforts to identify hotspots and to erect barriers to reduce access to the railroad right-of-way, and for installing signage with warnings and contact information for crisis services. The use of drones equipped with video monitoring systems working in tandem with trespasser intrusion alert technology could be one way of dealing with more remote locations. Training programs for railroad employees designed to increase their confidence and skill intervening with suicidal individuals is also needed. Additionally railroads should maximize their prevention efforts by partnering with other groups devoted to preventing suicide as well as with government agencies. Suicide is a community-wide concern, community residents feel some responsibility for prevention, and railroads should not be expected to be the sole source of preventive activities for intentional fatalities by rail.</p>					
17. Key Words Critical incidents; Epidemiology; Railroad safety; Suicide prevention; Trespassers		18. Distribution Statement No restrictions. This document is available to the public through The National Technical Information Service, Springfield, VA 22161			
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 99	22. Price \$15.00		

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Library of Congress Catalog Card Number:
2016934532

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ACKNOWLEDGMENTS

The authors thank MTI staff, including Executive Director Karen Philbrick, Ph.D.; Publication Support Coordinator Joseph Mercado; and Editor and Webmaster Frances Cherman.

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EXECUTIVE SUMMARY

Railway suicides have received increased attention of late, and efforts to understand and address the issues have been initiated by the US Department of Transportation (USDOT), the Federal Transit Administration (FTA), and the Federal Railroad Administration (FRA), as well as the Association of American Railroads. Local officials from agencies such as the Chicago Metra and Washington DC Metro (WMATA) noted significant concerns about suicide between 2008 and 2013 (Wronski, 2014). Research from the World Health Organization (WHO) shows that suicide is ranked as the tenth leading cause of death worldwide. In the US, the suicide rate was double the homicide rate for people 25-44 years old and nearly seven times the homicide rate for those over 65 years of age. A review of the literature identified that the suicide rate for males in the US is four times that of females. According to the FRA, about 53% of suicides on US railways occur among males under 40 years of age, about a quarter of whom have alcohol involved in the event. Surveys have also revealed that nearly 90% of people who died by suicide suffer from depression and other mental disorders, including substance abuse. In addition, a number of studies have demonstrated a strong relationship between suicide rates and economic conditions including unemployment, mass layoffs, length of unemployment, and other socio-economic factors related to a breakdown or deterioration in the social structure. Based on the review of the literature, the present study identified the following key characteristics of people likely to die by suicide on US railways:

1. Male and under 50 years of age
2. Have had or are having some involvement with alcohol and or drugs
3. Highly likely to be suffering from depression or other mental disorder
4. Highly likely to have a substance abuse disorder
5. Likely have no other means of suicide (i.e., firearms)
6. Likely to seek access to high-density, regularly scheduled train traffic areas
7. Likely to live within close proximity (1 to 3 miles, or 1.61 to 4.83 km) of the railroad, either living alone or renting
8. Highly likely to have been experiencing economic or financial stressors for some time (e.g., layoffs, unemployment, recession, debts, etc.)

The study reviewed current efforts of commuter railroads to reduce or prevent suicide on railways. These methods have consisted primarily of erecting physical barriers, posting warning signs with telephone numbers for hotline crisis counseling, using video surveillance on platforms, and training key personnel to identify and intervene with at-risk individuals. However, little or no evidence has been reported to demonstrate the efficacy of these methods. Two other factors were identified as posing a considerable obstacle for preventing suicide: media reports that trigger copycat efforts, and economic

conditions such as unemployment. Several studies demonstrated a significant increase and correlation between media reports of suicides and a subsequent increase in so-called copycat suicides. Reporting standards have been promoted by several international agencies and efforts to reduce and carefully manage the publicity of news about suicide to prevent copycat effects are also underway. Several large scale studies in the US and Europe have demonstrated a strong correlation between economic conditions and the occurrence of suicide. In fact, researchers presented statistical models that show a direct reduction in the likely occurrence of suicide as a result of specific interventions in reducing unemployment or financial hardship.

The present study also sought to evaluate the effectiveness of an ecologically-oriented suicide prevention, awareness, and intervention-training program in which a wide range of railroad stakeholders are engaged to prevent suicide. Bean & Baber (2011) described an ecological approach that involved “training individuals in all of the microsystems” (pg. 89). Surveys were administered to employees of two commuter railroads that participated in the training programs. Results of the assessment demonstrated that people who completed training obtained higher levels of self-efficacy with respect to understanding, identifying, and assisting people who appeared to be at risk for suicide. Program participants also demonstrated knowledge of the signs and symptoms and risk factors for suicide.

In addition, the present study also sought to provide information about the community awareness and attitudes toward suicide on the railroads. Educational efforts at five different locations were accompanied by surveys of community members to assess the awareness level of suicide on the railroads and the risk factors associated with suicide attempts and completions. Results of the assessment of community attitudes demonstrate that community members feel a strong sense of responsibility for assisting those who are suicidal. However, survey data also revealed a lower sense of self-confidence in knowing what to do to be helpful.

Recommendations for prevention strategies include continued efforts to identify hotspots and to erect barriers to reduce access to the railroad right-of-way, and for installing signage with warnings and contact information for crisis services. The use of drones equipped with video monitoring systems working in tandem with trespasser intrusion alert technology could be one way of dealing with more remote locations. Training programs for railroad employees designed to increase their confidence and skill intervening with suicidal individuals is also needed. Additionally, it was suggested that railroads focus their prevention efforts by partnering with other groups devoted to preventing suicide as well as with government agencies. Suicide is a community-wide concern, community residents feel some responsibility for prevention, and railroads should not be expected to be the sole source of preventive activities for intentional fatalities by rail. It also would be beneficial to expand training to include merchants and other key people *in the community* who can also assist with suicide prevention activities and identify potential victims.

Recommendations

Recommendation 1

This study suggests the need for ongoing and continuing training of railroad employees regarding warning signs and risk factors for suicide. Training will increase awareness and self-efficacy for assisting those in need.

Recommendation 2

Suicide-awareness training programs should set clear boundaries and guidelines for railroad employees regarding their responsibility and what is expected and not expected in specific roles. People who have immediate customer-facing roles are likely to be expected to have more responsibility to assist or intervene.

Recommendation 3

Individuals using the railroad as a means of intentional self-harm have differing demographic characteristics and different reasons for being in harm's way. Thus a one-size-fits-all approach to prevention will not succeed. A multi-faceted and multi-agency approach will be needed.

Recommendation 4

Barriers are needed but not sufficient, as some individuals who are intent upon self-harm will circumvent the barriers.

Recommendation 5

Community identification, consultation, and engagement with people who live and reside in the immediate area who are dealing with alcohol and substance abuse or some form of mental disorder would likely be of value.

Recommendation 6

Anticipate increases in numbers of suicides when economic conditions are poor, and develop more aggressive outreach programs.

Recommendation 7

Community members and organizations should be encouraged to take a more active role in suicide prevention.

Recommendation 8

Suicide prevention efforts must be targeted in and around the immediate area of the railroad stations or platforms and also along railroad tracks in general because there are

few identifiable “hotspots.” Perhaps more monitoring of the tracks using remote sensing, motion detectors, and video feeds would be helpful.

Recommendation 9

It would be helpful to develop a more aggressive general community engagement effort in high-risk areas near the railroad.

Recommendation 10

The efforts of Operation Lifesaver (OLS) must be commended but expanded. The OLS personnel could also increase their discussion about the possibility of suicide, intoxication, and other forms of mental illness.

I. REMEDIAL ACTIONS TO PREVENT SUICIDES ON COMMUTER AND METRO RAIL SYSTEMS

PROJECT 1: RAILWAY SUICIDE PREVENTION EFFORTS

Overview

The goal of this project was to further investigate ways of effectively preventing suicides in the transit industry. Recent data show that there are some promising methods for reducing the occurrence of suicides in commuter and transit rail events. The purpose of this study was to: 1) review the existing literature on railway suicides; 2) evaluate the effectiveness of training programs for transit employees designed to prevent suicides; and 3) gather information about the effects of community awareness programs about suicide on the railroad.

MTI Research Area Emphasis

This project falls within the area of transportation safety and security. Railway suicides constitute a small but significant portion of fatalities in the passenger rail system. Every year a large number of individual events occur when trains hit or strike individuals who are on the tracks illegally. In addition, trespassers and individuals can gain access to the rail lines, also impacting overall rail security. Notwithstanding the tragic loss of life, according to FTA Senior Public Affairs Officer Paul Giffo, suicides “have a huge impact on both customers and employees, not only because it’s a very traumatic experience for everyone involved, but also because they can cause part of the system, or even an entire system, to shut down for hours on end” (Paisner, 2009). Shutting down the system could have disastrous impacts on general public safety and the wellbeing and welfare of many citizens. Additionally, the expansion of passenger rail in the US over the past decade and the possibility of additional expansion in the next warrant considering preventive measures that can be implemented during the construction and expansion of new service. Thus, the present study will address both the safety and security aspects of the research agenda.

REVIEW OF THE LITERATURE

Suicide

Suicide is a troubling phenomenon for Western society. Laced with social stigma and shame, survivors and relatives of suicide are reluctant to discuss the issues and behaviors associated with suicide. One hypothesis is that because of the stigma associated with suicide, progress in understanding and preventing suicide has been limited.

The present study is designed to increase general understanding of community attitudes toward suicide, identify the current approaches to suicide prevention, look at the impact of a suicide prevention training program, and make recommendations about possible best practices.

Prevalence of Suicide

According to the World Health Organization (WHO), suicide is the “act of deliberately killing oneself.”¹ The number of suicides globally has been increasing since 1950. According to Miller (2012), the suicide rate between 1955 and 2005 for the US as a whole ranged between 10.2 and 12.8 per 100,000.² Statistics tabulated by the WHO are depicted in Figure 1, with the suicide rate per 100,000 population for males increasing at a higher rate than those for females.

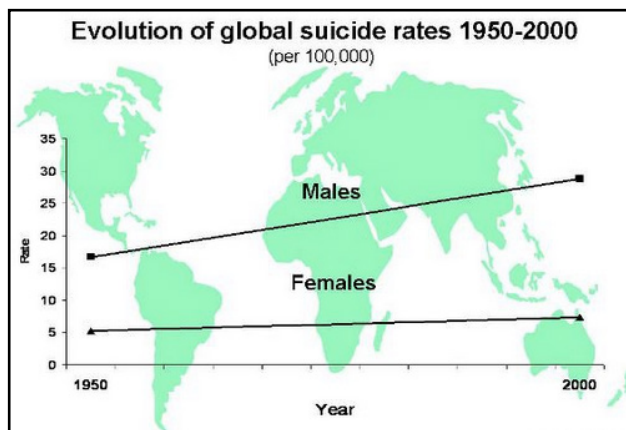


Figure 1. Global Rates of Suicide Since 1950³

In the United States, the Centers for Disease Control and Prevention (CDC) collect and analyze data on suicide and other causes of death. In 2013, the most recent year the CDC reported data, 41,149 suicides were officially tabulated, making suicide the tenth leading cause of death for Americans. Thus, in 2013 someone in the country died by suicide every 12.8 minutes, up from 13.3 in 2011.⁴ By way of perspective, the FRA reported in its trespasser casualty report a total of 773 fatalities on US railroads (Appendix 4). It should be noted that the FRA at the time did not track suicides, but a subsequent FRA study released in June 2013 determined that 27.7% of trespasser fatalities reported between 2005 and 2010 were deemed suicides by coroners or medical examiners. Thus, of the 1,321 trespasser fatalities reported by FRA between 2012 and 2014, 266 were most likely suicides, and thus for 2013, when FRA reported 310 suicides (for a suicide rate of 36% of trespasser fatalities), rail suicides accounted for 0.75% of the total number of suicides in the USA. This number should be interpreted cautiously due to the many limitations on reporting that occur. However, it is most likely an underestimate of the number of suicides on the railroads.

Characteristics of Those Who Died by Suicide

Suicide occurs with greater frequency among certain groups of individuals. It has been repeatedly documented that suicide occurs with a greater frequency among older white males. The main characteristics studied include, age, gender, geographic location, means or method of suicide, lethality of means, and social-economic factors that contribute to the occurrence.

Suicide and Age and Gender

Globally, the distribution of suicides for men and women is disproportionately higher for men versus women. Older males are four times more likely than women to die by suicide the world over than women. According to the American Association of Suicidology (AAS) (McIntosh & Drapeau, 2012), as of 2010, the data accumulated show that suicide is becoming more frequent among the 45-54 year old age group. The WHO data in Figure 2 also show the disturbing global trend for people, both male and female, over 45 years of age to have the highest rates of suicide—more than 2.2 times the rate of 15-24 year old males and more than 3.1 times the rate for females aged 15-24.

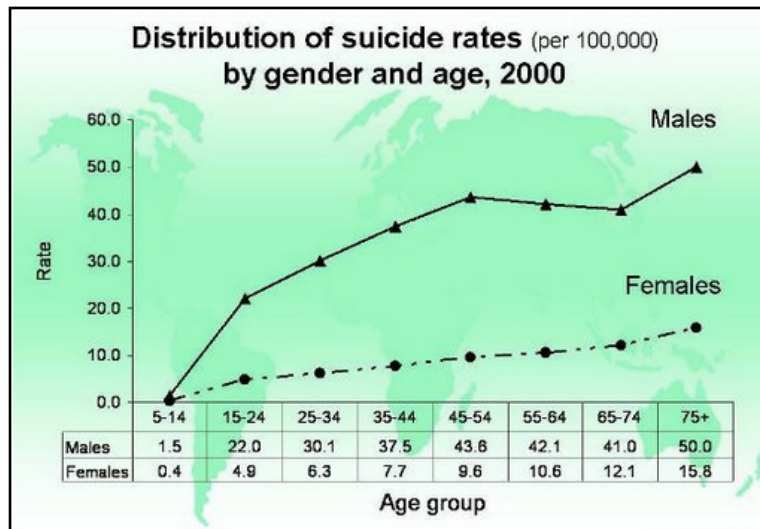


Figure 2. WHO Suicide Rates by Age and Gender⁵

Figure 3 shows, based on data from the CDC,⁶ the rates are fairly steady for people in most age groups. However, the rate of the 45-65-year group appears to be gradually increasing from 13.23 to 18.85 over the 14-year period from 2000 to 2013.

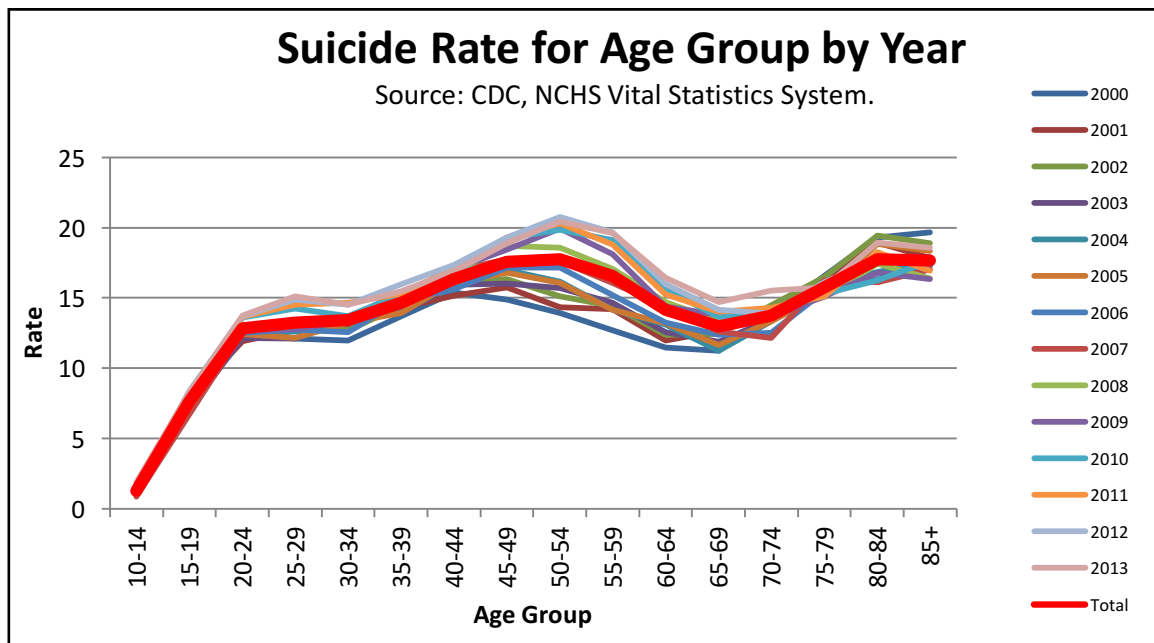


Figure 3. Suicide by Age Group 2000 to 2013

Suicide and Gender

The CDC noted that males are four times more likely to die by suicide than are females.⁷ Data published by the CDC shows that in 2013 (Figure 4) the unadjusted rate of suicide for men was 20.59%, while the rate for women was 5.67%.⁸

A recent study by Phillips (2014) concluded that while suicide rates decreased somewhat in the 1980s and 1990s, they have been increasing for males born in the “Baby Boomer” generation over the past decade. Baby Boomers, born between the end of WWII and 1964, have started a new pattern. Phillips noted that, “This is a striking new trend. ... Since the 1930s and up to the 1990s, suicide rates among ... people aged 40 to 59 were declining or pretty stable. But after 2000, this picture changed dramatically”⁹ She concluded that, “[W]e have a new epidemiology of suicide whereby middle-aged suicide rates exceed those for the elderly” (Phillips, 2014, page 158).¹⁰

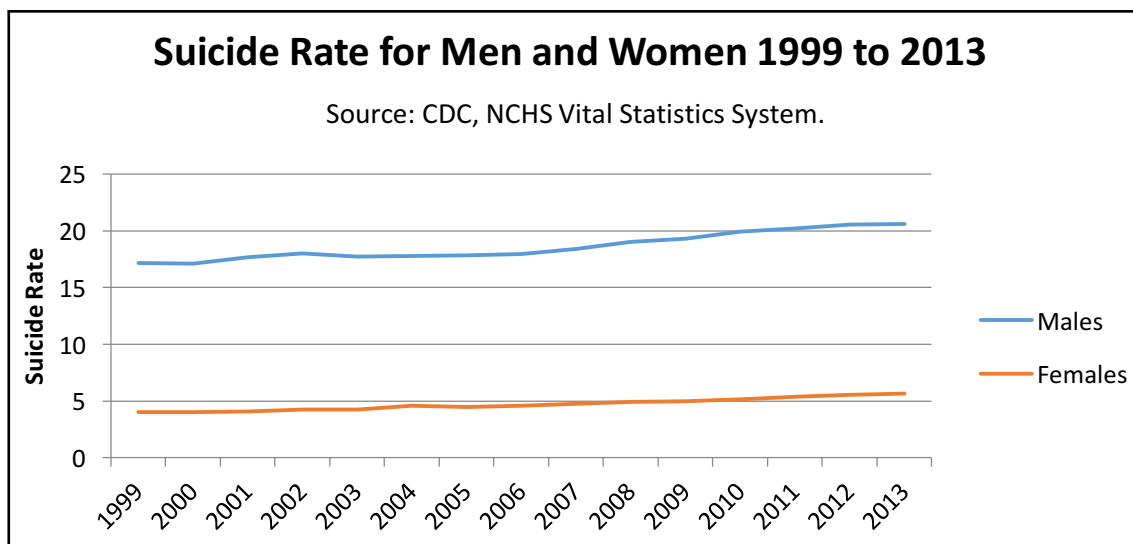


Figure 4. Suicide Rates since 1999, Males vs. Females

Suicide and the Economy

Ever since Emil Durkheim published his groundbreaking socio economic study *Suicide* in 1897, researchers have speculated about the various contributions that the economy has had on suicide rates. Recent research by Stack (2000) has found some change in the suicide rates from the time of the Great Depression in 1933, when the rate was at 17.4 per 100,000. Some have reported that the suicide rate for the unemployed is more than twice that of those who are fully employed. “When combined with the loss of job, home loss has been found to be one of the most common economic strains associated with suicides.”¹¹ More recent reviews of the literature have found additional and continued support for the relationship between suicide and economic strain.¹²

Statistics reported by the CDC indicate that the suicide rate varies according to economic conditions. A retrospective study investigating suicide rates from 1928 to 2007 showed a strong correlation between economic condition and suicide among the working age population. The authors concluded that the suicide rate rose in the Great Depression (1929-1933), the Oil Crisis of 1973-1975, and the Recession of 1980-1982. Suicide rates fell during WWII (1939-1945) and decreased during the long economic upswing between 1991-2001.¹³

Related to economic indicators is the finding that suicide rates are higher in rural areas than in urban areas. Singh (2014) reported that the affluent metro area versus the poor non-metro area suicide rates were 9.05 versus 13.66, respectively, in the period between 2005-2009. In fact, the relative risk of suicide between 1990 and 2007 increased from 1.15 to 1.37. Significant relationships between poverty and all-cause mortality were also found when race and poverty were considered together. Results also indicated that poor blacks in non-metropolitan areas experience two to three times higher risk of death by any cause than affluent blacks and whites in metropolitan areas (Singh & Siahpush, 2014).¹⁴

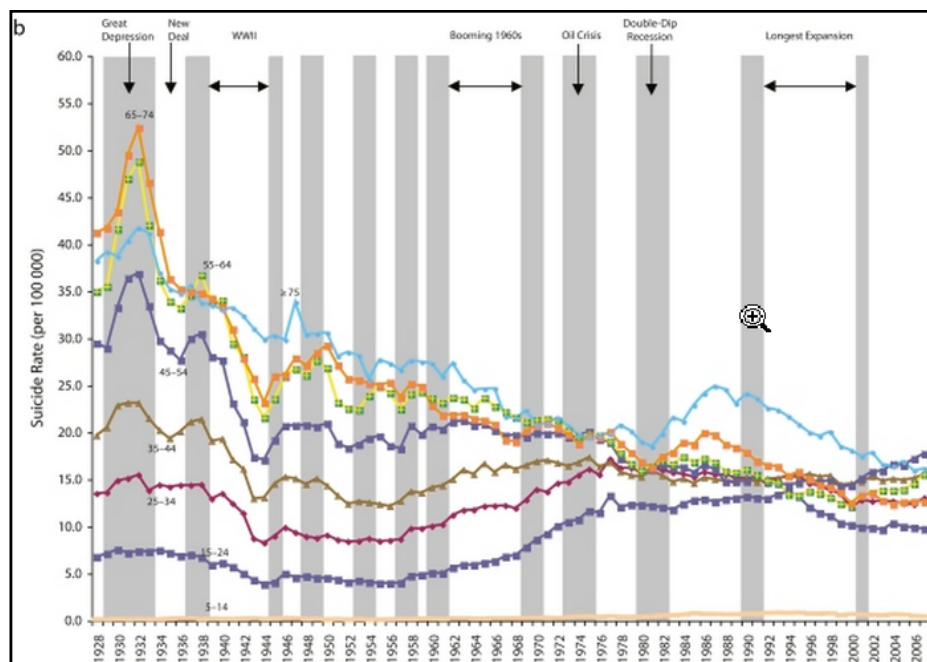


Figure 5. Suicide Rates between 1928 and 2007 (Permission pending)

The CDC also reported additional findings in 2013 in which the number of deaths due to suicide was greater than the number of deaths due to highway vehicle crashes.¹⁵ Several CDC researchers conducted a comprehensive study of the suicide rate between 1928 and 2007. Their analysis used both graphical and statistical techniques to analyze the data. The chart is reprinted (Figure 5) from their publication (permission requested), and it shows quite dramatically the change in rates during the various economic upturns and downturns. More interesting, however, are the results of the statistical analysis that show a significant correlation between suicide rates and unemployment rates.¹⁶ The suicide rates for the various age cohorts was significantly correlated with the national unemployment rate, with correlation coefficients as high as $r=.61$ ($p<.001$) to $r=.33$ ($p<.003$). The authors concluded that increases in suicide rate were significantly correlated with economic recessions.¹⁷

Another interesting study by Rehkopf & Buka (2006) examined the research literature from 1897 to 2004, identifying over 85 studies that provided analyzable data. The results of their meta-analysis concluded that poverty and economic deprivation in various geographic areas were most likely inversely correlated with suicide rates. In addition, median income for an area was also negatively correlated with suicide rates. Measures of unemployment, education, and occupation were also negatively correlated with suicide rates.¹⁸ These results suggest that prevention efforts must be targeted at regions and locations that have economic hardship and distress.

Luo, Florence, Myriam, Lijing, & Crosby (2011) studied the relations between age and business cycles in the US and the occurrence of suicide rates between 1928 and 2007. Results of their analyses revealed significant relationships and associations between the overall suicide rate and the suicide rates of several age groups. However the relationships were not obtained in the groups aged 15-24 and 65 and older. They concluded that economic recessions require different public health responses for different age groups of individuals.

Phillips (2014) investigated the temporal and spatial factors affecting suicide rates across the US between 1976 and 2000. Her analyses revealed that a number of factors contributed to changes in rates of suicide over time and between locations. Notably, access to firearms and degree of social disorganization were factors that had differential results. Specifically, restricting gun access decreased the suicide rate, while increasing the degree of social disorganization or deterioration increased the degree of suicide. In other words, factors such as poverty and unemployment contribute greatly to the choice of method and that—while access to firearms decreases the number of suicides—degree of poverty and lack of social support are likely to work in the opposite direction. In another study, she wrote, “Applying a Durkheimian lens, I speculate that the broad social and economic changes introduced in the 1960s may have weakened traditional forms of social integration and regulation for the postwar cohorts, leading to a pattern of rising suicide rates” (Phillips, 2014).¹⁹ Therefore, when considering rail related suicide, a greater focus on the degree of social disorganization, poverty, and other factors may be an important geographical risk factor that must be considered and mitigated against.

Breuer (2014) investigated the relationship between suicide rates and unemployment in Europe. Results of regression analyses of available data from the European Union showed that the suicide rate of the total population is positively related to unemployment. The relationship is particularly strong and significant for males, and while positive, it is not significant for females. The analyses demonstrated that if unemployment rises by 1 percentage point, overall suicide rates increase by 0.09 per 100,000 inhabitants, while male suicides increase by 0.21 per 100,000 male inhabitants.²⁰

Another approach to studying the relationship between economic conditions and suicide was attempted by Chang, Stuckler, Yip, and Gunnel (2013). A significant increase in suicides was observed when the actual number of suicides in 2009, based on World Health Organization data, was compared with the number that was predicted for 2009 based on the previous eight years of WHO data. Suicide increased primarily in men in both European and American countries in which the suicide rates were 4.2% (3.4% to 5.1%) and 6.4% (5.4% to 7.5%) higher, respectively, in 2009 than expected if earlier trends had continued. Increased rates of suicide in European men were highest in those aged 15-24 (11.7%), while in North and South America men aged 45-64 showed the largest increase (5.2%). The authors noted that increases in suicide rates in men appeared to be associated with the magnitude of increases in unemployment, particularly in countries with low levels of unemployment before the crisis ($r=0.48$).

Similarly, Reeves, McKee, & Stuckler (2014) also investigated the effects of the Great Recession on suicides in the United States and estimated that the recession was associated with at least 10,000 additional suicides between 2008 and 2010.²¹ In addition, they noted that the U.S. suicide rate increased by 4.8% after the start of the recession.²² While Abbot et al. (2003) were unable to find a significant difference in the economic status of the locations of rail related suicides in the UK, over one-third of the suicides were unemployed people (36.8%).²³ Thus, the preponderance of data suggests a significant economic factor contributing to the occurrence of suicide. In terms of these findings’ relevance for railway suicide, it may be that areas affected by economic hardship and social disintegration are those more likely to see railway related suicides.

Finally, Defina & Hannon (2014) also looked at the relationship between unemployment and suicide. Examining data for 1979 to 2010, the investigators found a high significant relationship between unemployment rates over recent decades. Moreover, a relationship seems to appear between suicide and employment insecurity that should also be investigated further.

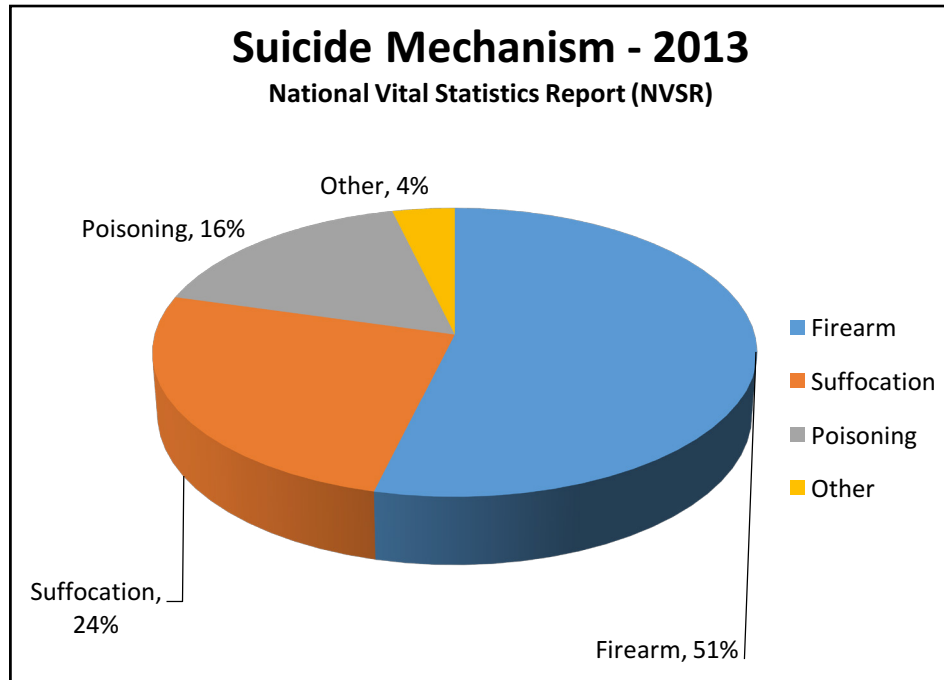


Figure 6. Suicide Methods in 2013²⁴

Suicide Methods

Statistics gathered by the CDC²⁵ have examined the types of methods that people use to commit suicide. Recently reported statistics summarizing data, including 2013,²⁶ show that the most common method of death by suicide among males is with a firearm; through suffocation for females age 10 to 24; and poisoning for females older than 25. Again, according to the most recent CDC data,²⁷ the most common method of suicide in 2013 was the use of firearms (Figure 6) (50.6%), followed by suffocation (25.1%), poisoning (16.6%), and other (7.7%).²⁸

Callanan & Davis (2012) studied gender differences in suicide between men and women. Based on data from 621 suicides from one Ohio County, the investigators looked at data from 1997 to 2006. One of the reasons given for the large difference in suicide rates for men versus women is that men are more likely to choose a more lethal means. The most frequent method for men was firearms (51%).²⁹ Interestingly, Callanan & Davis reported that the number of people who died by suicide by placing themselves in front of a train (n=11) was only 1.7% of all suicides studied. Furthermore, whereas 63.4% of men and 65.0% of women in the Southern California (Kposowa and McElvain, 2006) sample study died at home, 78.3% of men and 80.9% of women in the Ohio sample died by suicide at home. By comparison Kposowa & McElvain (2006), examining the data from Riverside

County in Southern California found that only 14 out of 643 suicides (2.2%) for both sexes occurred on railroad tracks. Interestingly, there were slight differences by gender in that 63.4% of men (317 out of 503) and 65.0% of women (91 out of 140) died by suicide at home. Additionally, 2.3% of men (11 of 503) and 2.1% of women (3 out of 140) died on railroad tracks. Thus, the authors concluded that while US homes are indeed dangerous places, people could use methods of suicide to which they have ready access. Taken together, however, these results indicate that suicide on the tracks is extremely rare, occurring in only about 2% of the population of suicides in general.

Fisher, Loverholser & Deiter (2014) also investigated gender differences in methods of suicide. All suicidal deaths (2,347) in a large urban county were analyzed for a 15-year period from 1994 to 2008. Results indicated that the majority of men used firearms and hanging, while “women used a variety of methods, including self-poisoning, shooting, hanging, and carbon monoxide poisoning.” Again, the main method of choice for males is likely to be firearms.

Summarizing these studies, while the majority of individuals will seek to use firearms as their method of choice, a very small percentage of people who eventually die by suicide will use railways as the means of intentional death possibly based on the belief that it is method that reliably results in a fatality.

Suicide Etiology

Suicide is disturbing to many, and research has been undertaken to determine the cause of suicide. For the most part, these have been retrospective studies commonly called “psychological autopsies.” The results of these studies have shown that well over 80% of people completing suicide have suffered from some sort of psychological disturbance. The Suicide.Org website states, “Over 90 percent of people who die by suicide have a mental illness at the time of their death.”³⁰ Untreated depression is the most frequently diagnosed mental illness among those dying by suicide.

According to the Association of Suicidology, most often “these disorders had not been recognized, diagnosed, or adequately treated.” In addition, “about one-third of people who took their lives did not communicate their suicide intent to anyone.”³¹ As a result of these studies, it has been recognized that the public and others who might come in contact with potential suicide should be better educated regarding the potential signs and symptoms of suicide.³²

Environmental factors, however, have been studied as precipitants of depression and suicidal behavior. Recently, a large-scale study of the effects of job loss on the risk of suicide was conducted by Classen & Dunn (2012). Their results show a very strong relationship between the length of unemployment and suicide. In addition, they also found a strong relationship between the occurrence of mass layoffs and suicide. Similarly, an Italian study of unemployed suicide completers had 17 times higher risk of financial problems in the 12 months preceding a suicide, were 10 times more likely to have had poor social support, 16 times more likely to have had any stressful life events in the past 12 months, and 22 times more likely to have a diagnosis of borderline personality disorder.³³

Taken together, these findings suggest that the presence of mood disorders and other mental disorders in conjunction with major life events and societal and economic stressors contribute greatly to the occurrence of suicidal ideation and suicidal behavior. Classen & Dunn (2012) estimated that there is likely to be an increase of one suicide for every 4,200 males who become unemployed as part of a layoff. They argued for changes in unemployment insurance that correspond with these circumstances. The reduction in suicidal behavior in their sample with the application of various preventive efforts, including counseling and unemployment insurance, were found to be cost effective.

In summary, the causes of suicide appear to be a combination of the presence of many factors including mental illness or mental distress, the occurrence of substance abuse or excessive substance use, and the influence of life events and life-stress such as unemployment, job loss, or significant financial distress.

Railway Suicide

The problem of railway suicide has received increased attention over the last twenty years. Abbot, et al. (2003), citing O'Donnell, Farmer, and Tranah (1994), reported that the first "reported railway suicide in England and Wales was in 1852." The authors state that since that time, there "have been over 15,000" railway deaths in the UK with an increase of 40% since the 1960s. The concern for railway-related suicide culminated in a conference on "Railway Suicide" in London in 1991 that later resulted in a series of papers in a special issue of *Journal of Social Science and Medicine* in 1994 on suicide prevention. A contemporary report by Hudson (1999) indicated that in the five years preceding the report's publication, the authors estimated that over 60% of the fatalities on the system were likely suicides. The SOVRN (Suicides and Open Verdicts on the Railway Network) Project Report (Abbot et al., 2003) was a response to the increasing concern over railway suicides in the UK. The report detailed a number of interviews and case studies with various stakeholders in the railway industry. The following sections summarize studies that are specifically related to suicide on the railways.

Increased attention to the topic of railway-related suicide has also been noted at several recent meetings of the International Rail Safety Conference (IRSC). The IRSC, held in Denver in 2008, included a panel discussion on this topic (Sherry, 2008). In terms of prevention, there is great interest in studying the characteristics of those who are intent on harming themselves. Having a better understanding of who is attempting and successfully completing suicide attempts can lead to more effective prevention efforts. Difficulties associated with accurately tracking the incidence of suicide have to do with difficulties in defining and recording suicide. In many cases, the circumstances are ambiguous and raise questions about accidental versus intentional death. Moreover, the involvement of alcohol, depression, and other mental disturbances can cloud the issue. Lastly, there is some social pressure to find alternatives to declaring cause of death a suicide due to concern for the family in relation to the stigma issues and also the financial consequences for life insurance policies. More recently, Mishara & Bardon (2013) also presented information on Canadian efforts to reduce railway suicides.

Characteristics and Incidence of Railway Suicides

Krysinska & De Leo (2008) reviewed the international literature on suicide by rail and found that suicide involving trains accounted for as much as 12% of all suicides. In addition, up to 94% of attempts were found to result in death and as many as 83% of the suicide completers had a psychiatric diagnosis of some type. The FRA report estimates that just over one in four, or 27%, of trespasser fatalities are suicides.

Earzo, Baumert, & Ladwig (2004) investigated suicide events from the German railway system between 1997 and 2002. Logistic multiple regression results indicated that only a relatively small proportion of suicide attempters survived the event 540 (9.4%). Statistically significant risk factors for fatal suicide attempts were found to be: male gender, night vs. day, open track vs. station area, and main railway line vs. local railway line. Thus, males at night in or around open main line tracks are clearly at higher risk for suicide. Furthermore, only 10% of all railway suicide attempts in their dataset were nonfatal. Or put another way, nearly 90% of attempts result in death.

Mishara (2007) reviewed a number of studies that reported suicide rate data from several European countries and reported that the railway related suicide rate in the Netherlands was 12.4% as compared with England (5%), Germany (7.0%), Sweden (6.2%), Japan (6.3%), Austria (5.7%), Denmark (3.1%), Canada (3%), and Hungary (2.7%).

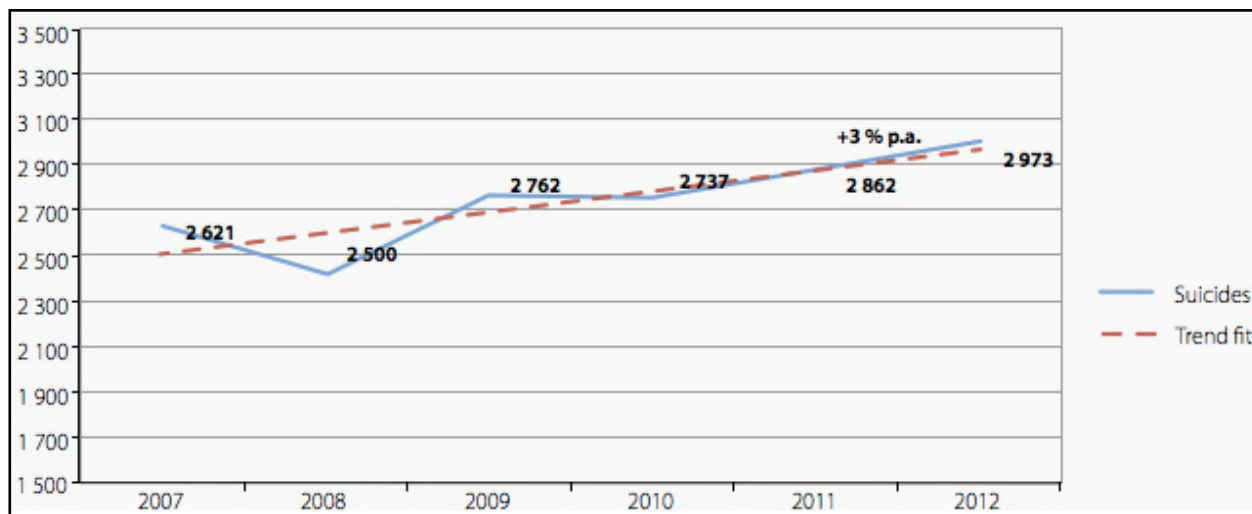


Figure 7. EU Rail Suicides

The annual European Union Rail Safety (ERSR) report was published in the first half of 2014. The report summarizes the suicides on all railways that report to the agency. Suicides represent 70% of all fatalities on railways (Figure 7). There was at least a 25% increase in the suicide rate in six of the EU countries in 2012, including the UK, Sweden, Poland, Portugal, and Lithuania (ERSR, 2014). There have been increases across the EU since 2006. Thus, similar to the worldwide data reported earlier, indicating a steady increase in suicides of all types since 1950, there has been an increase in suicide on the railroads.

Characteristics of the Railroad Locations

Many investigators have attempted to ascertain whether characteristics of the railways themselves have been associated with rail-related suicides. For example, a recent study by Botha, Elmasu, & Leitzell (2010) examined case study statistics in the California system to determine the presence of activity patterns that would yield information leading to the possible prevention of suicides. The report concluded that, while there was a general location (25 miles, or 40 km long) that was more likely to be associated with suicides, there was not any specific location that was more likely than any other to be associated with a particular cause of suicide, such as a school, mental health center, or the like. Taken together, it suggests that population density may have a particularly strong correlation with suicide occurrence. However, recent communications with the AAR suggest that the “high-risk locations” hypothesis has not been laid to rest, and that agencies, particularly on the East Coast, are still attempting to target specific locations for interventions (M. Martino, Personal communication, March 2012).

Another important finding of the Botha et al. (2010) study was that only 20% of suicides occurred at the stations. This is similar to the 26% rate associated with stations from other published literature. Mishara & Bardon (2013) found that over a ten-year period, only 12 (6.5%) of suicides took place in stations, yards, tunnels, or bridges. In fact, they reported that most suicides occurred on open tracks (58.4%) or at a grade crossing (35.1%). Botha et al. (2010) reported that nearly 66% of suicides occurred within one-half mile (0.8 km) of the rail station, suggesting that the terminals are in fact a convenient means for potential victims to identify the railroad tracks. The authors describe the terminal as a convenient point of access for people seeking to die by suicide. Additionally, suicides also occurred in proximity to railroad crossings. Forty-three percent of suicides occurred within one-tenth of a mile (0.16 km) from a crossing, and 66% occurred within 0.3 miles (0.48 km) from a crossing. The authors conclude that most suicides occurred within 0.3 miles (0.48 km) from either the rail station or a rail crossing. Thus, these data provide further impetus for the identification of high-risk target areas around stations within which officials might focus their efforts to reduce suicide attempts.

A study by van Houwelingen, Kerkhof, & Beersma (2010) in the Netherlands investigated a number of key factors thought to have a relationship to suicides on railways. Trends in train suicides were studied over a 57-year period beginning in 1950. Results indicated that train suicides were apparently unrelated to railroad characteristics and that suicide appeared to be unrelated to regional population density. Interestingly, almost 50% of the train suicides took place at a limited number of locations and in many cases close to a village or town and close to a psychiatric hospital. Interestingly, van Houwelingen & Kerkhof (2008) determined that 65% of railway suicides had a history of psychiatric treatment with at least one-half receiving treatment at the time of suicide. Moreover, they also concluded that there is a greater representation of severe mental illness among railway suicides than what is found in the general population. The percentages of affective disorders were found to be similar to that of the general population. Contrary to the Botha et al. (2010) study, van Houwelingen et al. (2010) concluded that further study of suicide prevention at high-risk locations deserved priority.

Preliminary results from another recent study funded by the FRA, the Railroad Research Foundation, and the American Association of Suicidology, (Martino, Doucette, Chase, Gabree, 2013) using the psychological autopsy of 62 rail-related suicides (Appendix 4) revealed that in the USA approximately 77% of suicides in the rail system were in the freight system, and 23% were in the transit system. In addition, of the 62 cases that were autopsied, 84% had exhibited at least three risk factors associated with suicide completion and that a little more than 50% had four or more risk factors, such as: withdrawal, anger, anxiety, and statements of hopelessness. The study also noted that people autopsied had been seen “wandering the tracks or looking up train schedules,” and that 76% lived within 1 mile (1.6 km), and 86% within 2 miles (3.22 km) of the incident. Many also suffered from mental illness and substance abuse disorders. A total of 62% had depression, and 30% had schizophrenia.

A study by Andreisen & Krysinka (2012) examined the frequency of suicide on the Belgian Railways. The country’s suicide rate was 19.1 per 100,000 in 2004. The study concluded that in 2004, railway suicide accounted for 5.3% of all suicides in Belgium. Interestingly, approximately 35% of the cases occurred in 34 “hotspots” from three regions of the country. Hotspots were characterized as having, “(1) easy access to the railway due to a lack of proper fencing, (2) the presence of level crossings within walking distance from the hotspot, and (3) the vicinity of a medical institution.”³⁴ The authorities subsequently initiated a prevention program focused on the suicide hotspots. It should also be noted that the authors found no relationship between suicide rates and characteristics of the railway; rather the suicide rates roughly correspond to the population rates in the various regions. Andreisen & Krysinka (2012) note, importantly, that the railway suicide case fatality rate in Belgium from 2003 to 2009 was 54%, as compared with 94% in Germany (Schmidtke, 1994), 91% in the Netherlands (Van Houwelingen et al., 2010), and 53% for the UK (Symonds, 1985, 1994). In other words, only about one-half the attempts at suicide in Belgium resulted in fatalities. In 2004, the only year for which such comparisons are possible, railway suicide comprised 5.3% of all suicides in Belgium, and similar proportions have been reported in other Western European countries: 5% in Sweden (Rådbo et al., 2005) and 7% in Germany (Baumert et al., 2005).³⁵

An update of the data collected in the UK by Mona Chalabi (2013)³⁶ indicated that rail suicides have remained constant since 2010, with 238 fatalities per year in both 2011 and 2012.

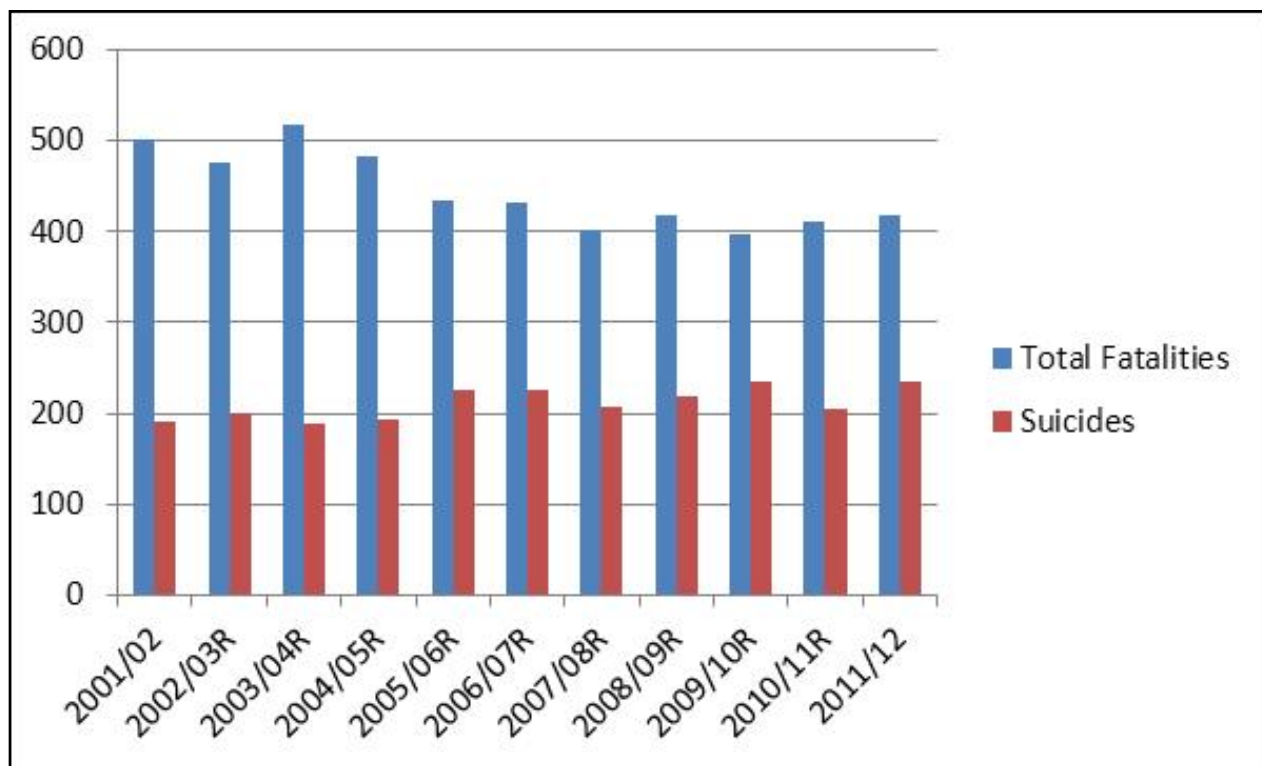


Figure 8. Suicides on UK Railways

Interestingly, the majority of all fatalities on the UK rail system are a result of suicide attempts (Figure 8). By comparison, the UK rail suicide numbers make up about 7.8% of the total number of suicides for the European Union between 2008 and 2011 compared with 30% for Germany and 12% for France. To put this in perspective, however, the population of Germany, France, and the UK (as of the 2006 census) was approximately 81, 62, and 62 million, respectively. An analysis of the European Union suicide data reveals that when corrected for population size, and using the standard rate of suicide per 100,000, that the Czech Republic has the highest suicide rate on average for 2008-2011 at 1.85, and that Germany ranks sixth with a rate of 1.02, France 13th (0.5), and the UK 16th (0.35) (Figure 9). By comparison, the US, with a national suicide rate of 10.1 per 100,000 in 2005, Canada at 10.2, and Germany at 10.3, had only 241 rail-related suicides nationally reported by the FRA in 2011. This is a rate of considerably less than 0.01 per 100,000 population. Germany, France, and the UK had an average of 1.02, 0.5, and 0.34 suicides by rail for 2008-2011.

Another study (van Houwelingen, Baumert, Kerkhof, Beersma, & Ladwig, 2013) found that train suicides in the Netherlands exceeded the German rate by 1.23. When related to train traffic intensity or population density, however, rate ratios turned into 0.74 and 0.59 respectively. The authors concluded that train traffic intensity and population density, plus the number of trains passing, appears to be related to train suicides, which suggests the need for limiting access to the railway tracks.

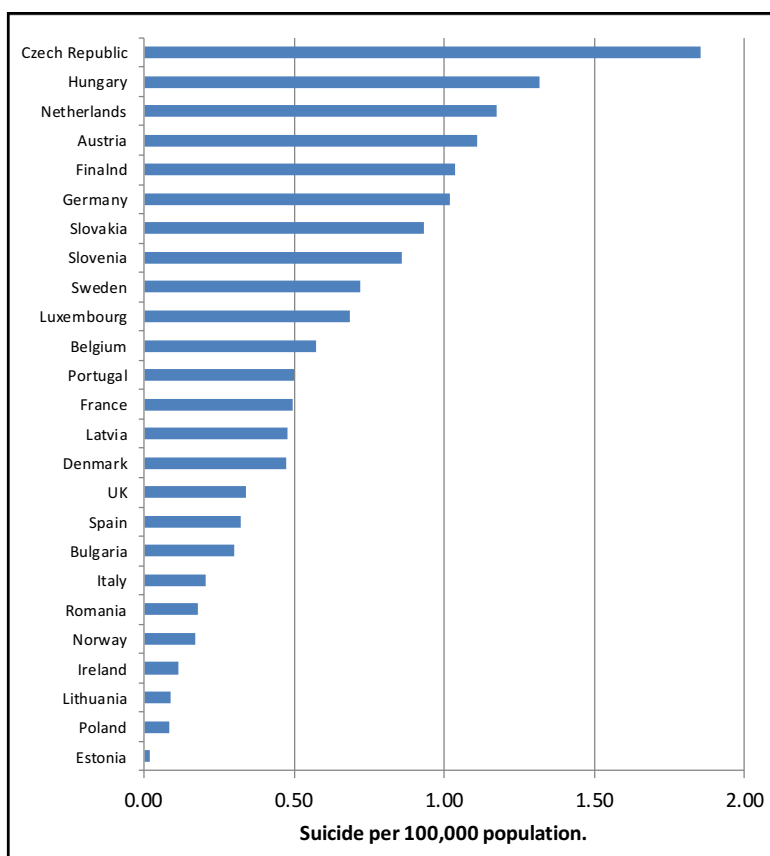


Figure 9. Average Suicide Rate for 2008-2011 in European Union

A study published by Mishara & Bardon (2013) examined a sample of 428 suicides that represented 37.9% of all railway fatalities over the 10-year span of the study. The data show a high degree of annual variability ranging from 30 in 1999 to 60 in 2007. In addition, train-related suicides were fairly rare in Canada, with an average of only about 43 per year. However, there seemed to be an increase over the last three years of record. People who died by suicide using the railways were primarily males, and 43% of suicides involving rail were unemployed and lived either less than one kilometer (0.6 mile) from the tracks (27.8%) or very far from the tracks (24.6%). At least 20% of people who died by train suicide expressed their intent to attempt suicide prior to their death. Moreover, mental health issues were found to be very frequent in railway suicide, although individuals were often not in treatment at the time of their deaths.

In summary, over 50% of suicides in the US involve firearms. This method seems to be fairly lethal. The connection between firearms and railways may be the perception that railways, at least non-transit or non-station instances, involve a high degree of certainty of fatality.

Mental Illness and Substance Abuse

In a more recent study, somewhat related to railway suicides, Britton, Illgen, Rudd, & Connor (2012) examined 381 military veterans' medical charts, comparing those who died within a week (seven days) of healthcare contact (18%) with those who died later

(82%). Using multivariate logistic regression suicidal thoughts, psychiatric symptoms, and somatic symptoms, after controlling for demographic variables, predicted suicide within a month or a week OR (95% CI)=3.46 (1.15–10.38), and psychotic symptoms, OR (95% CI)=2.67 (1.11–6.42). These results suggest that some further screening of individuals regarding their intended method of completion may lead to more accurate predictions of suicide. It is a fairly routine practice in the emergency room (ER) and psychiatric setting to inquire whether a person has access to firearms or drugs as a means of suicide. However, it may be necessary to ask about use of railways as a method for suicide for people who live near the tracks, are unemployed, don't have a car, or live near a mental hospital. However, the practical application of these findings in a non-clinical setting (i.e., railroad yard or platform) is very challenging.

The Federal Railroad Administration (FRA) released a report in May 2013 that examined fatalities on the railways, including suicides, at the national level (Appendix 4). Investigators sent a survey to the 564 coroners/medical examiners who had jurisdiction over each of the 2749 fatality reports of trespasser fatalities in the FRA database between 2005 and 2008. A response rate of 54% (1,429 of the 2,662 fatality reports) was obtained, and of that, useable data from 1300 cases were available for analysis. Results show that 27.7% of the railroad-trespasser fatalities were the result of suicide (Figure 10), with an additional 12% being undetermined. The majority of those completing suicide were male (over 87%), with men between the “ages of 20-29 relatively more likely to die by suicide than are the other age demographics.”³⁷ Alcohol was involved in only 28% of confirmed suicides, compared with 50% of non-suicide fatalities, while 19% of both suicides and non-suicides involved drugs. This finding is similar to the Mishara & Bardon (2013) study in Canada that found a high incidence of mental health issues in railway suicides.

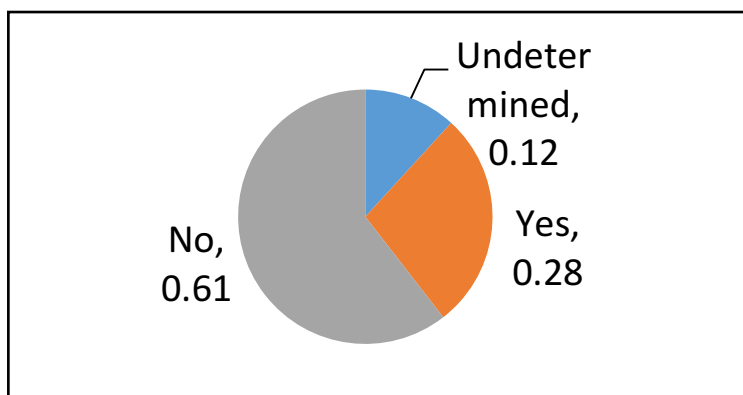


Figure 10. Suicide by Railroad Trespassers

Age and Gender

Results of the FRA study indicate that suicide occurs most frequently in the 20-29 year age group. About one-third of all railroad suicides are by people under 30 years of age. In the Netherlands, van Houwelingen et al. (2010) found that most suicides also occurred in the 20-29 age group for males and 30-39 for females. Sousa et al. (2015) found that the 40-49 year old group had the most suicides for males (33.3%), with females age 50-59 having the most (30.8%).

Summary

This section reviewed the occurrence, causes, and risk factors of suicide in general and on railways. This review clearly identifies males between the ages of 20-29 as being more likely to die of suicide on the railways. However, males between 20-55 are also at great risk. People suffering from depression or some other mood disorder are at a greater risk for suicide. And many people who attempt or complete suicide have an involvement with alcohol or drugs.

Access to the right-of-way was found to be a factor. Some studies show a decrease in the occurrence of suicide when steps are taken to reduce access. There are also mixed results regarding the presence of “hotspots,” with some studies identifying them and others failing to do so. This may be a result of statistical variability due to sample size and naturally occurring fluctuations in the randomness of suicidal activity. Some of the data regarding mechanism of choice for suicide suggests that limiting access to firearms clearly reduces the occurrence of suicide in the general population. Similarly then, reducing access to the right-of-way makes sense. However, the data also suggest a likely subset of individuals who are poor, who do not have a firearm, and who are sufficiently distressed to seek intentional harm on themselves that they will seek the railway as a variable method of suicide. In other words, they are probably different from the people who impulsively use firearms. Given that it takes some effort to find, identify, and wait for a train, those people seeking to harm themselves through the use of trains are probably different from those who choose self-harm using firearms. Nevertheless, there do appear to be correlations between train density and population density that warrant close monitoring.

Lastly, the literature review suggests a strong correlation between economic conditions, such as unemployment and layoffs, and suicide. One recent study showed the relationship between length of unemployment and suicide over time. The correlations between suicide and economic recession and mass layoffs clearly point to the fact that these economic and social events cause great upheaval in the population, and that those who are most vulnerable—again those who likely don’t have a firearm or access to one—will over time see the railway as a viable method of suicide. In addition, there is evidence showing the relationship between social disintegration in various communities associated with higher rates of suicide. Thus, in those areas where railways pass through distressed neighborhoods and communities, opportunities may be present for intervention and prevention.

Suicide Prevention on Railways

A recent review of the literature revealed that there is limited evidence to support the efficacy of suicide prevention programs. To remedy this problem, a multi-national study in Europe has been commissioned to try to increase the efficacy of these programs (Hegerl et al. 2009). The US Air Force (USAF) conducted a large-scale community-based intervention program focusing on training community personnel to recognize early warning signs in potential victims. It resulted in a 33% reduction in suicide rates. However, critics argued that the general suicide rate was declining at the same time, thereby artificially reducing the rates (Knox, et al., 2003). Subsequent follow-up studies of the USAF program have shown that the rate of suicide decreased to 2.387 per 100,000 during the intervention

period (1998-2009) from 3.033 per 100,000 in preceding years, a statistically significant difference (Knox et al. 2010).

Signage

Interest in signs that communicate with potential suicide victims was sparked by a study by King & Frost (2005). It was well known to local authorities that a series of parking lots near high cliffs in rural UK had been identified as particularly attractive for suicides. Results of the study showed that using signs displaying the phone number of a national crisis intervention help-line prominently displayed in the parking lot significantly reduced the number of suicides from 10 per year to less than 3.3 per year during the three-year study period. The use of signage has been adopted in the London subway system and other locations throughout the world. However, no other reports of the effectiveness of this approach have been reported.

A recent report by Bartholomew (2011) indicated that the railroad suicide rate on Caltrain was 11 deaths in 2010 and 15 in 2009. To reduce the number of suicides, Caltrain has begun a pilot project to print 250 warning signs that include a phone number to a local crisis center hotline. However, only a very small percentage of individuals who completed suicide were found to carry a cell phone, raising questions about the best way to send or receive information. Perhaps toll-free numbers posted on pay phones placed close to the tracks would be more effective.

The Toronto Transit Commission (TTC) has initiated an award-winning suicide prevention program called "Crisis Link" that uses posters on every subway platform that ask, "Thinking of Suicide? There is help. Let's talk." (TTC, September 2011) The posters encourage people considering suicide to use the public phone on every subway platform and the new "direct dial button" that now connects callers with a trained counselor at the Distress Centers of Toronto. Counselors talk with the caller, assess suicide risk, and work with the TTC's Transit Control Centre to implement the appropriate measures to ensure the individual remains safe. Digital copies of the posters are available to other agencies. Recent publications suggest that the suicide rate has declined almost 46% since the beginning of the Crisis Link program (TTC, September 2011). The number of deaths by suicide was 18 in 2009, 26 in 2010, and 7 for the first half of 2011. Data has not been released for the second half of 2011.

The Canadian Web Site³⁸ by the Center for Research and Intervention on Suicide and Euthanasia (CRISE) at the University du Québec à Montréal (UQAM) has briefly summarized some of the materials that have been used to provide access and help to people on or near the railways. Based on the assumption that most people contemplating suicide are ambivalent, the railways have developed signs and posters that encourage people on or near the railway to seek help or assistance regarding potentially life-threatening situations, including suicide. Railways have begun to provide signs and public telephones to encourage people to use these services. According to the web site, a system of signs and telephones has been implemented in the Toronto Metro in 2010. Evaluation has shown that those who used the available phone on a New York bridge did not attempt suicide from this location, and suicides on that bridge declined dramatically.

Training

In a study by Lukasczek, Baumert, & Ladwig (2011), a questionnaire was administered to 202 German police officers using the Internet. Findings revealed that police officers had observed that over one-half of the people who attempted suicide dropped or left personal belongings, avoided eye contact, and exhibited erratic gestures. Problems in communication and general confusion were also observed to a lesser degree. About one-third of all suicide victims died in rail stations. The authors concluded that railway suicides are likely preceded by definite patterns of behavior. Thus, prevention efforts may wish to focus on training first responders to identify and respond to people displaying these signs.

Bean & Baber (2011) described a community-wide suicide prevention program (CONNECT) based on an ecological model designed to identify individuals at risk for suicide. This approach is thought to modify the social environment by “developing shared knowledge, language, and understanding among all constituencies in a community.” (p. 89) The authors hypothesized that suicide prevention is “best accomplished by training individuals in all of the microsystems” (p. 89), and that the individuals at risk will function in the system and connect the at-risk individuals to services within the system. Trained individuals are then expected to refer the at-risk individuals to the appropriate services and assistance. Results from evaluations of their community awareness program revealed a significant increase in correct knowledge about youth suicide from pre- to post-training, as well as significant changes in attitudes toward providing help and seeking assistance.

A partial example of this approach in the transit setting can be seen in the TTC. Toronto Transit has implemented a program called “Gatekeeper” that provides training to front-line operating employees so they may be aware of the signs of suicide risk in patrons and passengers (TTC, 2011). Moreover, the program trains participants to intervene appropriately with potential suicide attempters. Incidentally, the TTC also does extensive work with its own employees who have been exposed to suicide in the subway system. In addition, training programs with local members of the operating staffs help identify people exhibiting the signs associated with suicide. In short, the premise of the current study, similar to that of the TTC, is that several hours of training supplied to key operating personnel will have a very positive effect on identifying and intervening with potential suicide completers. If effective, the suicide rate in locations in which the training was provided would most likely decline.

Barriers

Based on the assumption that suicidal individuals have a plan, but that obstacles can disrupt plans, railway planners have installed barriers in various locations. Plexiglas walls, along with other fences and barriers, have been used to prevent access to the tracks. For example, in Hamburg, Germany (Figure 11) fences have been installed on open platforms to discourage access to tracks.



Figure 11. Barriers at Hamburg, Germany Platforms

The use of platform doors or barriers that prevent access to tracks until the doors open has been adopted in several cities around the world. For example, in Hong Kong (Figure 12), as reported by Law et al. (2009), barriers limited passenger access to the tracks. After the installation of platform screen doors, the suicide rate was reduced by 59.9% with no evidence of substitute locations being developed. Later, Law & Yip (2011) reported that installation of platform screen doors reduced the number of suicides by 68.8%, with no apparent substitution of alternate railway sites. In addition, economic analysis showed that screen door installation was cost effective.



Figure 12. Plexiglas Walls in Hong Kong Subway

In May 2010, the TTC approved a plan to build subway suicide barriers at a cost of \$690 million. In 2009, 19 people died by suicide by jumping in front of subway trains, causing delays totaling 23 hours. While exact figures are unavailable, the average cost of a delay is at least \$10,000 in the USA.³⁹

Recent construction in Japan and Hong Kong has included platforms with suicide prevention five-foot walls running the entire length of the platform, and with doors that open only when the train has stopped. “Jumping in front of a moving train is one of the most common suicide methods in Japan,” according to Winer (2012).⁴⁰ (<http://www.martincwiner.com/ttc-suicide-prevention-barriers/>) In addition, the CRISE group has stated that, “Barriers have been mostly installed in urban transportation systems, such as subways and commuter trains in a number of cities, including Bangkok, Barcelona, Beijing, Copenhagen, Dubai, Guangzhou, Hong Kong, Kuala Lumpur, Lille, London, Paris, Rome, Saint-Petersburg,

Seoul, Singapore, Taipei, Torino and Toulouse.”⁴¹ Based on a review of 14 studies, nine of which examined the effectiveness of physical barriers, Cox, Owens, Robinson, Lockley, Williamson, Cheung, & Pirkis (2013) determined that suicides are reduced, with no discernable increases elsewhere.

Discussions with key individuals involved in the recent, but unpublished, FRA/Railroad Research/AAS study indicated that targeted barriers will be one of the key recommendations coming out of their work (M. Martino, AAR, Personal Communication, 2012). Because of the system’s size, it is not considered practically or economically feasible in many commuter operations in the USA to fence in the entire system. Accordingly, the recent FRA/RRR/AAS study recommendations are expected to suggest that identification of “hot spots” be initiated and that the strategic use of barriers and other counter-measures be implemented (Sundaraman, 2008).

Limiting Media

Stack (2003) examined 42 studies on the impact of suicides reported in the media. Results of their meta-analysis showed a statistically significant effect such that a copycat effect was 14 times more likely to be found if the person who died by suicide was a celebrity or an entertainer. Surprisingly, the copycat effect was 82% less likely to occur for media reports using television than for newspapers. Efforts to change media reporting policies were strongly encouraged.

Ladwig, Kunrath, Lukaschek, & Baumert (2012) investigated the “copy-cat” effect of publicized suicide on subsequent fatality rates in Germany following the death of Robert Enke, an internationally respected German soccer player. Mr. Enke, apparently distraught over the death of his daughter, attended practice and then drove his car to the nearest railway crossing. Shortly after, he apparently threw himself in front of an oncoming train.⁴² Results of the analysis of suicide incidents compared with the preceding three years showed that suicides by railway increased by a rate of 1.81 over preceding years, which is equivalent to an overall increase of 81% over the three previous years. This was highly statistically significant. When the number of suicides 28 days before and after the incident were measured, the incident rate increased to 2.2 times that of the previous year’s data. The authors concluded that the substantial increase in suicides following the death of the soccer player was due to the copycat effect.

Kunrath, Baumert & Ladwig (2011) also investigated the effects of media reporting of Mr. Enke’s intentional death. Their analyses also revealed an increase in suicides following publicity by news media. The investigators examined the national database and compared the suicide rates for two distinct time periods. A control period before and after published reports was examined. Results indicate that the average number of railway suicides per day in the index period increased significantly to 2.66 (95% CI 2.19 to 3.13) compared with 1.94 (95% CI 1.78 to 2.10) during the control periods. The investigators concluded that there could be as high as a 44% increase in suicides following published news reports. A similar study by Hegerl, Koburger, Rummel-Kluge, Gravert, Walden, & Mergl (2013) also found that the number of rail-related suicides in the two years before and after the published reports of his death increased by 18.8%, and that the total number of suicides was significantly different from the years previous.

More recently, studies by JeSuk, Lee, Hwang, & Stack (2014), Lee, Lee, Hwang, & Stack (2014),⁴³ and also Suh, Chang, & Kim (2015) examined the effects of celebrity suicides in Korea. A large number of media reports followed these tragic events between 1991 and 2010. After controlling for the baseline number of suicides, a significant increase in the number of suicides following each celebrity suicide was observed. There was a statistically significant increase in the number of suicides following the celebrity suicides, as well as a correlation between the number of media reports and number of suicides. Some media reports included details of the suicide methods and other information that has been considered a risk to potential readers of such reports.⁴⁴ While not specifically related to railway suicide, these results strongly suggest the presence of a significant copycat effect due to media reports. Interestingly, the authors also noted fewer suicides following the adoption of “responsible reporting practices” in Austria.⁴⁵

Too et al. (2014) reviewed studies that had been published looking at the effects of media reports on suicide occurrence. Too et al. (2014) argued that suicidal behaviors had increased in the month following the report of completed suicides.

Investigators and others have called for limiting publicity following a suicide. This is a complex task involving coordination of communication efforts at many levels. Despite the evidence that publicity may increase the copycat effect, such a project would likely be multiyear and complex, involving many layers of management and administration, as well as a number of different agencies. Thus, for the present time, it is beyond the scope of this project.

Summary of Literature Review

Findings from various research studies suggest that several areas of intervention relative to preventing railway suicide may be promising, namely:

1. Barriers
2. Signage
3. Media reporting
4. Identifying people with psychiatric difficulties
5. Training key personnel for early identification and intervention

Installing limited barriers at identified “hot spots” would likely reduce suicides and could perhaps limit substitutions. Installing signs with hopeful and helpful messages would also be an effective technique that could be implemented within the scope of the resources of this study. Finally, training frontline personnel to identify and intervene with people exhibiting the risk factors associated with severe psychiatric disturbance (e.g., alcoholism, psychosis, or severe depression) could also be implemented and its effects monitored.

Suicide Prevention on Various US Railroads

Southern California – Metrolink

Metrolink is a large commuter railroad in southern California. Safety statistics compiled by the staff are reported annually. As can be seen in Figure 13 the number of suicides has increased from 2 in 2007 to 19 in 2012. The rate for 2013 and 2014 is lower, and 2015 is not yet complete. The suicide data is brought into relief by comparing it to the total number of incidents reported on Metrolink over the past few years, which appears to be fairly stable. Incidents refer to any event involving a train and a trespasser, whether or not it results in an injury.

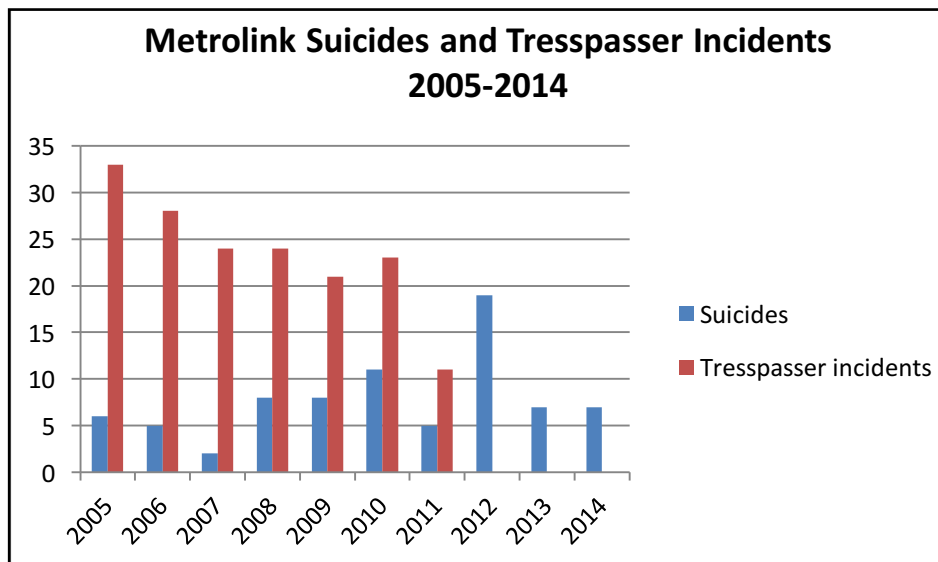


Figure 13. Metrolink Incidents over the Last Seven Years

Metrolink has noted a decline in suicides for 2013 and 2014 since the large number in 2012 (Figure 13). Metrolink participated in the employee training efforts designed to increase awareness of suicide and its risk factors, signs, and symptoms. In addition, the participants in the training program were front line personnel charged with identifying people on platforms and in stations who might need assistance.

Los Angeles – Metro Rail

LA Metro Rail serves the immediate urban community. The Metro Blue Line (Table 1) is one of the nation’s busiest light rail lines carrying nearly 30 million passengers a year. It spans 22 miles (35.4 km) with 22 stations from downtown Long Beach to downtown Los Angeles, crisscrossing cities such as Los Angeles, Vernon, Compton, Carson and Long Beach and several unincorporated zones of Los Angeles County.⁴⁶ On the education front, Metro has deployed “safety ambassadors” – retired bus and rail operators – assigned to spots where accidents have occurred in the past. On the Blue Line 14, ambassadors are stationed at seven key locations in two shifts, Monday through Friday, from 6 a.m. to 6 p.m. They answer questions and warn people about the danger of trying to beat an oncoming

train. Also, Metro began a partnership with the Didi Hirsch Suicide Prevention Center to help prevent suicides. Signs with the suicide crisis line (877-727-4747) have been posted in the stations and the alignment.⁴⁷

Table 1. LA Metro Rail Fatalities and Suicides Demographics

LA - Blue Line	Male		Female	
	Fatalities	Suicides	Fatalities	Suicides
Ethnicity				
Caucasian	11%	26%	5%	5%
African American	25%	21%	9%	5%
Hispanic	38%	37%	11%	5%
Age				
10 to 20	5%	0%	4%	0%
21 to 35	24%	16%	4%	5%
36 to 50	24%	32%	9%	11%
50 +	22%	37%	9%	0%
Time of Day				
4am to 12pm	15%	11%	5%	0%
12N to 4pm	20%	16%	11%	5%
4pm to 8pm	25%	26%	5%	0%
8pm to 4am	15%	32%	4%	11%

During 2013, seven people died by suicide on the Blue Line, a 22-mile (35.4 km) route between downtown Los Angeles and Long Beach (Table 2). Previously, suicides had averaged one per year since the line opened in 1990, according to Metro spokesman Marc Littman.⁴⁸

In an effort to reduce the number of suicides LA Metro rail appealed to the public “We’ve reached the point where we must appeal to and engage the public” Metro spokesman Marc Littman said.⁴⁹ Metro already has taken steps to decrease suicides, including sending retired bus and train operators to Blue Line stations. Littman said these “safety ambassadors” have stopped three people from killing themselves since December.⁵⁰

Table 2. LA Metro Rail Accidents Fatalities and Suicides⁵¹

Year	Blue Line			Total		
	Accidents	Fatalities	Suicides	Accidents	Fatalities	Suicides
2012	35	9	4	47	10	4
2013	22	4	2	31	5	2
2014	--	--	--	--	--	--

These statistics must be closely monitored due to the exceptional prevention efforts that LA metro rail has initiated. The engagement of the community and the use of safety ambassadors are exceptional and should yield good results. Also, the LA Metro Rail team has placed over 130 signs at key locations on the property, advising people of the suicide hotline phone number.

New Jersey – New Jersey Transit

Figure 14 shows trespasser fatalities on commuter lines since 1990. Note: NJ Transit has tracked Amtrak fatalities only since 2008. From 1990 to 2007, Amtrak fatalities listed in this chart should be considered a bare minimum because suicides were not always reported to the Federal Railroad Administration.

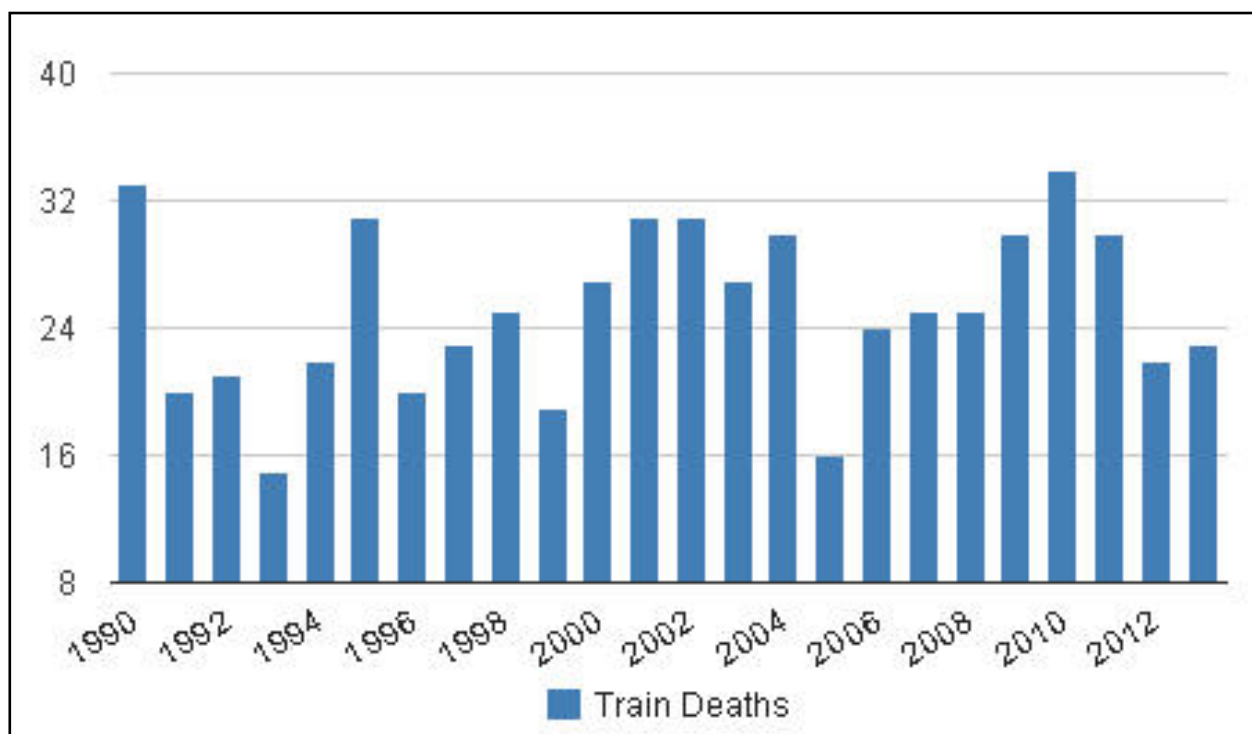


Figure 14. FRA Suicide Statistics

Sources: NJ Transit, Federal Railroad Administration.

Based on data provided by NJT officials, the following statistics were compiled. As seen in Figure 14, the FRA and NJT have tracked suicide statistics since 2000. However, these numbers are considered conservative because not all fatalities can be confirmed as suicides. Figure 15 shows that there are also a high number of unconfirmed and possible suicides.

Similar to national statistics compiled by the WHO, the rate of suicide on the NJT is much higher among men than women—43% to 8%, respectively.

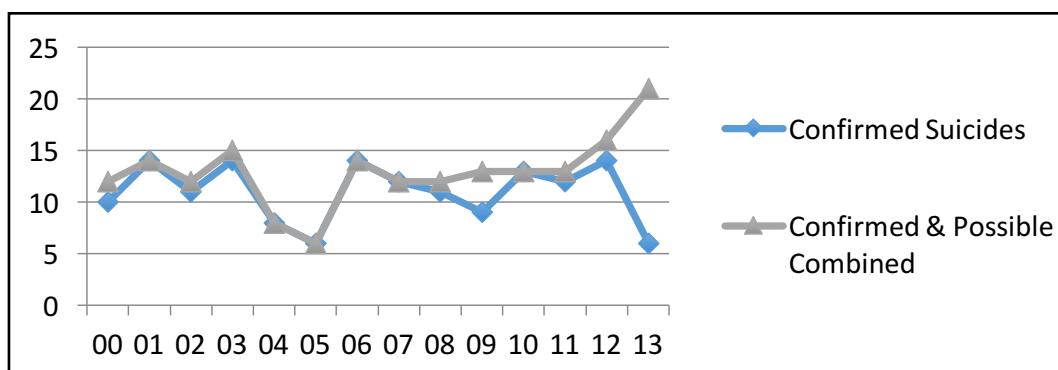


Figure 15. NJT Suicide Statistics 2000-2013⁵²

In an attempt to counter suicidal behavior, according to spokesman William Smith,⁵³ NJT has posted signs, similar to the one in Figure 16, at the Rutherford Train Station displaying the suicide hotline number at all of its 164 rail stations. In addition, NJT is working with local and state suicide prevention agencies to promote suicide awareness.⁵⁴



Figure 16. New Jersey Transit Signage

NJT and the state DOT have also implemented additional safety improvements in an effort to prevent suicides. For example, in the city of Garfield, NJ, where there have been more train fatalities than any other community in New Jersey, workers have added fencing and an electronic sign that gives an audible warning when a second train is coming. In Matawan, so-called “skirts” have been installed below crossing gates, which prevent pedestrians from subverting the purpose of the gates by ducking under them. Maintenance-of-way crews routinely trim trees and clear brush to give engineers a better view of potential trespassers. Lastly, in locations where several people died by suicide by stepping in front of Amtrak Acela trains, police now monitor a camera that watches over the tracks. Police also monitor if someone shows signs of despondency or wanders too close to the tracks, and they send a car to investigate.

New York City – MTA

Recently, a study by Gershon et al. (2000) reviewed the epidemiology of subway fatalities in the New York City subway system. Reviewing the data from the medical examiner from 1990 to 2003, the authors identified 668 subway fatalities. The authors determined that 10 (1.5%) were homicides, 343 (51.3%) were suicides, and 315 (47.2%) were accidental.⁵⁵ Following a further analysis of the suicides, the authors concluded that structural, enforcement, and social prevention techniques were likely to be most effective. In particular, the authors suggested that a public relations campaign similar to that used for drunk driving might be helpful in raising awareness and reducing the occurrence of accidental and intentional injury and deaths.

Table 3. MTA Fatalities and Suicides for 2008-2013

	2008	2009	2010	2011	2012	2013
Fatalities	59	82	76	73	84	---
Accidental	59	82	27	29	48	25
Suicide			49	44	36	40
NYC Subway	34	49	51	47	55	34
LIRR	15	23	20	22	23	24
MNR	10	9	5	4	6	7

New York City is served by three commuter rail lines: the New York City Subway, Metro North, and Long Island Railroad. According to a report provided by New York City's Department of Health and Mental Hygiene, the NYC suicide rate is about one-half the national average (NYC=6, and USA=11 per 100,000).⁵⁶ Additionally, looking at the total number of suicides in New York City, only about 7% involve subways (Table 3) as the method of intentional harm.⁵⁷

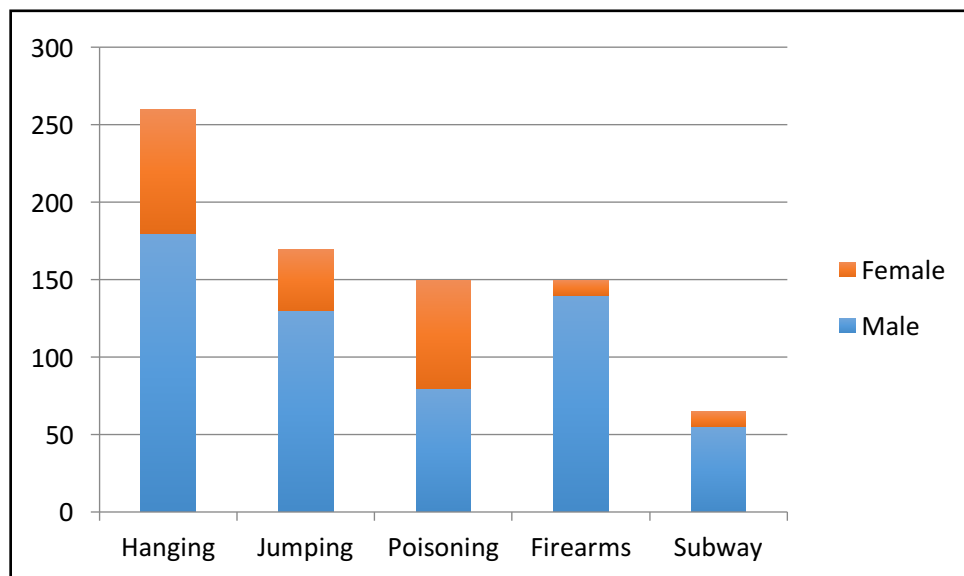


Figure 17. NYC MTA Suicide by Method

From 2010 to 2012, there were a total of 153 deaths by subway trains, and 78 were believed to be suicides. In 2010, 35 out of 51 total fatalities or 69% of all subway deaths were suicides (Table 4). In addition, over the three-year period, a total of 118 suicide attempts were made with a 66% completion rate, according to the MTA data.⁵⁸ Moreover, in NYC the data show that the most frequently used method of suicide is by hanging, followed by jumping, poisoning, firearms, and then subways. (Figure 17)

Table 4. MTA Fatality Statistics 2010-2013

	2010	2011	2012	2013
Total Deaths	51	47	55	28
Suicides	35	24	19	16
Accidents	16	23	36	12
Assaults	0	0	2	0

Long Island – Long Island Railroad (LIRR)

According to information provided by LIRR officials, there were five suicides 2011 on the LIRR system through May. There were 15 in 2010, 7 in 2008, and 16 in 2007. The LIRR has a very aggressive and comprehensive approach to suicide prevention involving signage, identification of hot spots, and policing stations and platforms. The LIRR began putting up posters at its 124 stations in 2009 that include the number of a free suicide hotline set up by the agency (877-582-5586). The poster features the image of a set of train tracks and the message, “Suicide is not the route.”⁵⁹

Calls to the hotline are answered by either of two suicide prevention agencies staffed 24 hours a day: The Long Island Crisis Center, based in Bellmore, and Response of Suffolk County, based in Stony Brook.⁶⁰

Washington DC – WMATA

The Washington Metro Area Transit Authority (WMATA), which operates the rail line, began a suicide prevention program in 2012. The program consisted of communication and signage directed at people who might be considering harming themselves using the train lines. The signs read, “You talk. We listen. Together we survive.” The signs also provide a number to a suicide prevention hotline. That toll-free number is 1-855-320-LIFE (5433). It also consisted of additional efforts to alert both employees and the public to the dangers of coming into contact with moving trains. The transit agency began training station managers and other front-line workers about how to spot and intervene with suicidal riders. According to the Washington, DC, Department of Mental Health, some station managers were given preprogrammed cell phones to contact clinicians if they need help, and 344 workers have been trained.⁶¹ One statistic reported by WMATA revealed that only 68% of suicide attempts by train die.⁶² In addition, minutes from the regular monthly board meeting provide the statistics for the past several years, indicating that the overall number of deaths has fluctuated but overall has declined since 2006 (Figure 18).

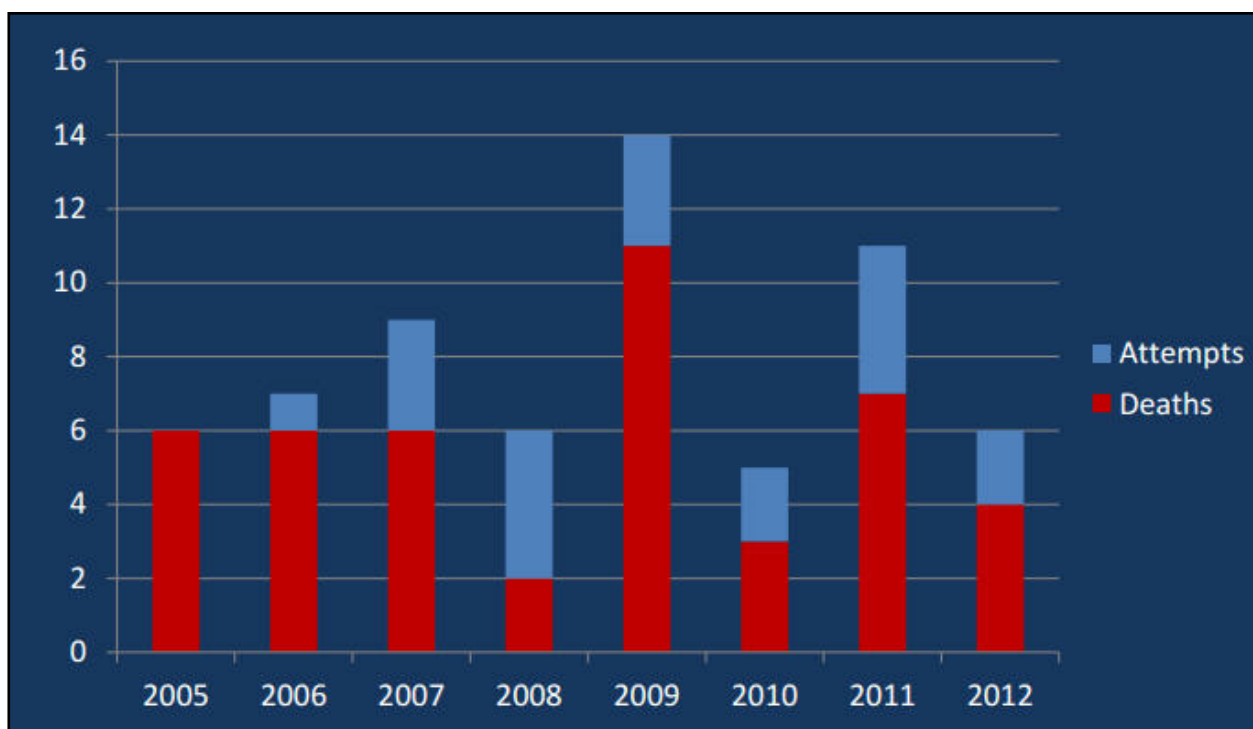


Figure 18. WMATA Suicide Statistics (Board Meeting 2012)⁶³

Boston – MBTA

The Federal Railroad Administration has funded an effort to monitor train suicides as part of a study that examines how more suicides could be prevented. The study looks more closely at fences and other barriers, which are often low and unstable if they exist at all, along the nation's rail beds. There are 300 to 500 train suicides a year, according to the study's preliminary findings.

In Massachusetts, 15 people were killed on the tracks in 2008, the most recent year for which federal data are available, although the data do not indicate how many of those were suicides.

MBTA and the Massachusetts Bay Commuter railroad created a partnership with the Samaritans organization, a non-profit group offering counseling, 24-hour suicide hotline, public awareness signage, training, and other mental health services. Together the three agencies initiated an outreach program to raise awareness of suicide prevention efforts.⁶⁴ The Samaritans also provide counseling services and training for new rail engineers.⁶⁵

Philadelphia – SEPTA

In 2013, an article in the *Philadelphia Inquirer* reported that SEPTA rail deaths had increased from six in the first quarter of 2012 to eight in 2013. Fatalities have risen from 10 (two suicides) in 2010, to 14 (six suicides) in 2011, to 15 (two suicides) in 2012.⁶⁶ There were five suicides in 2010, four in 2009, one in 2008, and two in 2007, according to the Philadelphia Medical Examiner's Office⁶⁷ (Figure 19).

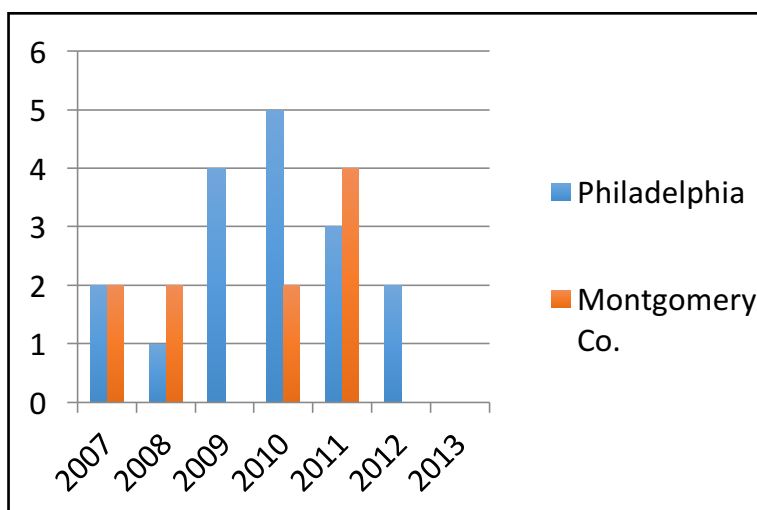


Figure 19. SEPTA Suicide Statistics

Despite the media attention to the issue and suicide-prevention networks, railroad employees are unsure what can be done to prevent people from diving in front of trains.

“To try to prevent someone from hurting themselves, when our system is intended to be accessible to everyone, is a difficult process,” said Scott Sauer, manager of operational safety at SEPTA. “We try to protect people from themselves.”⁶⁸ The transit agency has considered posting phone numbers to local help lines near their tracks, but Sauer said that there is no proof that this is an effective means of prevention elsewhere.

Chicago – Metra

Chicago Metra has not initiated any programs designed to reduce the number of suicides on the rails. Hilary Konczal, Metra’s director of safety, was quoted in the *Chicago Tribune*. “There are several things we can do, and we’re looking to see if one of those would be beneficial or not,” Konczal said. “The last thing we want to do is implement a program that isn’t working.”⁶⁹

Recently, a study of the 338 rail-related fatalities in metropolitan Chicago between 2004 and 2012 was released by Savage (2014).⁷⁰ Almost one-half (47%) of the pedestrian fatalities were apparent suicides. Similar to findings reported by others, the majority of suicides were completed by males (72%) between the ages of 18 and 65 (83%). No relationships were found between suicides and days of the week, time of year, or location. However, there was a significant correlation with peak commuter travel times. Additional analyses also identified “hotspots” with a higher number of suicides and also a correlation between frequency of fatalities and density of public access to the tracks but not train volume. But, the actual distribution of the occurrence of the suicides was only weakly related to density of public access. A significant relationship was also found between apparent suicides, higher train frequency, and a greater proportion of passenger trains that run to a published schedule. Finally, the majority of the suicides in this data set were not correlated with any copycat activities, with the exception of a dramatic increase (95%) in suicides following the highly publicized rail suicide of a railroad official in 2010.

Summary of Railroad Prevention Efforts

Suicide using railroads as the mechanism is a constant threat in the US commuter rail system. Statistics vary, and rates may have increased slightly in some areas of the country. However, there is no doubt that many consider suicide by rail a serious problem. Unfortunately, there are very few proven techniques for reducing suicides. Even barriers may only divert the problem. Nevertheless, the majority of commuter railroads have implemented some type of program to alert potentially suicidal people, who might trespass onto the right-of-way about the availability of suicide prevention programs and professional help. About one-half of the commuter railroads studied have made efforts to post signs with suicide hotline numbers attached at key locations on their property that are visible to passengers. In addition, several railroads have also engaged in training programs for their employees to alert them to the warning signs and preventive steps that can be taken if passengers or trespassers are identified who might be suicidal. While the data are not as clear on US commuter railroads studied with respect to the role of economic conditions and suicide frequency, there is little doubt of this relationship globally. Additionally, while a few railroads have identified “hotspots,” others have not, and repeated efforts by investigators to identify hotspots have not been forthcoming in the USA. Both of these issues could be due to the small numbers of events being studied in urban settings, which might mask the more robust findings from national data sets. It is hoped that the new reporting requirements instituted by the FRA will provide better data for analysis over the next few years.

PROJECT 2: EFFECTS OF SUICIDE AWARENESS PROGRAM

Objective

The researchers participated in designing and implementing a training program administered to employees of a large urban commuter railroad. An instrument was administered to participants of the program and then after the program. In addition, several comparison groups were identified.

Introduction

As seen in the background provided in the literature review, many of the railroads have implemented a staff-oriented, suicide-prevention training program. However, little is known about the effectiveness of this approach either in terms of its impact on the employees or its impact on the number of suicides that occur. While it was not possible to gather the longitudinal data necessary to determine the impact on potential suicides, the author can evaluate the impact of the program on the participants. Thus, the objective of Project Two was to evaluate the effectiveness of a training program developed for people in two commuter railroads.

Methodology

In order to conduct this study, several collaborative relationships were formed with various agencies around the country. The primary collaborators were the LA Metrolink, LA Metro Rail, and Denver RTD. These agencies agreed to participate in various efforts to design

training programs, assessment instruments, and community awareness efforts. Participants in the study included people identified as likely first-line employees who would have some face-to-face contact with the riding public at various locations throughout the system.

Suicide attempts and fatality data from the transit agencies for the study period were gathered. However, there was insufficient funding to permit funding to gather and analyze longitudinal data.

Suicide Awareness & Prevention Training

The suicide prevention and training program was developed in conjunction with the agency management teams of the agency research partners. The teams worked with the authors to develop a program that increased the awareness of the participants' knowledge of suicide and its risk factors and its identifying characteristics. It was also made clear that the program should not include or even recommend that people be expected to perform as mental health professionals unless otherwise directed by their supervisors. It was also hoped that they should not be expected or be required to act as suicide prevention frontline personnel. Such a role was to be reserved for the police and mental health professionals. In addition, it was determined that a person could learn what their role was and, through the training, learn to approach and ask questions of people who could potentially intend to harm themselves. An important goal of training was for the participants to be able to clarify their own role—that is to be as clear as possible as to what their expected duties were on their job so they could be certain of how they should behave and what the appropriate expectations were for their activity. Lastly, the program was expected to increase their confidence and sense of self-efficacy regarding their ability to be of assistance in preventing and responding to people who might want to intentionally harm themselves on or near the railroad. Thus, the program included the following components:

- Increase Awareness
- Reduce Stigma
- Engage Community
- Improve Identification/Surveillance
- Enhance Employees' Self-efficacy
- Prevent Premature Deaths/Suicides

The content of this training program can be delivered in a few hours by a trained mental health counselor in conjunction with appropriate managerial staff from the railroad. Generally, the format is group presentations followed by questions and answers, and group discussion.

Measures – Evaluation of Training

Regarding the employee interventions with potential suicide attempters, and drawing upon Baber & Bean (2009), a questionnaire was designed to assess the changes in knowledge, attitudes, and beliefs related to identifying and intervening with at-risk individuals. The Evaluation of Suicide Prevention Training Assessment (ESPTA) was developed with the intention of administering it to a representative sample of key personnel likely to observe potential suicidal behaviors in the key target areas.

After reviewing the literature and other information, a series of questions was developed that were thought to be acceptable to the agencies. The survey instrument consisted of three main categories of items, which served as the evaluation variables, including:

- Knowledge
- Attitudes
- Self-efficacy

Items were generated in each of these categories. After the items were generated, they were presented to the key officials at the locations. Several of the items were deselected by the managers and staff due to the sensitive nature of the topic, the desire to not offend any staff or personnel, and the desire to keep the instrument to a manageable length. Once the survey items were agreed upon, they were administered to a group of students studying for their Masters in Counseling for normative and comparison purposes. The final survey is included in Appendix 1.

The ESPTA measure consisted of three scales, which were evaluated to determine their reliability. The scales meet acceptable reliability with the Self-Efficacy Scale being equal to .88, the Knowledge scale being $\alpha = .71$, and the Attitudes Scale being equal to .76.

Procedure – Evaluation of Training

The Suicide Prevention Training Program was delivered twice at two different locations to members of one of the large metropolitan commuter railroads. The training lasted approximately four hours and followed the outline given in Appendix 3. A staff member from a local mental health agency facilitated the training. Some materials utilized in the training were provided by the Centers for Disease Control, such as a Fact Sheet,⁷¹ a Tips for Counselors Sheet, and a “What to do if you think a person is having suicidal thoughts sheet.”⁷² Participants in the training program voluntarily completed the assessment survey prior to and after the training program. People were invited to complete the survey and offered a \$5 Starbucks card after completion of the survey. The survey was administered online via Survey Monkey through a link emailed to the participants before and after the training program.⁷³

Results of Training Evaluation Project

Participants

The survey was administered to 69 employees, 33 of whom participated in a training program and 36 who did not. Follow-up surveys were obtained from 23 people who completed the training and 21 who did not complete training. Demographics of the participants are reported in Table 5. As shown in Table 5, the average age of the respondents was 41.6 years, ranging from 22 to 78 years of age. All respondents had a high school education or equivalent with 16 being the complete number of years in school. An additional sample of students in a Master's program in counseling (Table 6) completed the assessment survey to generate a sample for comparison and normative purposes.

Table 5. Demographics on Entire Sample

Participants in Training	Pre Training	Post Training
N	33	23
Gender		
Male	14	8
Female	19	14
Age	22-63	22-63
Tenure	1-22	1-22
Education	GED – MA	GED – MA
Participants NOT in Training	Pre	Post
N	36	21
Gender		
Male	19	10
Female	17	11
Age	22-78	23-62
Tenure	1-30	1.5-34
Education	GED to PHD	GED to PHD

Table 6. Training Assessment Survey for Expert Comparison Group

Expert Comparison Group	
N	35
Gender	
Male	7
Female	28
Age	22-31
Education	MA's

The expert comparison group consisted of 35 people (Table 6) who were students in a Master's program and who had completed at least one year of course work and a practicum in mental health counseling. The sample was predominantly female (80%) with an age range of 22 to 31 years.

Results

Based on the inspection of these survey results, it is clear that there are a number of important attitudes related to suicide that the employees of the railroad held. As shown in Table 7, during the pre-test, the individuals responding to the pre-test survey revealed several key results including that employees agree that suicide is preventable. Such a finding is very promising.

Because not all of the people who completed the surveys were involved in the training, a somewhat smaller sample remained who completed the survey both prior to and after participating in the training. Nevertheless, the results in Table 8 show that there may be some changes following training. For example, nearly 75% reported that they would feel comfortable talking to someone about suicide post-training. The data were transformed into summary measures and participants matched for pre- and post-comparison.

Table 7. Pre-Test Descriptive Statistics on Attitudes toward Suicide

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Mean	SD
1. It is a sign of personal weakness to receive treatment for suicide	44 63.8%	17 24.6%	5 7.2%	2 2.9%	1 1.4%	1.5	.8
2. Many people who talk about suicide just want attention.	21 30.4%	28 40.6%	11 15.9%	7 10.1%	2 2.9%	2.1	1.0
3. Suicide prevention is not my responsibility.	29 42.0%	29 42.0%	8 11.6%	3 4.3%	0	2.0	.9
4. Asking someone if they are thinking about suicide may give them the idea to try it.	19 27.5%	29 42.0%	16 23.2%	5 7.2%	0	2.0	.8
5. If someone wants to kill him/herself there isn't much anyone can do to stop him or her.	27 39.1%	32 46.4%	3 4.3%	6 8.7%	1 1.4%	1.9	.9
6. People often attempt suicide without warning and out of the blue.	14 20.3%	35 50.7%	9 13.0%	7 10.1%	4 5.8%	2.1	1.0
7. You should not intervene with a person who might be suicidal unless you are sure the person is serious about suicide.	19 27.5%	39 56.5%	7 10.1%	4 5.8%	0	2.0	.8
8. Suicide is preventable.	1 1.4%	3 4.3%	9 13.0%	37 53.6%	19 27.5%	4.3	.7
9. Suicide prevention is a community responsibility.	2 2.9%	3 4.3%	14 20.3%	37 53.6%	13 18.8%	3.8	1.1
10. I would ask someone who was exhibiting the warning signs of suicide if they are thinking about suicide.	2 2.9%	4 5.8%	19 27.5%	38 55.1%	6 8.7%	4.0	.9
11. I feel confident that I can help, in some small way, prevent suicide.	0	5 7.2%	12 17.4%	40 58.0%	12 17.4%	3.9	.8
12. I feel prepared to recognize the signs of a person at risk of suicide .	0	19 27.5%	18 26.1%	27 39.1%	5 7.2%	3.6	.9
13. I believe I can recognize a person at risk for suicide.	2 2.9%	17 24.6%	33 47.8%	16 23.2%	1 1.4%	3.5	.9
14. I believe I can talk with a person to help determine if he or she is at risk for suicide.	1 1.4%	12 17.4%	28 40.6%	26 37.7%	2 2.9%	3.8	.8

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Mean	SD
15. I believe I can help a person at risk for suicide see a mental health counselor.	2 2.9%	2 2.9%	17 24.6%	44 63.8%	4 5.8%	3.9	.9
16. I believe I can effectively offer support to a person at risk for suicide.	1 1.4%	10 14.5%	21 30.4%	32 46.4%	5 7.2%	3.8	.7
17. I am prepared to help a person in a suicidal crisis.	6 8.7%	19 27.5%	17 24.6%	22 31.9%	5 7.2%	3.5	1.0
18. I believe I can ask a person at risk for suicide if he/she is suicidal.	0	10 14.5%	20 29.0%	35 50.7%	4 5.8%	3.8	.8
19. I'm comfortable talking about suicide.	0	7 10.1%	20 29.0%	37 53.6%	5 7.2%	3.8	.7
20. I do not feel anxious about talking to someone about suicide.	0	10 14.5%	21 30.4%	33 47.8%	5 7.2%	3.5	.9
21. I would call a crisis line to get help for someone at risk of suicide .	2 2.9%	1 1.4%	4 5.8%	46 66.7%	16 23.2%	4.0	.8
22. I would like to be given more information and support about suicide prevention.	2 2.9%	2 2.9%	15 21.7%	29 42.0%	21 30.4%	3.8	.9
24. I would like to take suicide prevention training.	1 1.4%	5 7.2%	15 21.7%	23 33.3%	25 36.2%	3.7	.7
25. Suicide prevention is not relevant to the transportation industry.	46 66.7%	16 23.2%	5 7.2%	1 1.4%	1 1.4%	1.8	1.0
26. I know the procedures in place if there is a suicide related incident at work.	15 21.7%	21 30.4%	17 24.6%	10 14.5%	6 8.7%	3.3	1.2
27. It is always possible to help a person with suicidal thoughts.	2 2.9%	13 18.8%	14 20.3%	30 43.5%	10 14.5%	3.5	1.0
28. Someone's decision to commit suicide can be reversed.	0	2 2.9%	17 24.6%	33 47.8%	17 24.6%	4.0	.8
29. There is a risk of evoking suicidal thoughts in a person's mind if you ask about it.	5 7.2%	28 40.6%	32 46.4%	3 4.3%	1 1.4%	2.3	.8
30. Suicide is a subject that one should not talk about.	25 36.2%	35 50.7%	7 10.1%	2 2.9%	0	1.7	.7

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Mean	SD
31. People who make suicidal threats seldom complete suicide.	6 8.7%	32 46.4%	27 39.1%	4 5.8%	0	2.3	.9
32. Communication of suicidal thoughts or plans is not serious.	28 40.6%	33 47.8%	5 7.2%	3 4.3%	0	1.8	.8
33. Suicide happens without warning.	9 13.0%	33 47.8%	17 24.6%	7 10.1%	3 4.3%	2.3	.9

Table 8. Post-Test Descriptive Statistics Attitudes toward Suicide

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Mean	SD
1. It is a sign of personal weakness to receive treatment for suicide	26 59.1%	15 34.1%	1 2.3%	1 2.3%	1 2.3%	1.5	0.8
2. Many people who talk about suicide just want attention.	13 29.5%	20 45.5%	7 15.9%	3 6.8%	1 2.3%	2.1	1.0
3. Suicide prevention is not my responsibility.	14 31.8%	18 40.9%	10 22.7%	1 2.3%	1 2.3%	2.0	0.9
4. Asking someone if they are thinking about suicide may give them the idea to try it.	13 29.5%	17 38.6%	13 29.5%	1 2.3%		2.0	0.8
5. If someone wants to kill him/herself there isn't much anyone can do to stop him or her.	14 31.8%	25 56.8%	2 4.5%	2 4.5%	1 2.3%	1.9	0.9
6. People often attempt suicide without warning and out of the blue.	12 27.3%	21 47.7%	8 18.2%	1 2.3%	2 4.5%	2.1	1.0
7. You should not intervene with a person who might be suicidal unless you are sure the person is serious.	12 27.3%	25 56.8%	4 9.1%	3 6.8%	0	2.0	0.8
8. Suicide is preventable.	0	1 2.3%	2 4.5%	24 54.5%	17 38.6%	4.3	0.7
9. Suicide prevention is a community responsibility.	2	4	10	15	13	3.8	1.1

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Mean	SD
10. I would ask someone who was exhibiting the warning signs of suicide if they are thinking about suicide.	4.5%	9.1%	22.7%	34.1%	29.5%	4.0	0.9
	1	2	4	26	11		
11. I feel confident that I can help, in some small way, prevent suicide.	2.3%	4.5%	9.1%	59.1%	25.0%	3.9	0.8
	1	1	5	30	7		
12. I feel prepared to recognize the signs of a person at risk of suicide.	2.3%	2.3%	11.4%	68.2%	15.9%	3.6	0.9
	1	4	13	21	5		
13. I believe I can recognize a person at risk for suicide.	2.3%	9.1%	29.5%	47.7%	11.4%	3.5	0.9
	1	4	16	19	4		
14. I believe I can talk with a person to help determine if he or she is at risk for suicide.	2.3%	9.1%	36.4%	43.2%	9.1%	3.8	0.8
	0	4	9	25	6		
15. I believe I can help a person at risk for suicide to see a counselor or mental health professional.		9.1%	20.5%	56.8%	13.6%	3.9	0.9
	0	5	4	27	8		
16. I believe I can effectively offer support to a person at risk for suicide.		11.4%	9.1%	61.4%	18.2%	3.8	0.7
	0	2	8	29	5		
	0	4.5%	18.2%	65.9%	11.4%		
17. I am prepared to help a person in a suicidal crisis.	2	5	10	23	4	3.5	1.0
	4.5%	11.4%	22.7%	52.3%	9.1%		
18. I believe I can ask a person at risk for suicide if he/she is suicidal.	0	3	8	26	7	3.8	0.8
		6.8%	18.2%	59.1%	15.9%		
19. I'm comfortable talking about suicide.	0	3	8	28	5	3.8	0.7
		6.8%	18.2%	63.6%	11.4%		
20. I do not feel anxious about talking to someone about suicide.	0	6	13	20	5	3.5	0.9
		13.6%	29.5%	45.5%	11.4%		
21. I would call a crisis line to get help for someone at risk of suicide.	0	3	3	27	11	4.0	0.8
		6.8%	6.8%	61.4%	25.0%		
22. I would like to be given more information and support about suicide prevention.	2	0	9	25	8	3.8	0.9
	4.5%		20.5%	56.8%	18.2%		

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Mean	SD
23. I would like to take a suicide prevention training.	1 2.3%	1 2.3%	11 25.0%	28 63.6%	3 6.8%	3.7	0.7
24. Suicide prevention is not relevant to the transportation industry.	20 45.5%	17 38.6%	5 11.4%	0	2 4.5%	1.8	1.0
25. I know the procedures in place if there is a suicide related incident at work.	3 6.8%	10 22.7%	7 15.9%	18 40.9%	6 13.6%	3.3	1.2
26. It is always possible to help a person with suicidal thoughts.	2 4.5%	5 11.4%	12 27.3%	19 43.2%	6 13.6%	3.5	1.0
27. Someone's decision to commit suicide can be reversed.	1 2.3%	1 2.3%	3 6.8%	29 65.9%	10 22.7%	4.0	0.8
28. There is a risk of evoking suicidal thoughts in a person's mind if you ask about it.	5 11.4%	26 59.1%	9 20.5%	4 9.1%	0	2.3	0.8
29. Suicide is a subject that one should not talk about.	16 36.4%	25 56.8%	2 4.5%	1 2.3%	0	1.7	0.7
30. People who make suicidal threats seldom complete suicide.	9 20.5%	18 40.9%	12 27.3%	5 11.4%	0	2.3	0.9
31. Communication of suicidal thoughts or plans is not serious.	16 36.4%	23 52.3%	3 6.8%	2 4.5%	0	1.8	0.8
32. Suicide happens without warning.	6 13.6%	26 59.1%	7 15.9%	4 9.1%	1 2.3%	2.3	0.9

Summary Measures of Training Effectiveness

To be able to discuss and deal with the data more economically, the various items were aggregated into three main categories: Self-Efficacy, Knowledge of Warning Signs, and Attitudes Toward Prevention and Training. Based on these categories, items were summed to form different measures and then analyzed for changes pre- and post-training.

A one-way analysis of variance was conducted comparing the scores on the three summary measures at post-test. The three summary measures were Self-Efficacy, Knowledge of Suicide, and Attitudes Toward Suicide. Each of these measures is described above and has adequate statistical reliability. As shown in Table 9, the only significant change at post-testing was a significant improvement in self-efficacy for the people who completed the training.

Table 9. ANOVA on Post-Test Measures following Training

		N	Mean	Std. Deviation	F	Sig. (p<)
Self-Efficacy	Treatment	23	3.9913	.62444	8.196	.007
	No Treatment	21	3.5000	.50000		
	Total	44	3.7568	.61432		
Knowledge of Suicide Facts	Treatment	22	1.1753	.23713	.698	.408
	No Treatment	21	1.2313	.19937		
	Total	43	1.2027	.21874		
Attitudes Towards Suicide	Treatment	23	2.7304	.43738	.046	.832
	No Treatment	21	2.7048	.34997		
	Total	44	2.7182	.39371		

As shown in Figure 20, the self-efficacy was higher at post-testing for those who participated in the training programs. This result indicates that respondents were more likely to agree with the statements that reflected their overall confidence in recognizing and identifying and speaking with people who were likely to exhibit some suicidal tendencies.

The other two scales, which measure knowledge of suicide and attitudes towards suicide, were not significantly different between people who participated in versus those that did not participate in training. This is somewhat surprising when considering factual knowledge regarding suicide. An inspection of the items that make up the scale revealed that the main change was that people were more likely to agree that simply talking about suicide would not necessarily lead to a suicidal act.

Finally, attitudes toward suicide did not change, and there was no significant difference between those who participated and those who did not participate in the training program.

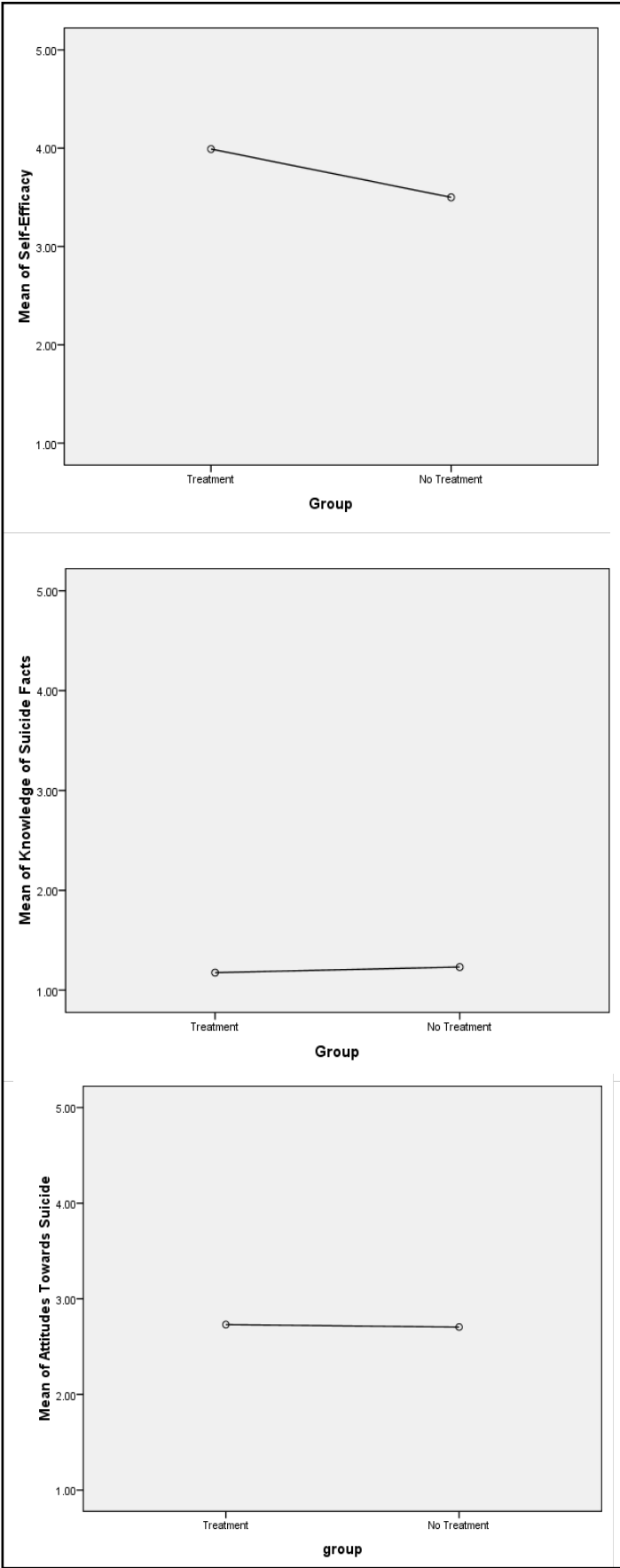


Figure 20. Community Attitudes Toward Suicide

As shown in Table 10, there were significant differences in self-efficacy for those who participated in the training as compared to those who did not participate with those; i.e., those who participated having higher levels of self-efficacy.

Table 10. Comparison of Means of Self-efficacy (Training vs. No Training)

Survey Items		N	Mean	F	Sig.
10. I would ask someone who was exhibiting the warning signs of suicide if they are thinking about suicide	Training	23	4.2609	4.796	.034
	No Training	21	3.7143		
	Total	44	4.0000		
12. I feel prepared to recognize the signs of a person at risk of suicide	Training	23	3.9130	8.282	.006
	No Training	21	3.1905		
	Total	44	3.5682		
13. I believe I can recognize a person at risk for suicide	Training	23	3.8261	9.083	.004
	No Training	21	3.0952		
	Total	44	3.4773		
14. I believe I can talk with a person to help determine if he or she is at risk for suicide	Training	23	4.0435	7.234	.010
	No Training	21	3.4286		
	Total	44	3.7500		
16. I believe I can effectively offer support to a person at risk for suicide	Training	23	4.0435	4.638	.037
	No Training	21	3.6190		
	Total	44	3.8409		
17. I am prepared to help a person in a suicidal crisis	Training	23	3.7826	4.351	.043
	No Training	21	3.1905		
	Total	44	3.5000		
18. I believe I can ask a person at risk for suicide if he/she is suicidal	Training	23	4.0870	5.335	.026
	No Training	21	3.5714		
	Total	44	3.8409		
26. I know the procedures in place if there is a suicide related incident at work	Training	23	4.0870	38.508	.000
	No Training	21	2.4762		
	Total	44	3.3182		
27. It is always possible to help a person with suicidal thoughts	Training	23	3.7826	3.928	.050
	No Training	21	3.1905		
	Total	44	3.5000		

Specifically, people participating in the training were significantly more likely to agree to:

- 10) Ask someone if they were considering suicide
- 12) Feel prepared to recognize the sign of a person at risk of suicide
- 13) Have greater confidence in being able to recognize a person at risk for suicide
- 14) Believe that they could talk to a person if he or she were at risk for suicide
- 16) Effectively support a person who is at risk for suicide

- 17) Feel prepared to help a person in a crisis
- 18) Ask a person if they were suicidal
- 26) Know the organizational procedures in place to help
- 27) Believe it's possible to help a person who is having suicidal thoughts (Table 6)

Discussion of Effects of Training

These data suggest that there is a significant impact that training programs can have on participants in comparison with those who do not participate in training programs. It is clear that, as a result of training, the participants—compared with non-participants—were much more confident of their ability to ask or talk to a person considering attempting suicide. In addition, they clearly felt that they could identify some of the signs that might indicate that a person was considering suicide. Finally, they also reported that they were more prepared to assist with someone who might be suicidal.

These data are limited due to the fact that they do not tell us however, if these new skills were ever put to use. Nor do they tell us how effective the interventions were with potential victims. Those questions remain unanswered. However, similar to other training programs and efforts, providing the knowledge and tools is no guarantee of how well they will be utilized or implemented.

The data from the training program does indicate that the participants knew what the organizational parameters were for their role in the field. This was a significant point of discussion in most of the training sessions. For the most part, the people working in the railroad industry do not expect to be mental health workers or social workers. They have hired on to perform specific tasks, and while most are willing to help, some people had considerable anxiety that their employers expected them to become suicide crisis counselors. Thus, it is extremely important to know that employees need clarification on these points, and that they will feel greatly relieved when these points are clarified.

It was also remarkable that the people attending these sessions felt quite relieved to be able to talk to each other about how they had responded to or handled various situations. Given that these are not necessarily job-related requirements, there is no formal mechanism for feedback or supervision of how to handle these events. It is not surprising that there is considerable anxiety associated with these types of situations, and the issue of railroad employees' reactions to traumatic or critical events on the railroad has been discussed and studied elsewhere (Sherry, 2011). Consequently, the need for social comparisons, validation, catharsis, and support cannot be underestimated.

Lastly, it is important to note that in general, the attitudes that people hold toward people who might be suicidal did not change. The items in this scale were related to attitudes toward understanding, helping and preventing suicide. Given the fact that they were fairly general, and also that they are longstanding attitudes, there was not much of an

expectation for change. But, in essence, training programs such as these do not create dramatic attitudinal change in the way that participants generally view people who are considering suicide. Only when the participants have been exposed to situations that seriously challenge their attitudes can one expect them to draw new conclusions and develop other attitudes.

PROJECT 3: COMMUNITY ATTITUDES TOWARD SUICIDE

As noted by Batterham et al. (2013), there has been very little research identifying specific gaps in public knowledge about suicide prevention. Given the limited financial resources of most public transit agencies, the benefit of identifying these gaps would be found in the ability to target specific types of educational information to specific locations and target groups by age, gender, and the like. Additionally, to develop successful targeted suicide prevention programs, it is necessary to focus efforts on key population groups most likely to benefit. Because most railroads engage in community awareness efforts, utilizing preventive signage and other public awareness campaigns, it was decided that another way to assess the impact of the training programs was to examine the impact on various community members. Additionally, gathering information about community awareness and attitudes towards suicides lays the foundation for evaluation of the success of community awareness efforts and ultimately, to prevention of railroad suicides. The purpose of this project was to assess community awareness and attitudes towards suicide on railroads.

Participants

In addition to the development and implementation of a training program for railroad personnel, the present project attempted to assess current community attitudes and then attempt to follow those sites and the attitudes toward suicide following an educational awareness intervention with the community.

Three sites were selected due to their efforts at involving the community in the activities of the railroad. These sites were selected and participants were recruited from samples from the community to complete the surveys. This was a random sample of a segment of the general population that attended a community event involving railroads. As such, the respondents are not likely representative of the entire population of the LA Metropolitan and Denver Metropolitan areas.

Survey Instrument

A survey instrument was devised that contained a number of items relevant to the community perception of suicide. These items were drawn from the research literature and other studies of community awareness. The survey consisted of several different items that assessed for a variety of attitudes toward suicide and suicide prevention and the railroad. The survey is included in Appendix 2.

The survey attempted to gather information about the attitudes that those community members hold toward people who have attempted to intentionally harm themselves or die by suicide. The idea behind most of the items was focused on what future interventions would consist of for subsequent training as well as what was the current state of knowledge.

Setting and Location

Five locations were selected and a number of participants obtained from each site:

Sample distribution (Figure 21)

- San Bernardino N=91 (Apr 27-28)
- Fullerton N=197 (May 4-5)
- LA Union Station N=103 (May 11)
- Denver University Station N=62 (May 21)
- Denver Union Station N=45 (May 9)
- Total N=498

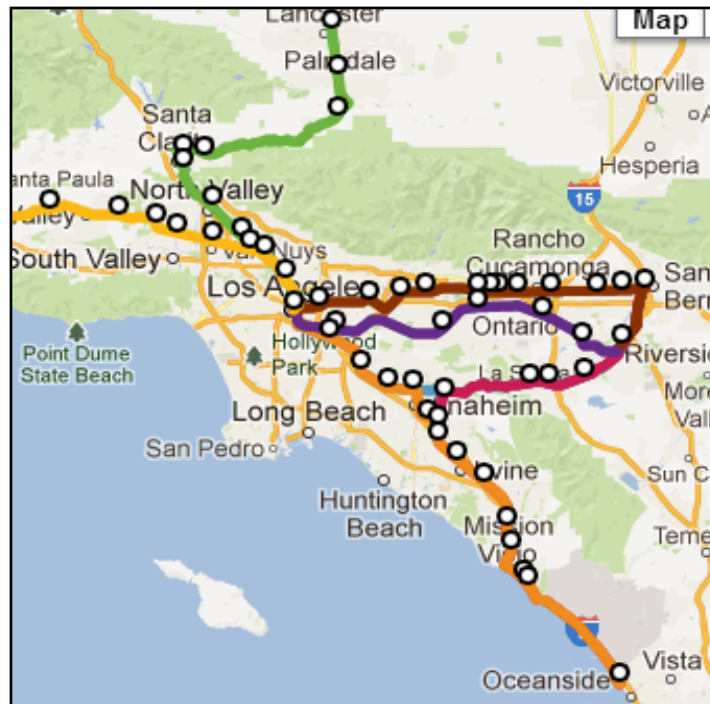


Figure 21. LA Metrolink Map

The sample was fairly evenly split between males and females. The age range of the respondents was from 13 years of age to 79 years.

Data Analysis

Descriptive statistics and comparisons of means between groups using t-tests and analysis of variance were the primary method of analysis. Some comparisons were made using comparisons of means.

Results of Analysis of Community Survey

Description of Study Participants

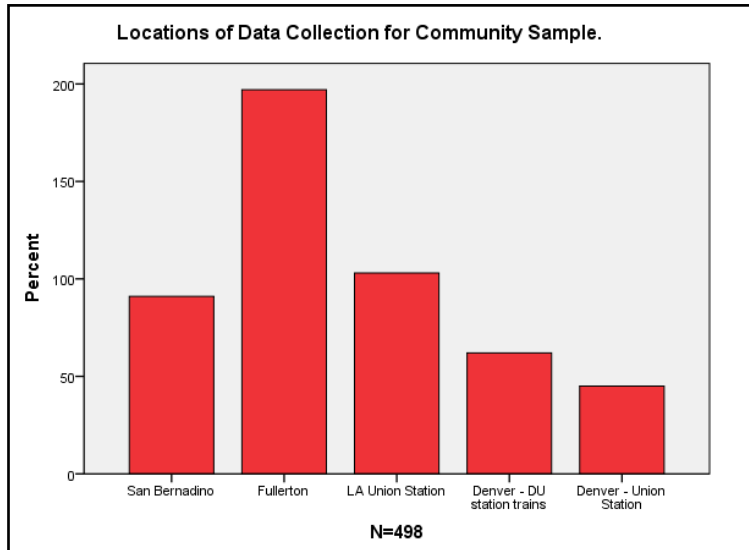


Figure 22. Locations of Data Collection for Community Sample

Table 11. Demographics of Community Sample

Age	Mean 45.75 Media 46.00 Std. Dev. 15.3	Quartiles 25-34 years 50-46 years 75-58 years
Gender	53.6% Male	46.4% Female
Race	White Black American Indian Asian Hispanic Other Multi-racial	44.4 5.2 0.3 8.6 14.2 4.9 3.4
Railroad Employee	5.7% (yes)	88.2% (No)
Education	High School Some College Associates Degree Bachelors Masters Doctorate Missing N=131	12.9% 8.2% 5.6% 27.3% 7.0% 0.6% 38.4%

Background of the Respondents

The community population was obtained by surveying several different locations in Los Angeles County and Denver County. In addition to the standard demographics, the respondents were also asked to provide information on their experiences with suicide. As was noted in Table 5, only 4.8% of the respondents had worked for a railroad. Several items were included to assess respondents' experiences with suicide. By answering "true" to the items, respondents indicated that they had indeed had some personal knowledge or experience with the situation described. From Table 12, one can see that about one-third of the community respondents had friends, acquaintances, or other associates who died by suicide.

Table 12. Knowledge of Someone Who Died by Suicide

	%
A close personal friend or relative died by suicide.	28.2
An acquaintance died by suicide.	30.7
A person I knew of, through work or school, died by suicide.	37.6
I know someone who was injured/killed on a railroad due to suicide.	8.5
I have not known anyone who died by suicide.	33.9

Location

There were some significant differences between locations for the community attitudes survey. These findings may indicate the need for rail transit agencies to develop more location specific and tailored community awareness efforts. Results of a one-way ANOVA comparing responses to the items are presented in Table 13. For example, there were significant differences by location for Item 1—"It is a sign of personal weakness to receive treatment for suicide." For this item, displayed in Figure 24, one can see that the location at the University of Denver Station was significantly lower than the San Bernardino respondents. Thus, transit agencies may wish to target locations not affiliated with university locations and focus instead on other areas. In addition, making the effort to assess community attitudes, the attitudes of ridership from specific locations, and other similar activities may lead to a more efficient use of limited resources.

Table 13. Means and Standard Deviations of Items in the Community Sample by Location

Location N	San Bernardino (N=90)		Fullerton (N=196)		LA-US (N=101)		Denver-DU (N=62)		Denver-US (N=45)		Total (N=494)		F	P<
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
	1. It is a sign of weakness to receive treatment	1.93	1.34	1.66	1.23	1.82	1.37	1.27	0.79	1.71	1.25	1.70			1.25	2.93	.020
2. Many people who talk about suicide want attention	2.56	1.29	2.57	1.31	2.37	1.40	2.15	0.99	2.04	1.04	2.43	1.28	2.70	.030
3. Suicide prevention is not my responsibility	1.97	1.25	1.97	1.12	1.93	1.29	2.18	1.05	2.10	1.28	2.00	1.18	.55	.699
4. Asking about suicide may give them ideas	2.06	1.04	2.27	1.25	2.29	1.26	1.89	0.79	1.60	0.88	2.13	1.15	4.37	.002
5. If someone wants to kill themselves there isn't much we can do	2.10	1.28	1.85	1.18	1.81	1.24	2.03	1.19	2.09	1.36	1.93	1.23	1.17	.325
6. People often attempt suicide without warning	3.04	1.36	2.52	1.43	2.95	1.53	2.26	1.17	2.58	1.41	2.68	1.43	4.46	.002
7. You should not intervene with a suicidal	1.95	1.15	1.88	1.16	1.98	1.26	1.85	1.08	1.83	1.12	1.91	1.16	.24	.914
8. Suicide is preventable	3.93	1.28	4.16	1.12	4.15	1.24	4.23	0.99	4.07	1.29	4.12	1.17	.81	.522
9. Suicide prevention is a community responsibility	3.93	1.27	3.93	1.15	3.91	1.25	3.95	0.96	3.83	1.23	3.92	1.17	.08	.989
10. I would ask someone exhibiting the warning signs	3.73	1.16	3.79	1.15	3.77	1.25	3.61	1.01	4.02	1.06	3.78	1.15	.88	.476
11. I know who to call for help if I feel suicidal	3.70	1.35	3.54	1.33	3.32	1.36	3.47	1.21	3.43	1.45	3.51	1.34	1.07	.373
12. I feel confident that I can help prevent	3.91	0.96	3.79	1.06	3.77	1.11	3.85	0.83	3.72	1.26	3.81	1.04	.37	.830
13. I feel prepared to recognize the signs			3.28	1.13	3.32	1.15	3.05	1.09			3.25	1.13	1.29	.276
14. I feel confident to help someone at risk of			3.25	1.13	3.42	1.20	3.05	1.03			3.26	1.13	2.09	.125
15. Talking about suicide will make them more likely	1.90	0.34	1.91	0.29	1.88	0.32	1.97	0.18	1.89	0.32	1.91	0.30	.98	.418
16. People who use alcohol are at a greater risk for	1.21	0.41	1.20	0.40	1.20	0.40	1.28	0.45	1.09	0.29	1.20	0.40	1.41	.229
17. If people are serious about committing suicide	1.52	0.53	1.61	0.49	1.56	0.50	1.74	0.44	1.74	0.45	1.61	0.49	2.84	.024
18. Leaving belongings on the platform is a sign	1.40	0.49	1.52	0.50	1.53	0.50	1.75	0.44	1.57	0.50	1.53	0.50	4.65	.001
19. Erratic behavior is an indicator of suicide risk	1.39	0.49	1.26	0.44	1.32	0.47	1.32	0.47	1.33	0.48	1.31	0.46	1.13	.340

Significant differences by location were obtained on seven of the items in the survey.

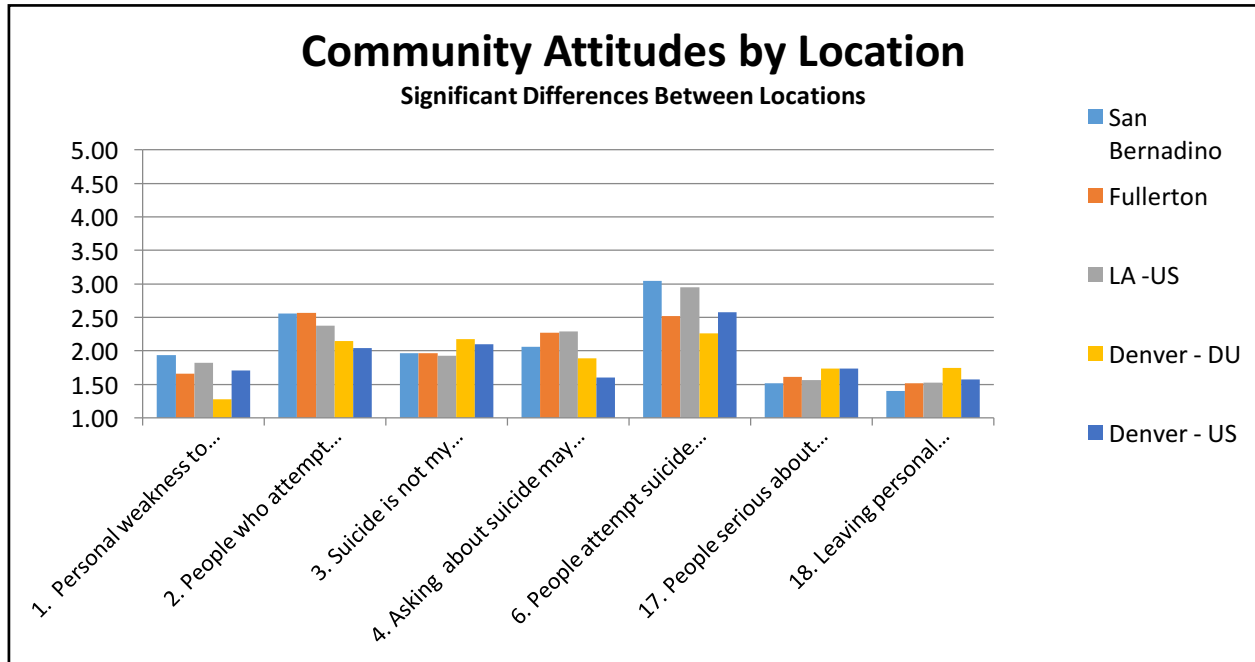


Figure 23. Community Attitudes by Location

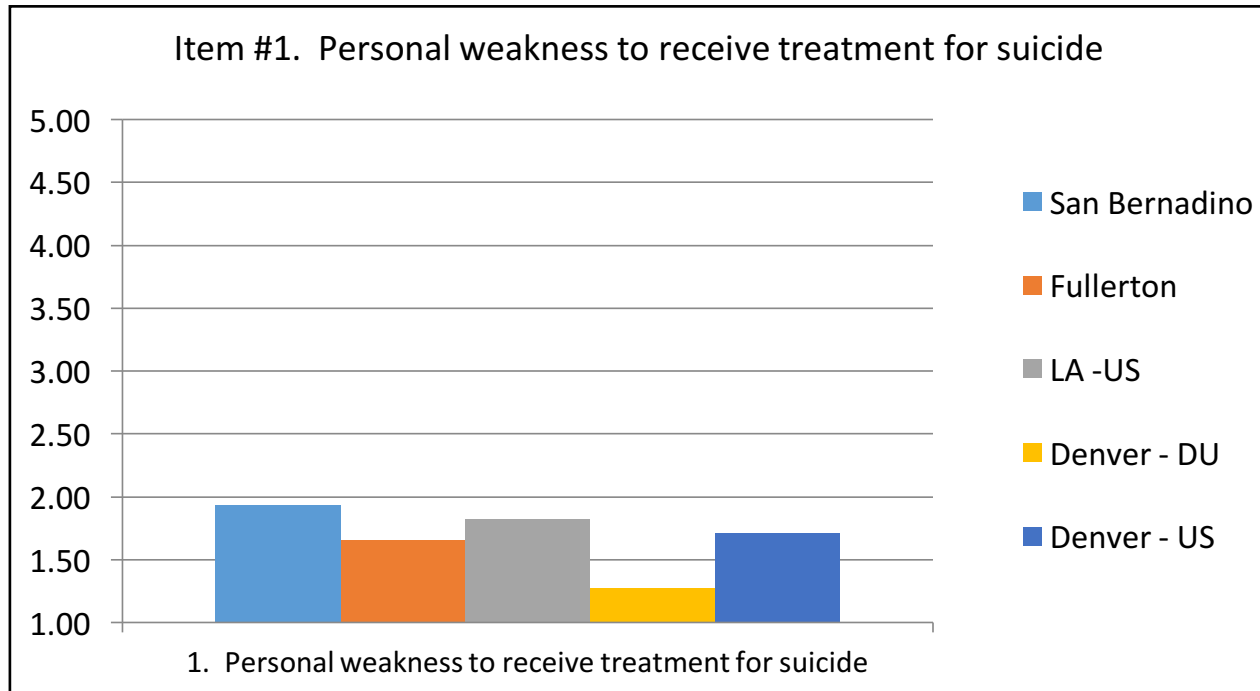


Figure 24. Mean of Item 1 by Location

Significant differences between locations were also noted on Item 2: “Many people who talk about suicide just want attention.” As shown in Figure 25, the University of Denver and Denver Union Station had lower mean scores on this item than did San Bernardino and Fullerton, indicating that Denver respondents generally disagreed with this statement.

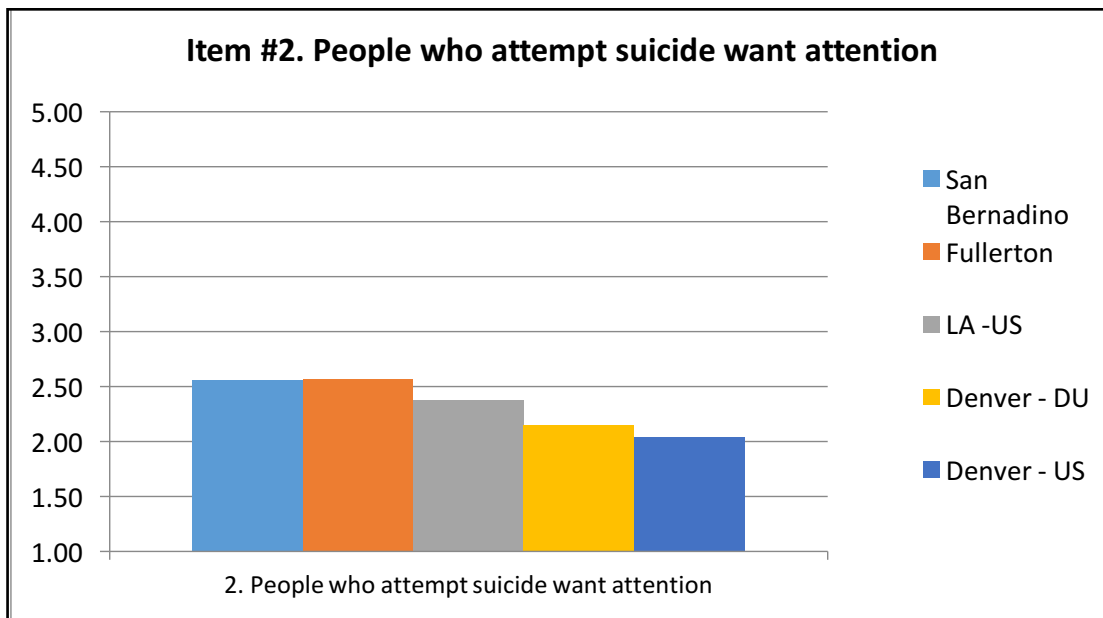


Figure 25. Many People Who Talk about Suicide Just Want Attention

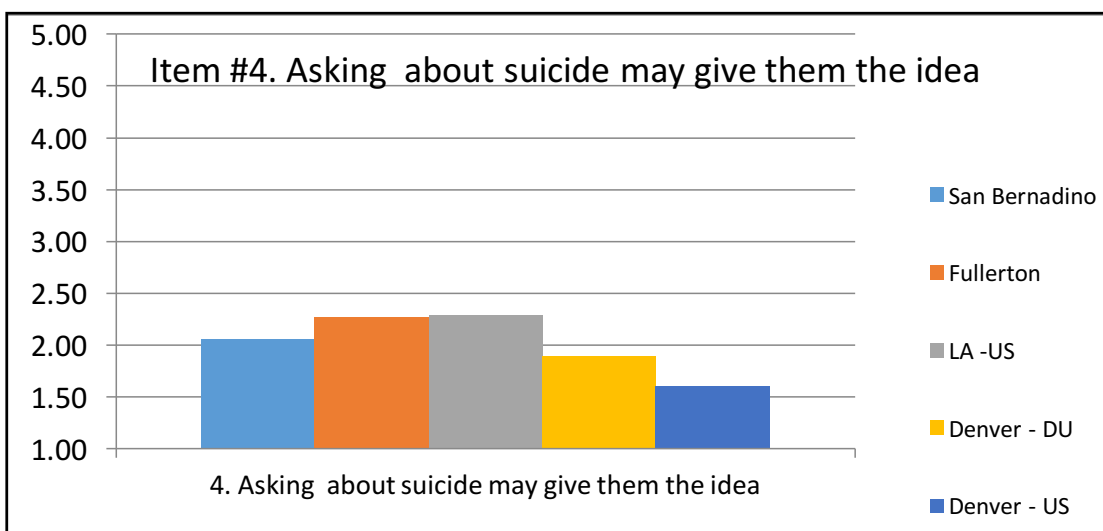


Figure 26. Item 4 – by Location – Asking about Suicide

Differences were also found between locations with respect to Item 4: “Asking if one is thinking about suicide may give them ideas.” One can see from Figure 26, the respondents in Denver had lower mean scores on this item, indicating that Denver respondents generally disagreed with this statement.

It was similar for Item 6: “People often attempt suicide without warning and out of the blue.” There were significant differences by location with people at University of Denver Station being more likely to disagree with the statement compared with people in San Bernardino or LA Union Station, and people in Fullerton were less likely to agree than respondents in San Bernardino and LA Union Station. (Figure 27) This suggests that additional educational efforts may be needed in the San Bernardino and LA Union Station locations.

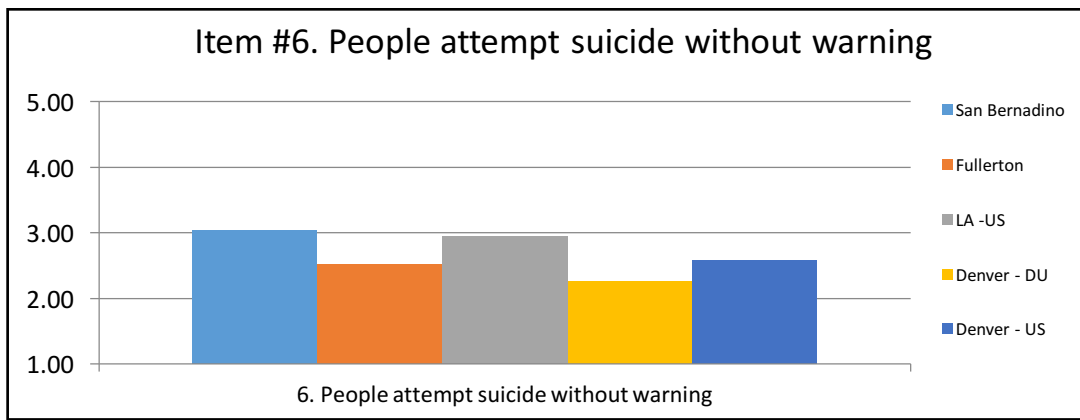


Figure 27. Item 6 by Location – People Often Die by Suicide without Warning

Finally, location differences were noted for Item 18: “Leaving personal belongings on the train platform is a sign that someone may be considering suicide.” This is a controversial item and may not have been worded in the most effective fashion. It may have been better to include the word “sometimes” or “possibly.” Nevertheless, it does give some indication that a person is considering suicide, but not in all cases. There were significant differences by location with people at University of Denver Station being more likely to agree with the statement when compared with people in San Bernardino, LA Union Station, or Fullerton (Figure 28).

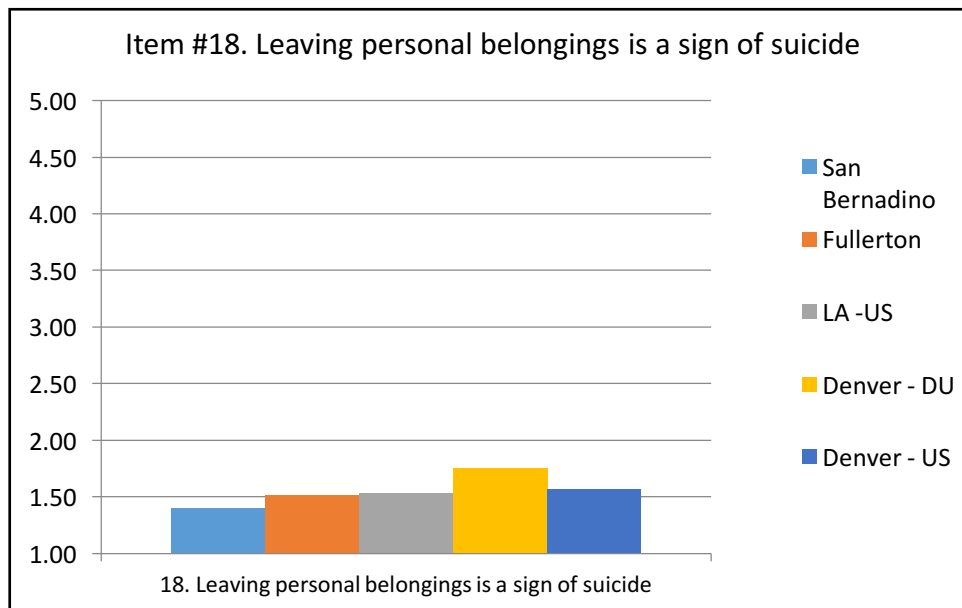


Figure 28. Item 18 – Leaving Belongings Is a Sign of Suicide Risk

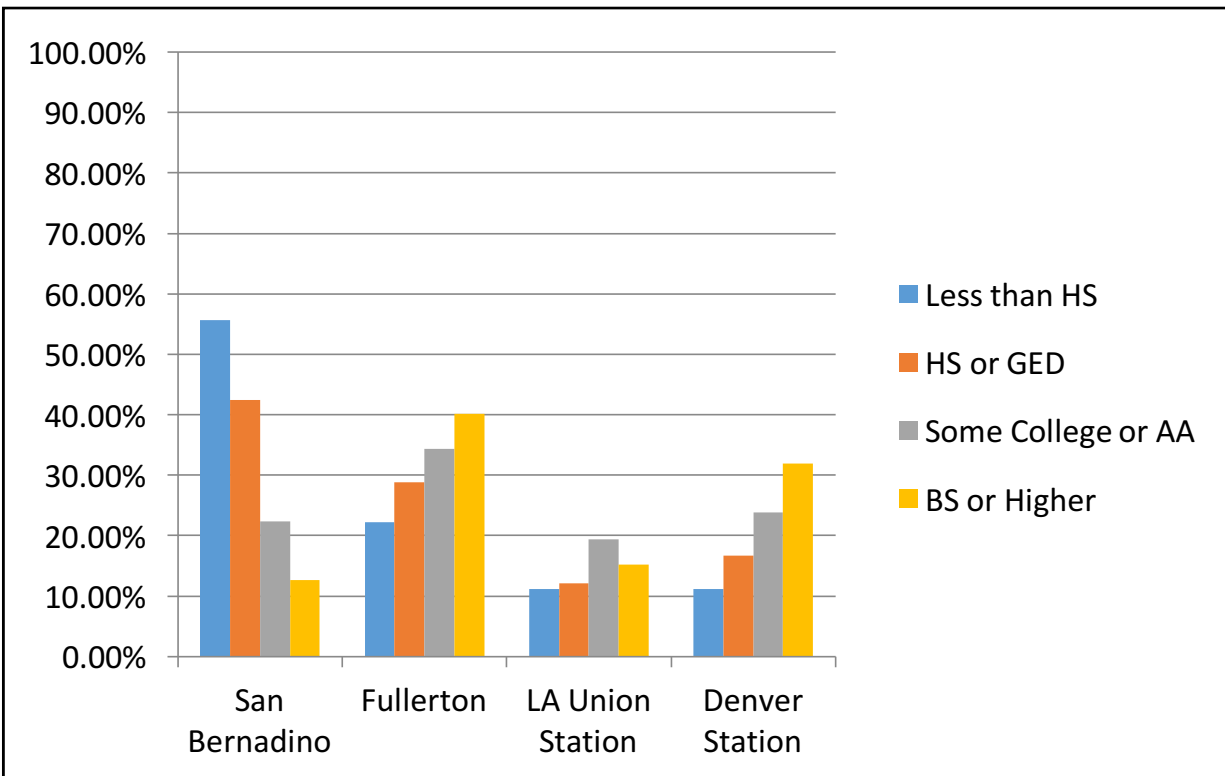
Education Attainment Differences

In trying to understand these differences by location, it was speculated that educational differences among the locations might account for the findings. Data obtained from the Town Charts database⁷⁴ (Table 14) suggest differences among the three locations studied.

Table 14. Educational Attainment by Location from Census Data⁷⁵

	San Bernardino	Fullerton	Los Angeles	Denver
Bachelors or more	27.7%	37.1%	31.1%	42.9%
Some college or AA	28.8%	30.5%	24.0%	24.0%
HS or GED	28.8%	18.5%	22.2%	18.5%
Less than HS	11.2%	12.4%	19.4%	13.1%

Based on this study's data, the locations do have some differences in educational attainment, with San Bernardino showing less educational attainment overall than the other three locations.

**Figure 29. Differences in Educational Attainment by Location**

In fact, significant differences on items by educational level were obtained for several items (Table 15). Visual inspection reveals that those groups with lower educational attainment are more likely to endorse statements that are less optimistic about intervening, and less likely to be congruent with current thinking about warning signs and response to interventions.

Looking at Figure 30, one can see that, in general, there is a trend toward the lower educational attainment group having higher means on the key items. For example, for Item 2, "suicidal people want attention," the trend is clearly evident. For Item 5 and 6, there is also a steady downward trend in the means as the level of education increases. For items 15 and 17, the trend is not the same. However, there are differences in these items that suggest that, while overall the agreement with the statements is low (less than 2.0 and near 1.5), there are some small differences, primarily from the "less than HS" group (N=9), which could be due to small cell sizes.

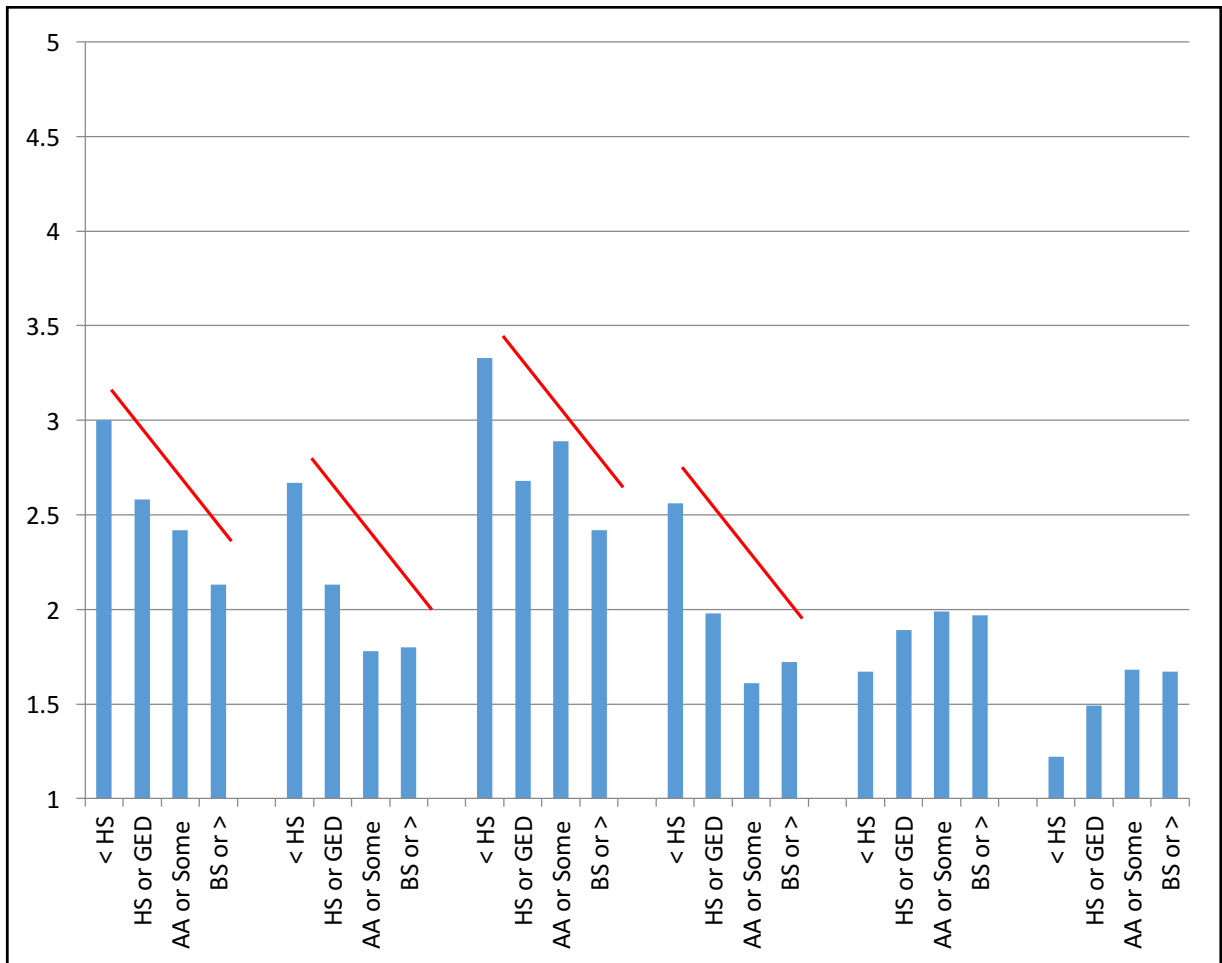


Figure 30. Items with Significant Differences by Educational Attainment

Table 15. Items with Significant Differences by Educational Attainment

Item	Educational Attainment	N	Mean	StdDev	df	F	Sig.
2. Many people who talk about suicide just want attention.	Less than HS	9	3	1.73	3	3.58	0.014
	HS or GED	66	2.58	1.43	342		
	Some College or AA	67	2.42	1.16	345		
	BS or Higher	204	2.13	1.15			
5. If someone wants to kill themselves, there isn't much we can do to stop them.	Less than HS	9	2.67	1.00	3	2.68	0.047
	HS or GED	63	2.13	1.50	336		
	Some College or AA	67	1.78	1.11	339		
	BS or Higher	201	1.8	1.11			
6. People often attempt suicide without warning and out of the blue.	Less than HS	9	3.33	1.32	3	2.87	0.036
	HS or GED	66	2.68	1.43	338		
	Some College or AA	64	2.89	1.45	341		
	BS or Higher	203	2.42	1.38			

Item	Educational Attainment	N	Mean	StdDev	df	F	Sig.
7. You should not intervene with a person who might be suicidal unless you are sure the person is serious about suicide.	Less than HS	9	2.56	1.59	3	3.33	0.02
	HS or GED	66	1.98	1.27	340		
	Some College or AA	67	1.61	0.85	343		
	BS or Higher	202	1.72	0.99			
15. Talking to someone about suicide will make them more likely to do it.	Less than HS	9	1.67	0.50	3	7.57	0
	HS or GED	65	1.89	0.31	340		
	Some College or AA	67	1.99	0.12	343		
	BS or Higher	203	1.97	0.18			
17. If people are serious about committing suicide, they don't tell anyone.	Less than HS	9	1.22	0.44	3	4.71	0.003
	HS or GED	65	1.49	0.50	333		
	Some College or AA	65	1.68	0.47	336		
	BS or Higher	198	1.67	0.47			

In summary, it is interesting to note a number of differences among locations relative to the attitudes that community residents have toward suicide. For example, the findings with respect to whether people will exhibit warning signs prior to engaging in suicidal behaviors suggest that different areas of the community may need higher and more specific types of community awareness and education efforts. In the era of tight budgets and limited resources, a two-pronged approach that assesses community attitudes along the right of way and then targets specific areas, possibly around hotspots, may be the most cost effective method for increasing awareness and suicide prevention.

Age Differences

A number of differences among survey respondents were also noted by age. An analysis of differences by age showed differences on Items 8, 10, 12, 13, and 18. As can be seen in Table 16, for the most part, the under-40 age group shows more agreement with the statements in the items than does the over-40 age group. Taken together, these items suggest that the under-40 group has a higher level of agreement with the idea that suicide is preventable, and it has a greater sense of confidence in being able to help someone who might be considering intentional self-harm.

Table 16. Age Differences within the Community Sample

Item	Group	N	Mean	SD	F	p<
8. Suicide is preventable.	<40	161	4.35	.97	11.70	.001
	>40+	230	3.95	1.24		
10. I would ask someone who was exhibiting the warning signs of suicide if they are thinking about suicide.	<40	161	3.88	1.05	4.88	.028
	>40+	231	3.61	1.22		
12. I feel confident that I can help, in some small way, prevent suicide.	<40	160	3.94	.90	4.64	.032
	>40+	229	3.71	1.09		
13. I feel prepared to recognize the signs of a person at risk of suicide	<40	135	3.36	1.08	5.43	.020
	>40+	178	3.07	1.13		
18. Leaving personal belongings on the train platform is a sign that someone may be considering suicide.	<40	157	1.64	.48	12.22	.001
	>40+	228	1.46	.50		

Looking at the age differences for a more differentiated perspective, one can see some significant variances (Table 17). Further examination of the results shows that, for the most part, differences among the age groups suggest that the older group may benefit from additional educational interventions (Table 17). Again, this group could be targeted for educational interventions or community outreach interventions.

Table 17. Community Sample Age Group Differences

		N	Mean	SD	F	p<
5. If someone wants to kill themselves, there isn't much we can do to stop them.	<20	22	1.68	.995	2.725	.013
	20-29	67	1.45	.822		
	30-39	99	2.03	1.257		
	40-49	95	2.09	1.392		
	50-59	92	1.87	1.131		
	60-69	47	2.15	1.474		
	70+	24	2.17	1.274		
	Total	450	4.12	1.162		
8. Suicide is preventable.	<20	23	4.43	.945	3.159	.005
	20-29	66	4.52	.949		
	30-39	100	4.22	1.011		
	40-49	96	4.05	1.173		
	50-59	91	4.00	1.300		
	60-69	49	3.69	1.388		
	70+	25	3.96	1.060		
	Total	450	4.12	1.162		
13. I feel prepared to recognize the signs of a person at risk of suicide.	<20	16	4.00	.894	2.931	.009
	20-29	52	3.29	1.210		
	30-39	78	3.38	.996		
	40-49	64	3.08	1.172		
	50-59	63	3.21	1.109		
	60-69	35	2.74	1.221		
	70+	16	3.19	.750		
	Total	450	4.12	1.162		

		N	Mean	SD	F	p<
15. Talking to someone about suicide will make them more likely to do it.	<20	24	1.71	.464	3.196	.004
	20-29	67	1.96	.208		
	30-39	100	1.93	.256		
	40-49	95	1.93	.263		
	50-59	93	1.92	.265		
	60-69	48	1.96	.202		
	70+	25	1.84	.374		
18. Leaving personal belongings on the train platform is a sign that someone may be considering suicide.	<20	23	1.57	.507	2.479	.023
	20-29	65	1.69	.465		
	30-39	97	1.58	.497		
	40-49	94	1.52	.502		
	50-59	89	1.49	.503		
	60-69	44	1.34	.479		
	70+	25	1.56	.507		

These results are generally consistent with Griffiths et al. (2008), who reported more negative attitudes towards depression in older respondents. While the present results address suicide in particular, they point to a need for additional educational efforts regarding suicide and suicide prevention targeted toward older community members.

Gender Differences

Several differences were found between male and female attitudes toward suicide. As shown in Table 18, for the most part, there were no significant differences between men and women in terms of their agreement or disagreement with the statements expressed in the survey statements. There were differences, however, such that men were more likely to agree with the three statements shown in Table 18. Specifically, men were more likely to agree that suicidal people want “attention,” that talking to them will give them the “idea,” and that there “isn’t much we can do to stop them.” Taken together, these findings reveal some interesting patterns. Most notable is that men seem to harbor more resistance to the idea of intervention and more pessimism about possibly being helpful. Again, it suggests that there might need to be more educational efforts directed toward males than females with respect to suicide prevention efforts.

Table 18. Gender Differences in the Community Sample

Item	Gender	N	Mean	SD	F	Sig.
2. Many people who talk about suicide just want attention.	Male	239	2.64	1.34	13.63	0.00
	Female	221	2.20	1.19		
	Total	460	2.43	1.29		
4. Asking if someone is thinking about suicide may give him or her the idea to try it.	Male	239	2.34	1.19	17.75	0.00
	Female	220	1.90	1.06		
	Total	459	2.13	1.15		
5. If someone wants to kill himself or herself, there isn't much we can do to stop them.	Male	233	2.05	1.32	6.02	0.01
	Female	218	1.77	1.10		
	Total	451	1.91	1.22		
A person I knew of, through work or school, died by suicide.	Male	234	1.57	0.50	6.68	0.01
	Female	216	1.69	0.46		
	Total	450	1.63	0.48		

Consistent with previous research (Griffiths et al., 2008), the present results indicate that women have less negative attitudes toward suicide than males. However, there has been very little research identifying specific sub-groups of the population that hold stigmatizing attitudes or reduced literacy regarding suicide (Batterham et al., 2013). Similarly, Cerel, Bolin, & Moore (2013) also found that college-age women were also more likely to see suicide as a problem than men. Taken together, these results point to the need to develop community awareness efforts that target populations based on age and gender groupings. Targeting these populations in and around railroad facilities may contribute more successful prevention.

Community Ownership

In terms of the key responses to the survey, it is important to recognize that the community in general feels a sense of responsibility for preventing suicide. Specifically, two items addressed suicide as a community responsibility. In response to those items, the respondents overwhelmingly said that suicide prevention is a “community responsibility” (Figure 31), with 70.5% of the respondents either agreeing (30.5%) or Strongly Agreeing (40.0%) that “Suicide prevention is a community responsibility.” In addition, 79.5% of the respondents agreed with Item 8 (“Suicide is preventable”), with 50.3% strongly agreeing, and 29.2% agreeing with the statement.

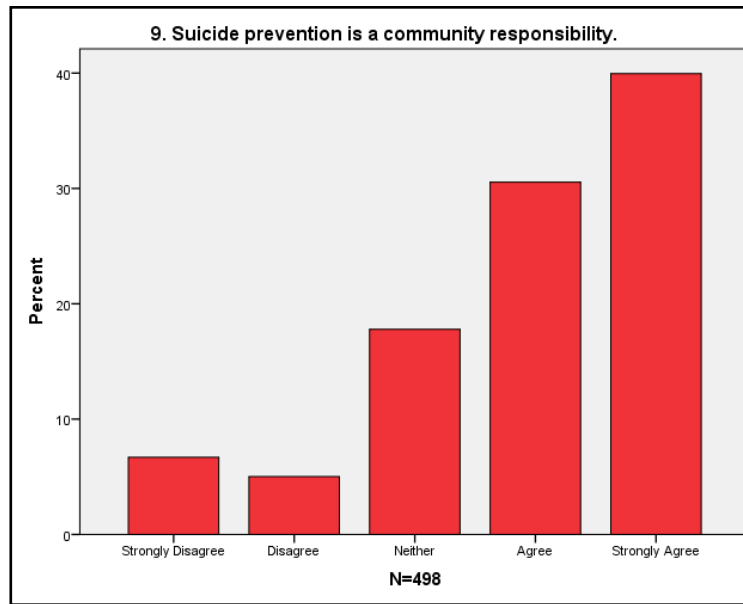


Figure 31. Item 9 – Suicide Prevention Is a Community Responsibility

Additional insight into community attitudes is obtained when one looks at responses to item 10, for example—“4. Asking if someone is thinking about suicide may give them the idea to try it.” Community response to this item is presented in Figure 32. The histogram in Figure 32 shows the distribution with 38.4% of the respondents endorsing “strongly disagree” and 28.0% “disagree,” for a total of 66.5% of respondents disagreeing with the statement.

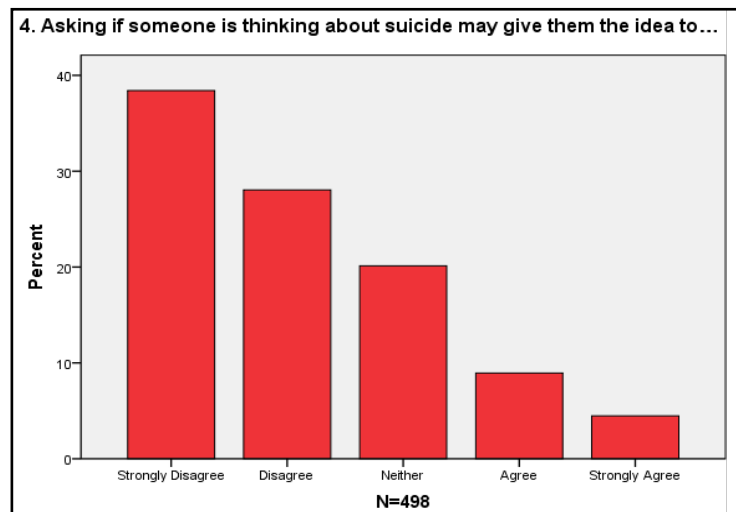


Figure 32. Item 4 – Perception of Consequences of Asking if Someone Is Suicidal

Similarly, most people disagreed with the statement presented in Item 5 (“If someone wants to kill themselves, there isn’t much we can do to stop them”) displayed in Figure 33. As depicted, 50.9% strongly disagreed with this statement, and another 25.9% disagreed, for a total of 76.8% disagreement. These data indicate that people feel that suicide can most likely be prevented.

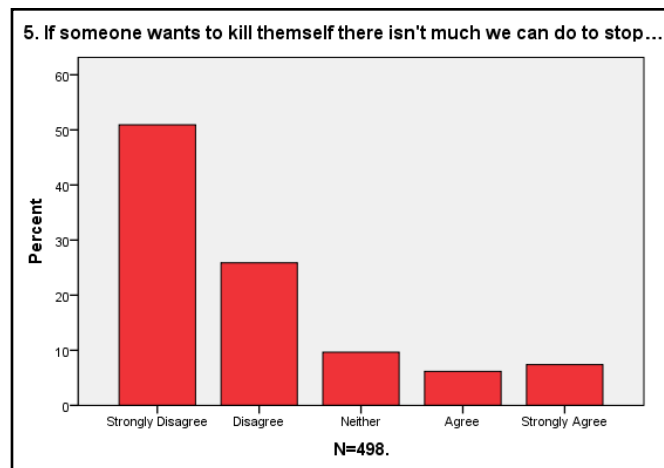


Figure 33. Item 5 – What Can Be Done?

Community attitudes toward prevention of suicide suggest a high degree of belief that prevention efforts are valued. Results from a study by Robinson, Braybrook, & Roberston (2013) in Scotland suggest that community awareness efforts focusing on the public as a key “influencer” in the role of prevention, using public transport as a means of displaying messages, and targeting groups by age and gender is a very promising approach. These results are consistent with other findings and point to the need for transit railroads to coordinate their efforts with other community oriented approaches to target community populations as key partners in prevention efforts.

Recognizing Symptoms

Community response to the questions about recognizing symptoms was also examined. For example, most people disagreed with the statement presented in Item 6, “People often attempt suicide without warning and out of the blue.” As seen in Figure 34, 27.3% strongly disagreed with this statement, and another 25.1% disagreed, for a total of 52.4% disagreement. Thus, these data indicate that a little over one-half of the community members feel that suicide does not occur out of the blue.

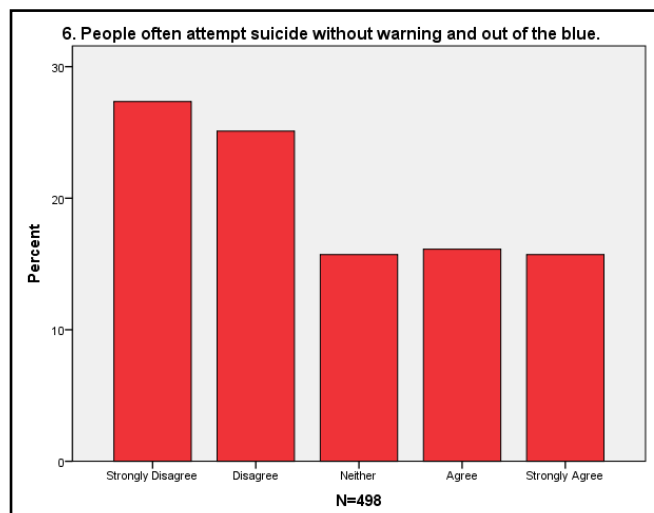


Figure 34. Item 6 – People often Attempt Suicide without Warning

Interestingly, Item 18 on the survey, “Leaving personal belongings on the train platform is a sign that someone may be considering suicide. (T/F)” (Figure 35) also indicated that members of the community sample were not certain about the significance of this behavior. Clearly, someone could forget their belongings, but in the context of suicide, the deliberate act would indicate ambivalence about living.

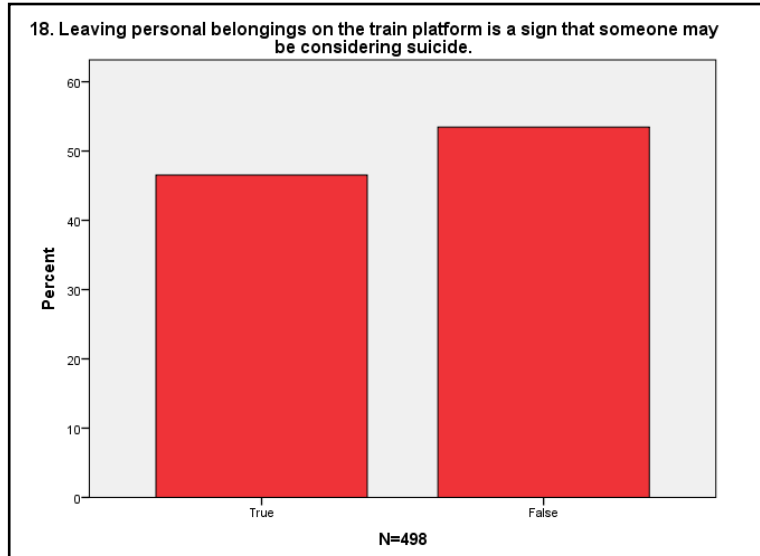


Figure 35. Item 18 – Leaving Belongings on the Platform

Another key issue is the ability to recognize the signs and symptoms that might precede an attempt to intentionally harm oneself. The community sample responded to Item 13: “I feel prepared to recognize the signs of a person at risk of suicide.” Figure 36 shows that 27.3% strongly disagreed with this statement, and another 25.1% disagreed, for a total of 52.4% disagreement. Thus, these data indicate that a little over one-half of the community members feel that they are prepared to recognize the signs of suicide.

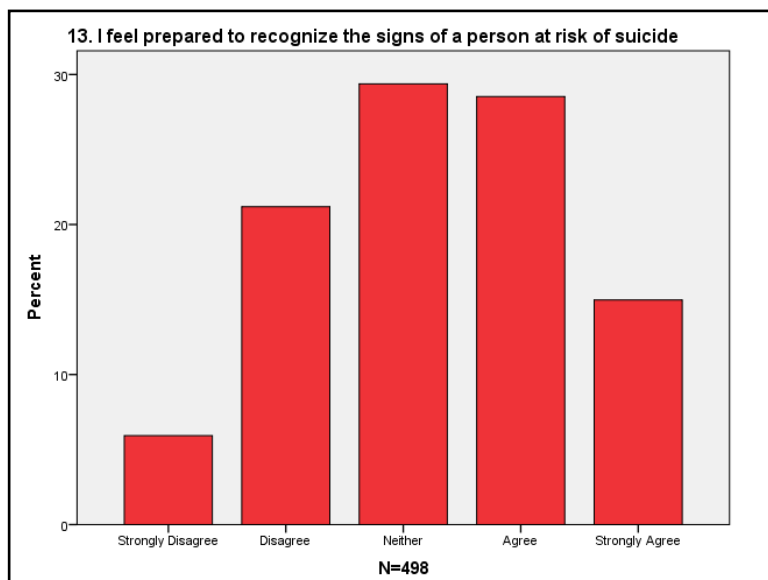


Figure 36. Item 13 – I Feel Prepared to Recognize Signs of a Person at Risk

Taking Action

Awareness of suicide and the knowledge of risk factors finally converge in possible action. Several items in the survey addressed the extent to which respondents would feel comfortable taking some steps to address the situation. There was also considerable agreement on item 10: “I would ask someone who was exhibiting the warning signs of suicide if they were thinking about suicide.” A large percentage agreed (36.4%) and also strongly agreed (30.7%), for a total of 67.1% agreement (Figure 37). This result lends further support to the notion that people in the community would like to help with the problem, and that they would go so far as to ask the person a question if they were concerned or if they noticed some problems.

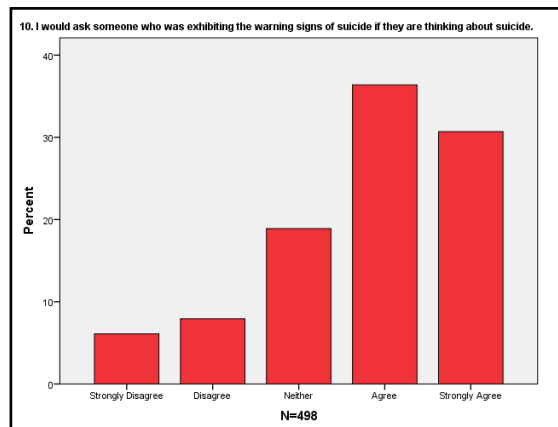


Figure 37. Item 10 – Asking about Warning Signs

However, while they feel responsible and want to help, the community as a whole demonstrated only a moderate amount of confidence in being able to help people who might be intent upon harming themselves. For example, Item 14: “I feel confident in my ability to help someone at risk of suicide.” A total of 28.0% agreed, and only 15.3% strongly agreed, for a total of 43.2% agreement (Figure 38). This result suggests that the majority of respondents is uncertain and *lack confidence* regarding how to respond to people who might want to intentionally harm themselves.

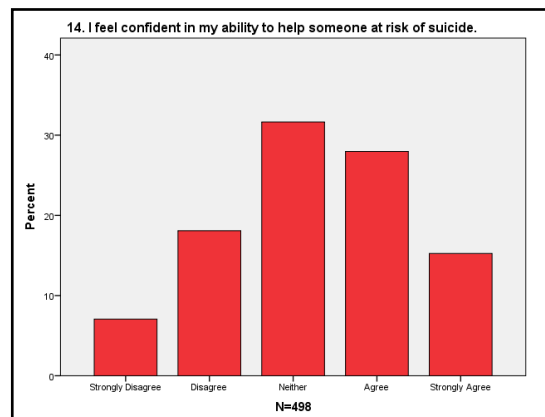


Figure 38. Item 14 – Confident of Ability to Help Someone

This attitude is further reflected in the community response to Item 15: “Talking to someone about suicide will make them more likely to do it. (True/False).” A total of 90.3% of respondents *disagreed* with this statement (Figure 39). This result suggests that the majority of respondents, while uncertain and lacking confidence, realize that they will not harm a person by asking them about their intentions. This attitude is also shared by the majority of mental health professionals. Thus, community members also believe that talking about it will not increase the likelihood of completion.

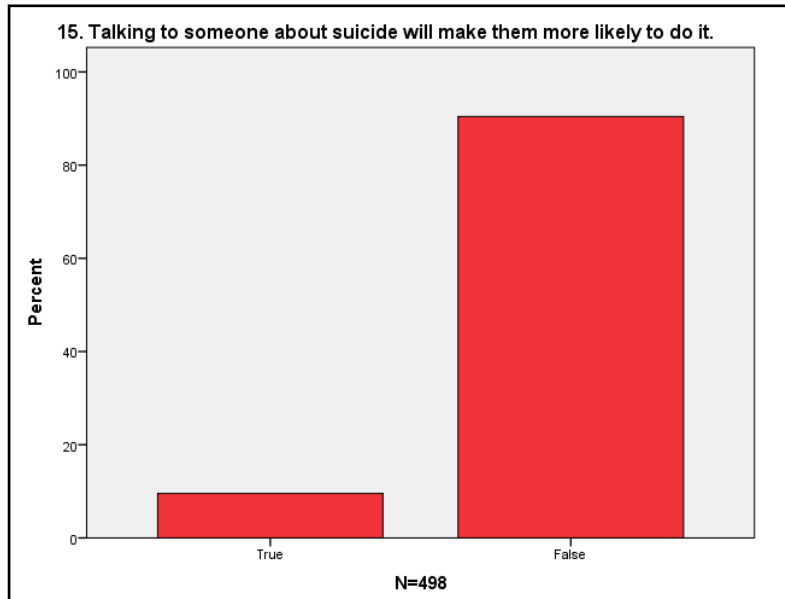


Figure 39. Item 15 – Percentage Reporting that Talking More Likely to Harm

One more item relates to this, namely, Item 14: “I feel confident in my ability to help someone at risk.” As shown in Figure 40, only 15.3% strongly agree with this, and only 25% disagreed. Clearly, people in the community are at a loss about how to respond.

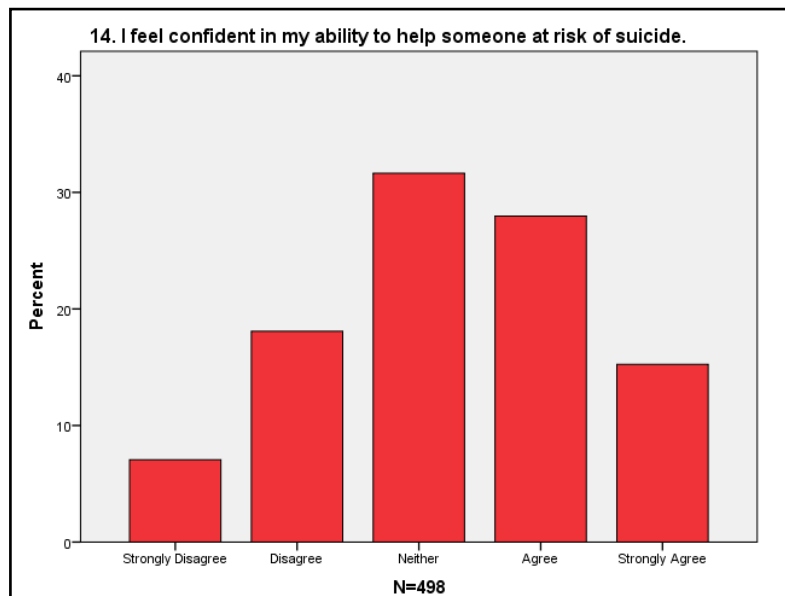


Figure 40. I Feel Confident in My Ability to Help Someone at Risk

Summary of Community Awareness Survey

Results of the community survey suggest that the majority of respondents feel a strong sense of ownership and community responsibility to assist and prevent those who seek to intentionally harm themselves by using the transit system. Recognizing symptoms was an area with some variability and uncertainty. People were nearly evenly split on whether leaving belongings behind was a warning sign. Also, people were split on whether suicide occurs without warning, with about a 50/50 split. Therefore, it seems that community awareness of the signs that a person is considering harming themselves or taking their own life could also be improved. Lastly, the idea of an individual taking some form of preventive action was examined. Two-thirds of the respondents agreed with the need to “ask someone” if they were considering suicide. But only 43% of respondents felt confident in their “ability to help.” In other words, the data suggest that people want to help but are somewhat uncertain about what to do.

Discussion and Recommendations

The three projects undertaken in this study have reviewed the literature related to suicide, railroad suicide, and suicide prevention; examined the effectiveness of an employee suicide prevention training program; and gathered data on the initial effects of community awareness and community attitudes toward suicide on the railroads. Results of the literature review identified the problem of suicide worldwide and its growing trend. In addition, the literature review summarized the various risk factors and provided a profile of characteristics of people likely to die by suicide on the railroad.

Recommendation 1:

Railroad employees need ongoing and continuing training on the warning signs and risk factors for suicide. Training will increase awareness and self-efficacy for assisting those in need.

An additional review was conducted to determine the various types and methods of prevention that were being used by members of the commuter rail transit industry. It was determined that most of the existing railroads are using efforts to identify and block hotspots, although not all railroads have hot spots. Additionally, railroads are training their employees to identify, spot, and assist potential suicides. Results of a pre-post evaluation about the effectiveness of a training program were shown to have a positive impact on employee self-efficacy but no effect on knowledge of symptoms. An overall change of individual community attitudes toward suicide was not seen as a result of training. However, a greater sense of confidence and self-efficacy in being able to be of help was seen. It was determined that a training program for people in a railroad company positively influenced employee attitudes toward suicide and being able to help those at risk. In addition, community attitudes toward rail-related suicide were assessed. It was found that most people in the community are concerned about the problem and feel some degree of responsibility to help alleviate it.

Recommendation 2:

Suicide-awareness training programs should set clear boundaries and guidelines for railroad employees regarding their responsibility and what is expected and not expected in specific roles. People who have immediate customer-facing roles are likely expected to have more responsibility to assist or intervene.

With respect to training railroad employees, the results of this evaluation show that the training program has a positive effect on increasing employees' sense of self-efficacy and confidence in their ability to identify and help people who might be contemplating suicide. A training program that covers the signs, symptoms, and risk factors associated with suicide is useful in that it heightens awareness of the potential for passengers or trespassers to harm themselves. However, it should be noted that most railroad employees have no desire to be social workers or mental health workers and that being responsible for preventing suicides is not a task that they feel particularly drawn to. Thus, a key aspect of the suicide-awareness training program is to set the boundaries and guidelines about what is acceptable and necessary from employees in specific roles. Those people who have immediate customer facing roles are likely to be expected to have more responsibility to assist or intervene.

Another key aspect and benefit of such training programs is to provide an opportunity for employees to share experiences with each other and to receive support from their peers for dealing with these incidents. Anecdotally, several participants expressed gratitude and relief for being able to talk with their co-workers about their attitudes, feelings, and frustrations in dealing with these types of incidents. Typically, the supervisory structure does not contain opportunities for employees and managers to debrief following these incidents. Providing regular training enables employees to have a designated time for managing the emotions and concerns that arise after handling these incidents. In fact, Bardon & Mishara (2015) reported on the negative effects of suicides on the psychological well-being of persons who work in the industry. By availing railroad employees of suicide prevention training, there will likely be a positive inoculation against the negative consequences of being exposed to railway suicides. At the very least, railway employees will be better prepared to identify potential negative reactions and be more aware of sources of assistance for dealing with those reactions.

Recommendation 3:

Different groups of individuals will use the railroad as a means of intentional self-harm and thus will need multi-faceted educational and preventive interventions.

For the most part, the issue or phenomenon of people using trains to intentionally harm themselves is highly disturbing, not to mention that it creates a considerable cost for users of the systems. At first glance, it appears that there is little to be done if people actually want to harm themselves—short of putting physical barriers up along the right-of-way, which is highly impractical. The data show that a small percentage of the actual total number of suicides in the USA use the railways to intentionally harm themselves. In some cases, this is around 5% to 7% (e.g., New York City is 7%) of all suicides in a general geographical

area. However, it is probably less than 1% of the entire number of suicides that occur nationally. Nevertheless, this amounted to 310 rail related documented deaths by suicide in 2013 according to the FRA. In some locations and for unknown reasons, however, more intentional deaths occur among people who are trespassers on railroad property. The issue here is that railroad trespassers in general are somewhat different from people who wish to intentionally harm themselves. Thus, the types of interventions that will work for one person may not necessarily work for another. Trespassers who use the railroad to die by suicide may be more deliberate and motivated—by economic pressures for example—than non-suicidal trespassers who may be intoxicated, temporarily upset, and not suffering from long term psychiatric illness. Or they simply may be taking shortcuts through railroad property. Targeting those who are potentially suicidal in general would not be the same as targeting those who might use the rail for intentionally harming themselves; they have different characteristics. In fact what emerges from the review of the literature, supported in large part by the FRA report defining characteristics of intentional fatalities (FRA, 2013), is that the person who is most likely to be involved in railway-related suicides have the following key characteristics (Table 19).

Table 19. Key Characteristics of Railroad Suicide Victims

-
1. Male and under 50 years of age
 2. Have had or are having some involvement with alcohol and or drugs
 3. Highly likely to be suffering from depression or other mental disorder
 4. Highly likely to have a substance abuse disorder
 5. Likely have no other means of suicide (e.g., firearms)
 6. Likely to seek access to high-density regularly scheduled train traffic areas
 7. Likely to live within close proximity of the railroad, either living alone or renting
 8. Highly likely to have been experiencing economic or financial stressors for some time. (e.g., layoffs, unemployment, recession, debts etc.)
-

The types of prevention activities for this group of individuals would be multi-faceted. In the first place, barriers and blocked or limited access would be helpful. The profile suggests that there will be people who are seeking to harm themselves, so they are looking for a method that will provide the desired outcome. The data also suggest that they may be looking for scheduled trains that run with a high frequency. It is this group that perhaps is likely to target stations or platforms with a high number of train stops. Thus, creating barriers around these locations might be beneficial.

In addition, the use of drones and television or closed circuit surveillance systems could be beneficial where physical barriers are not feasible. Also, the use of trespasser intrusion systems in conjunction with video-equipped aerial drones could offer some additional deterrence. Drones could be equipped with two-way communication devices to help observers communicate with trespassers who could be intent upon harming themselves.

Recommendation 4:

Barriers are needed, but they are not sufficient, as some individuals who are intent upon self-harm will circumvent the barriers.

A certain number of individuals will find alternatives to the barriers. The literature reviewed suggest that people using the railroad for self-harm may be looking for a means or a method that is highly reliable with respect to lethality, and that they may lack access to other methods such as firearms. Thus, their proximity to the railroad and lack of other means suggest some limitations in resources, such as a home or a weapon. But the data also suggest that they are more deliberate in their approach than those who use a more impulsive approach with firearms. This would suggest even more reason to identify people who are living alone or renting in the vicinity of the railroad and to target interventions toward them.

Recommendation 5:

Community identification, consultation, and engagement with people who live and reside in the immediate area who are dealing with alcohol and substance abuse or some form of mental disorder would likely be of value.

Another area for possible intervention is in identifying people in the immediate area who are dealing with alcohol and substance abuse or some form of mental disorder. Some data suggest that there may be an association between the location of mental health treatment facilities and railway suicide. Results of a large-scale study of military veterans showed that a large percentage of people dying by suicide had been seen by a health care professional in the 12 months before the event. Such a finding suggests that members of the health care community and others were in contact with the person before the event occurred. Perhaps a more aggressive community engagement program would be beneficial in addressing the needs of these individuals. As seen from the community awareness survey, people in the community want to help but are not confident of their ability to do so. As Mishara (2007) noted, there have been “no published studies on the effectiveness of railway and metro suicide prevention programs that target specific high-risk populations.” Additional research on the motivations and characteristics of these individuals, as well as possible community efforts and interventions to address their needs, would be most helpful.

Recommendation 6:

Anticipate increases in numbers of suicides when economic conditions are poor, and develop more aggressive outreach programs.

The other major issue relative to the cause of suicide, with railroads and in general, has to do with economic factors. Results show a strong correlation between negative economic factors and the occurrence of suicide. As noted above, it may be that the lack of financial resources is one reason that people choose the railroad as a means or mechanism for intentional harm. Classen & Dunn (2012) using their regression analysis estimated an increase of one suicide for every 4,200 males affected by layoffs. Perhaps railroads can identify ways to support economic development or temporary jobs in their immediate

areas. Classen & Dunn calculated the positive benefits of investments from \$35 to \$175 per worker that would reduce the number of suicides directly. While the railroads cannot be expected to eliminate unemployment, the awareness of the problem and the links could prove useful in planning and preparation.

Recommendation 7:

Community members and organizations should be encouraged to take a more active role in suicide prevention.

Research on the role of unemployment also supplements the previous findings regarding the lack of identifying people with depression or other mental disturbances. Essentially, people most in need of assistance are least likely to come to the attention of the community agencies that can provide it. People who are depressed are also less likely to ask for help. Thus, efforts to reconstitute the social network that can provide support to depressed (and likely unemployed) people would be beneficial. Results of the Community Awareness Survey indicate that community members feel responsible and would like to assist with the problem. Thus, the efforts of engaging the larger community are likely to be supported but may require some organization and direction. People seem to want to help but aren't sure what to do.

Recommendation 8:

Suicide prevention efforts must be targeted in and around the immediate area of the railroad stations or platforms and also along railroad tracks in general because there are few identifiable "hotspots." Perhaps more monitoring of the tracks using remote sensing, motion detectors, and video feeds would be helpful.

Transit railroad agencies have some responsibility for ensuring that members of the community are aware of the dangers to the public associated with train operation. Warning signs, fencing, lighting and other measures have been accepted industry practices for many years. However, only recently has the idea of warning about the risk of suicide been attempted. Based on this report's review and findings, suicide prevention efforts must be targeted in and around the immediate area of the railroad stations or platforms. However, with the increased proliferation of monitoring technologies, video surveillance, drones, motions detectors, and the like, more could be done to monitor trespassers on the rail right-of-way.

Recommendation 9:

It would be helpful to develop a more aggressive general community engagement effort in high-risk areas near the railroad.

Railroads should not go it alone. Intentional death using the railroad is the result of a larger set of societal issues, including mental health and economic conditions, to name a few. Greater emphasis on involving the community, merchants, mental health agencies, police, clergy, and suicide prevention organizations, etc. in a more ecologically based intervention

approach is necessary to be successful. Pooling resources and sharing knowledge of the railroad system and the location of intentional fatalities with these groups could aid their efforts and increase effectiveness of all prevention programs. The efforts of the Boston community (MBTA and MBCA) with the Samaritans organization is commendable, as a community organization is involved with the railroad in addressing what is a problem affecting the community.

Recommendation 10

The efforts of Operation Lifesaver (OLI) must be commended but expanded. The OLS personnel could also increase their discussion about the possibility of suicide, intoxication, and other forms of mental illness.

A close review of the literature regarding suicide and the railroad suggests that suicide is a public health, community, and societal problem. The roots of the problem stem from individual mental disorders and substance abuse plus the contributing effects of life stressors and the economy. Perhaps railroads should take a more active role in collaborating to promote community awareness. The efforts of Operation Lifesaver (OLI) might be broadened, for example, to include assisting the community or directing the efforts of the community. Operation Lifesaver has been very successful in raising community awareness about the dangers of motor vehicle collisions at grade crossings. However, there may be a need to adjust the messages OLI delivers to better address the issues and concerns of people who may intend to harm themselves and to perhaps expand their efforts to address intentional fatalities. A detailed discussion of this topic is beyond the scope of this project. However, there is concern about whether the messages and information OLI conveys to some groups may also be problematic for those wishing to intentionally harm themselves. Perhaps railroads must take a more proactive public health advocacy role from the point of view of safety and health, as well as educating the public about railroad safety. The bottom line is that both railroads and the public must understand that railroads are not inherently unsafe and that they require a high degree of vigilance and situational awareness to be traversed safely.

II. CONCLUSION

Railway suicides occur with some degree of regularity on most commuter railroads. While the overall number of suicides on the entire US rail system is not large, it is of concern to transit agencies and the community. Suicides represent a small but noticeable portion of the overall number of suicides in a given geographic locale. People likely to be at risk for dying by suicide are highly likely to be male, under 50 years of age, have some form of depression or mental disorder, have been involved with drugs and alcohol, may live in close proximity to the railroad, and may have been unemployed or dealing with financial stressors. Employee training programs can be effective in improving knowledge of the signs, symptoms, and risk factors for suicide. In addition, employee training programs increase self-confidence and self-efficacy for dealing with people who intend to engage in intentional self-harm using the railway system. However, evidence of the overall effectiveness of these programs for reducing suicides remains unavailable.⁷⁶ Reporting trespasser suicides in the FRA database will provide additional data necessary to examine these questions. However, small numbers in specific locations or geographic areas may still be unlikely to reveal the long-term effects of training due to small sample sizes, which affect statistical power and the ability to draw conclusions. Community members report a high degree of concern for suicide and also endorse items that reflect a sense of responsibility for addressing the problems. However, community members also report low degrees of confidence regarding how to help with these problems. Lastly, suicide is a result of individual mental health, life events, and life stressors, and the fluctuations in societal and economic forces. In addition, results of this study suggest that prevention and awareness efforts might be more efficiently targeted toward specific groups identified by locations, gender, and age. Suicide is not just a railroad problem, but it is a larger public health concern as well. Railroads may wish to broaden their activity within local communities to educate the public on these issues and become a positive force for addressing these public health concerns through community involvement and organization on a broader scale. A possible expansion of the role of Operation Lifesaver may be one way of addressing these issues. Continued research using a larger-scale database and reporting system will lead to more significant insights into the means for addressing this issue over time.

III. RECOMMENDATIONS

Recommendation 1

This study suggests the need for ongoing and continuing training of railroad employees regarding warning signs and risk factors for suicide. Training will increase awareness and self-efficacy for assisting those in need.

Recommendation 2

Suicide awareness-training programs should set clear boundaries and guidelines for railroad employees regarding their responsibility and what is expected and not expected in specific roles. People who have immediate customer-facing roles are likely to be expected to have more responsibility to assist or intervene.

Recommendation 3

Different groups of individuals will use the railroad as a means of intentional self-harm and thus will need to have different types of educational interventions.

Recommendation 4

Barriers are needed but not sufficient, as some individuals who are intent upon self-harm will circumvent the barriers.

Recommendation 5

Community identification, consultation, and engagement with people who live and reside in the immediate area who are dealing with alcohol and substance abuse or some form of mental disorder would likely be of value.

Recommendation 6

Anticipate increases in numbers of suicides when economic conditions are poor, and develop more aggressive outreach programs.

Recommendation 7

Community members and organizations should be encouraged to take a more active role in suicide prevention.

Recommendation 8

Suicide prevention efforts must be targeted in and around the immediate area of the railroad stations or platforms and also along railroad tracks in general because there are few identifiable “hotspots.” Perhaps more monitoring of the tracks using remote sensing, motion detectors, and video feeds would be helpful.

Recommendation 9

It would be helpful to develop a more aggressive general community engagement effort in high-risk areas near the railroad.

Recommendation 10

The efforts of Operation Lifesaver (OLS) must be commended but expanded. The OLS personnel could also increase their discussion about the possibility of suicide, intoxication, and other forms of mental illness.

APPENDIX 1. PRE-POST TRAINING QUESTIONNAIRE

Circle the number that corresponds to the degree that you agree with the statement.

1	2	3	4	5
Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
To what extent do you agree/disagree with the following...				
1. It is a sign of personal weakness to receive treatment for suicide.				1 2 3 4 5
2. Many people who talk about suicide just want attention.				1 2 3 4 5
3. Suicide prevention is not my responsibility.				1 2 3 4 5
4. Asking if someone is thinking about suicide may give them the idea to try it.				1 2 3 4 5
5. If someone wants to kill themselves there isn't much we can do to stop them.				1 2 3 4 5
6. People often attempt suicide without warning and out of the blue.				1 2 3 4 5
7. You should not intervene with a person who might be suicidal unless you are sure the person is serious about suicide.				1 2 3 4 5
8. Suicide is preventable.				1 2 3 4 5
9. Suicide prevention is a community responsibility.				1 2 3 4 5
10. I would ask someone who was exhibiting the warning signs of suicide if they are thinking about suicide.				1 2 3 4 5
11. I know who to call for help if I feel suicidal or know of someone who is.				1 2 3 4 5
12. I feel confident that I can help, in some small way, prevent suicide.				1 2 3 4 5
13. I feel prepared to recognize the signs of a person at risk of suicide.				1 2 3 4 5
14. I feel confident in my ability to help someone at risk of suicide.				1 2 3 4 5
Please circle <i>True</i> or <i>False</i> for the following questions				
15. Talking to someone about suicide will make them more likely to do it.				True False
16. People who use alcohol or drugs are at a greater risk for suicide.				True False
17. If people are serious about committing suicide they don't tell anyone.				True False
18. Leaving personal belongings on the train platform is a sign that someone may be considering suicide.				True False
19. Erratic behavior is an indicator of potential suicide risk.				True False
20. Which of the following describes you? Please circle all that apply				
a. A close personal friend or relative died by suicide				Yes No
b. An acquaintance died by suicide				Yes No
c. A person I know of, through work or school, died by suicide				Yes No
d. I know someone who was injured/killed on a railroad due to a suicide attempt				Yes No
e. I have not known anyone who died by suicide				Yes No
Age:		Race:		
Gender:		Occupation: Have you worked for a RAILROAD? Yes No		
Education:		City of Residence:		

APPENDIX 2. COMMUNITY ATTITUDES QUESTIONNAIRE

Circle the number that corresponds to the degree that you agree with the statement.

1	2	3	4	5
Strongly disagree	Disagree	Neither	Agree	Strongly agree

To what extent do you agree/disagree with the following...	
1. It is a sign of personal weakness to receive treatment for suicide.	1-5
2. Many people who talk about suicide just want attention.	1-5
3. Suicide prevention is not my responsibility.	1-5
4. Asking if someone is thinking about suicide may give them the idea.	1-5
5. If someone wants to kill them self there isn't much we can do to stop them.	1-5
6. People often attempt suicide without warning and out of the blue.	1-5
7. You should not intervene with a person who might be suicidal unless you are sure the person is serious about suicide.	1-5
8. Suicide is preventable.	1-5
9. Suicide prevention is a community responsibility.	1-5
10. I would ask someone who was exhibiting the warning signs of suicide if they are thinking about suicide.	1-5
11. I know who to call for help if I feel suicidal or know of someone who is.	1-5
12. I feel confident that I can help, in some small way, prevent suicide.	1-5
13. I feel prepared to recognize the signs of a person at risk of suicide.	1-5
14. I feel confident in my ability to help someone at risk of suicide.	1-5
Please circle <i>True</i> or <i>False</i> for the following questions	
15. Talking to someone about suicide will make them more likely to do it.	T/F
16. People who use alcohol or drugs are at a greater risk for suicide.	T/F
17. If people are serious about committing suicide they don't tell anyone.	T/F
18. Leaving personal belongings on the train platform is a sign that someone may be considering suicide.	T/F
19. Erratic behavior is an indicator of potential suicide risk.	T/F
20. Which of the following describes you? Please circle all that apply	
a. A close personal friend or relative died by suicide	Yes/No
b. An acquaintance died by suicide	Yes/No
c. A person I knew of, through work or school, died by suicide	Yes/No
d. I know someone who was injured/killed on a railroad due to a suicide attempt	Yes/No
e. I have not known anyone who died by suicide	Yes/No

Age:	Race:
Gender:	Occupation:
	Have you worked for a RAILROAD? Yes/No
Education:	City of Residence:

APPENDIX 3. SUICIDE PREVENTION PROGRAM FOR TRANSIT INDUSTRY

Overview of Training Theory

Mesosystem

- Like the CONNECT model, our program will operate at the meso level, connecting and training the various microsystems.
- Through training, individuals will gain information about mental health referrals available in their community.

Exosystem

- Target local policies, media, and social service agencies to influence the macro-system (ideologies, culture attitudes, stigma).

Macrosystem

- Reduction of stigma, increased awareness of suicide, and prevention on a macro level.

Program Goals

1. Increase Awareness
2. Reduce Stigma
3. Engage Community
4. Improve Identification/Surveillance
5. Enhance Employees' Self-efficacy
6. Prevent Premature Deaths/Suicides

Suicide Prevention Gatekeeper Training

- **Six Modules:** Training occurs in modules 1-4
- **Awareness:** Of suicide and reduction of stigma
- **Identification:** Of risk factors associated with suicide and people at risk
- **Intervention:** Ask, Intervene, Refer

- **Review:** Of policies and procedures
- **Support/Leadership**
- **Postvention**

Awareness

Facilitated through short video, discussion, handouts

Increase Awareness about the Problem of Suicide

- Discuss statistics about suicide on the railways
- Discuss the role of gatekeepers

Stigma Reduction

- Watch a short video to generate awareness and discuss reactions
- Normalize suicidal feelings

Improve Attitudes Related to Suicide

- Facilitate open discussion about suicide, feelings, experiences, etc.
- Understanding how attitudes related to suicide affect intervention

Enhance Knowledge About Suicide

- Discuss and debunk common myths about suicide
- Suicide is preventable

Identification

Facilitated through lecture and group discussion

- Importance of Early Identification
- Identification of Protective Factors
- Identification of Risk Factors
- Identification of Warning Signs

-
- Talking about suicide, intoxication, giving items away, leaving things on the platform, standing close to the edge of the platform, erratic behaviors
 - Using Intuition
 - Gut feeling, fear, hunch

Intervention: AIR

The key steps and procedures for addressing a potentially suicidal individual will be reviewed, discussed, demonstrated, and practiced using case examples, role play, small group discussions, and video clips.

Ask

- Learn to begin a dialogue with a potentially suicidal person
- Learn to ask direct questions about suicide

Intervene

- Reduce risk factors and increase protective factors (restore hope, decrease isolation, and increase social support while removing the means of suicide)
- Learn how to speak with a potentially suicidal individual
- Remaining calm, empathetic responding, engagement, active listening

Refer

- Procedure for referral process will be highlighted – contacting manager, escorting to safe area. Community resources will be provided

Review of Policy and Procedures

Facilitated through lecture and discussion

Review of Organizational Procedures

- Referral process
- Identify on-duty contact person if suicidal individual is identified
- Follow-up for staff members who encounter suicidal individuals
- Ways to ensure safety of patrons

- Escorting a suicidal individual to a safe place

Education about Community Resources

- Educate participants about community resources, link participants to professionals and programs, and discuss referral process

Community Support/Leadership

Make suicide prevention a community effort

- Engage local mental health agencies: education about railway suicide and what we know about individuals who commit suicide by train
- Partner with community organizations to increase awareness
- Taskforce of key stakeholders
- Work with local media
- Top-level support from railroad
- Hierarchy of messages
- Executives send messages to senior leaders, to managers, to front-line employees, with information about program and importance of program (emails, newsletters, etc.). This keeps program relevant and motivates staff.
- Active support from top-level executives increases program awareness
- Incorporate suicide awareness into ongoing training

Postvention

- Efforts to treat deaths by suicide as they occur so future suicides may be prevented

Reducing the Risk of Suicide Related Phenomena

- Talking with the media
- Contagion and copycats

Guidelines on Reporting of Suicides

- Not glorifying the death or describing the means by which suicide victims ended their lives

Support for Employees

- Consulting local mental health providers

Program Evaluation: Theory of Change Model

Participants will complete a pre- and post-test measuring domains 1–4

- Stigma
- Knowledge
- Attitudes
- Self-efficacy
- Partnerships/key stakeholders
- Reduction of premature deaths/suicide rate

APPENDIX 4. FRA TRESPASSER DEATHS REPORT

2.07 - Trespasser Casualties(Deaths)

**TRESPASSER DEATHS (BY CALENDAR YEAR, Jan-Dec) -
(EXCLUDES HIGHWAY-RAIL INCIDENTS)**

Fatalities Only Calendar Year – 2015 End Month of Report - August

	Total		Total Year Counts			YTD Counts Jan -Aug		% Change Over Time		
	Cases	Pct of Total	2012	2013	2014	2014	2015	2012 to 2014	2013 to 2014	To Aug 2014 2015
GRAND TOTAL....	1,664	100.0	412	427	482	317	343	17.0	12.9	8.2
California	297	17.8	69	66	92	57	70	33.3	39.4	22.8
Texas	119	7.2	31	25	42	28	21	35.5	68.0	-25.0
Pennsylvania	91	5.5	30	18	26	18	17	-13.3	44.4	-5.6
Florida	88	5.3	17	23	27	20	21	58.8	17.4	5.0
Illinois	77	4.6	15	20	27	16	15	80.0	35.0	-6.3
New York	74	4.4	22	15	19	14	18	-13.6	26.7	28.6
North Carolina	65	3.9	16	17	20	12	12	25.0	17.6	.
Ohio	58	3.5	14	21	12	11	11	-14.3	-42.9	.
Georgia	57	3.4	14	14	19	14	10	35.7	35.7	-28.6
New Jersey	48	2.9	4	14	16	11	14	300.0	14.3	27.3
Indiana	45	2.7	11	16	9	4	9	-18.2	-43.8	125.0
Washington	41	2.5	11	12	8	3	10	-27.3	-33.3	233.3
Alabama	36	2.2	9	13	6	3	8	-33.3	-53.8	166.7
Kentucky	36	2.2	12	8	8	4	8	-33.3	.	100.0
Tennessee	35	2.1	10	5	9	5	11	-10.0	80.0	120.0
Massachusetts	31	1.9	12	6	9	5	4	-25.0	50.0	-20.0
Virginia	30	1.8	6	9	8	4	7	33.3	-11.1	75.0
Maryland	28	1.7	5	8	9	7	6	80.0	12.5	-14.3
Arizona	27	1.6	8	6	7	4	6	-12.5	16.7	50.0
Louisiana	26	1.6	7	7	7	6	5	.	.	-16.7
Oregon	26	1.6	10	5	8	5	3	-20.0	60.0	-40.0
West Virginia	25	1.5	7	10	6	6	2	-14.3	-40.0	-66.7
Michigan	23	1.4	11	6	3	1	3	-72.7	-50.0	200.0
Mississippi	23	1.4	6	6	7	4	4	16.7	16.7	.
Missouri	23	1.4	6	4	7	5	6	16.7	75.0	20.0
Oklahoma	23	1.4	3	7	5	4	8	66.7	-28.6	100.0
South Carolina	22	1.3	4	10	4	1	4	.	-60.0	300.0
Kansas	19	1.1	4	5	6	5	4	50.0	20.0	-20.0
New Mexico	18	1.1	1	11	5	5	1	400.0	-54.5	-80.0
Minnesota	17	1.0	8	5	4	3	.	-50.0	-20.0	.
Arkansas	15	0.9	2	5	5	5	3	150.0	.	-40.0
Colorado	15	0.9	2	4	5	3	4	150.0	25.0	33.3
Connecticut	15	0.9	3	2	8	3	2	166.7	300.0	-33.3
Wisconsin	14	0.8	1	4	4	3	5	300.0	.	66.7
Nevada	12	0.7	2	2	6	4	2	200.0	200.0	-50.0
Iowa	11	0.7	1	6	2	1	2	100.0	-66.7	100.0
North Dakota	8	0.5	4	2	2	2	.	-50.0	.	.
Utah	8	0.5	2	3	2	1	1	.	-33.3	.
Nebraska	7	0.4	4	1	2	2	.	-50.0	100.0	.
Wyoming	6	0.4	3	.	2	1	1	-33.3	.	.
Idaho	5	0.3	1	2	.	.	2	.	.	.
Maine	5	0.3	1	1	3	3	.	200.0	200.0	.

	Total		Total Year Counts			YTD Counts Jan -Aug		% Change Over Time		
	Cases	Pct of Total	2012	2013	2014	2014	2015	2012 to 2014	2013 to 2014	To Aug 2014 2015
Montana	5	0.3	2	1	2	2	.	.	100.0	.
Vermont	4	0.2	.	2	1	.	1	.	-50.0	.
Delaware	2	0.1	.	.	1	1	1	.	.	.
New Hampshire	2	0.1	.	.	2	1	.	.	.	.
Dist Of Columbi	1	0.1	.	.	.	.	1	.	.	.
Rhode Island	1	0.1	1	.	.	.	.	.	.	.

TRESPASSER DEATHS (BY CALENDAR YEAR, Jan-Dec)
(EXCLUDES HIGHWAY-RAIL INCIDENTS)

Selections: Railroad - All Railroads
State - All States County - All Counties
All Regions
Fatalities Only
Calendar Year - 2015
End Month of Report - August

Age	Total		Total Year Counts			YTD Counts Jan - Aug		% Change Over Time		
	Cases	Pct	2012	2013	2014	2014	2015	2012 to 2014	2014 to 2015	to Aug 2014 2015
Total...	1,664	100.0	412	427	482	317	343	17.0	12.9	8.2
01 - 05	5	0.3	1	.	3	.	1	200.0	.	.
06 - 10	8	0.5	2	.	2	2	4	.	.	100.0
11 - 15	46	2.8	19	11	8	7	8	-57.9	-27.3	14.3
16 - 20	168	10.1	42	49	42	30	35	.	-14.3	16.7
21 - 25	184	11.1	43	48	56	39	37	30.2	16.7	-5.1
26 - 30	170	10.2	41	45	41	24	43	.	-8.9	79.2
31 - 35	142	8.5	40	38	37	23	27	-7.5	-2.6	17.4
36 - 40	136	8.2	24	30	54	37	28	125.0	80.0	-24.3
41 - 45	113	6.8	26	24	46	31	17	76.9	91.7	-45.2
46 - 50	158	9.5	39	42	41	29	36	5.1	-2.4	24.1
51 - 55	136	8.2	35	45	36	21	20	2.9	-20.0	-4.8
56 - 60	100	6.0	19	32	33	23	16	73.7	3.1	-30.4
61 - 65	63	3.8	19	13	12	8	19	-36.8	-7.7	137.5
61 - 70	24	1.4	10	6	7	5	1	-30.0	16.7	-80.0
71 - 75	17	1.0	3	4	6	6	4	100.0	50.0	-33.3
76 - 80	11	0.7	4	3	2	1	2	-50.0	-33.3	100.0
>= 81	10	0.6	5	2	1	1	2	-80.0	-50.0	100.0
Not Given	173	10.4	40	35	55	30	43	37.5	57.1	43.3



Federal Railroad Administration
Office of Safety Analysis

4.11 - Suicide Casualties By State/Railroad

2012

Selections: Railroad - ALL / State - ALL

Time Frame - From 2012 To 2014

Month	Fatalities	Injuries
January	14	2
February	10	8
March	25	3
April	27	4
May	27	5
June	30	6
July	24	3
August	26	4
September	23	1
October	25	2
November	19	4
December	16	3
All	266	45

2013

Selections: Railroad - ALL / State - ALL

Time Frame - From 2012 To 2014

Month	Fatalities	Injuries
January	24	3
February	23	1
March	36	2
April	25	1
May	31	2
June	34	3
July	32	3
August	25	5
September	27	2
October	19	1
November	19	1
December	15	2
All	310	26

2014

Selections: Railroad - ALL / State - ALL

Time Frame - From 2012 To 2014

Month	Fatalities	Injuries
January	13	2
February	12	1
March	23	6
April	25	4
May	24	2
June	22	3
July	24	5
August	25	2
September	18	4
October	26	0
November	20	5
December	19	5
All	251	39

ENDNOTES

1. <http://www.who.int/topics/suicide/en/>
2. <http://0-www.annualreviews.org.bianca.penlib.du.edu/doi/pdf/10.1146/annurev-publhealth-031811-124636>
3. Ibid.
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ABOUT THE AUTHOR

Professor Patrick Sherry, Ph.D., A.B.P.P., was director of counseling services at the State University of New York at Buffalo from 1980 to 1985. In 1985, he joined the University of Denver Counseling Psychology Program as an assistant professor of Counseling Psychology. Soon after, he was appointed director of training for the Doctoral Program in Counseling Psychology, which was approved and accredited by the American Psychological Association in 1987. He was responsible for training doctoral-level psychologists for over 25 years. For the past several years, he has been engaged primarily in consultation, research, and writing in the US and Asia.

Since joining the University of Denver, he has supervised and trained over 500 masters-level counselors and over 200 doctoral-level psychologists in psychotherapy and psychological testing. In addition, he has delivered over 180 scientific presentations and papers at various academic conferences and meetings, and published in more than forty academic publications and peer-reviewed journals.

Dr. Sherry specializes in workplace violence and PTSD for employees involved in critical incidents at work. He has studied the effects of critical incidents on substance abuse, sleep, and fatigue and job performance. In addition, he works with business and industry developing effective interventions and responses to the aftereffects of such events in the workplace. Since 2002, he has been director of the National Center for Intermodal Transportation and a member of the board of directors of the Intermodal Transportation Institute at the University of Denver. In addition to scientific research, he has consulted extensively with Fortune 500 transportation companies throughout the US and Canada in the areas of safety, safety culture assessment, intermodal workforce development in transportation, and leadership training. He also supervises research in intermodal container tracking and security, identifying appropriate work schedules that limit or reduce fatigue and increase performance, identifying workers with high-risk safety profiles, and training and developing executives in intermodal and logistics transportation. Formerly, Dr. Sherry led several pioneering efforts with US railroads to implement behaviorally based safety and peer feedback programs that resulted in significant reductions in reported injuries.

Dr. Sherry is licensed as a psychologist in New York and Colorado. He is listed in the US National Register of Health Service Providers. He was appointed as a Fellow of the Academy of Counseling Psychology and holds diplomat status with the Academy.

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Peninsula Corridor Joint Powers Board (Caltrain)

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Michael Melaniphy (Ex-Officio)
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Abbas Mohaddes (TE 2018)
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Jeff Morales (TE 2016)
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Dean, College of Business
San José State University

Beverley Swaim-Staley (TE 2016)
President
Union Station Redevelopment Corporation

Michael Townes* (TE 2017)
Senior Vice President
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Bud Wright (Ex-Officio)
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Edward Wytkind (Ex-Officio)
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Transportation Trades Dept., AFL-CIO

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Funded by U.S. Department of
Transportation and California
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