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of Transportation
Federal Railroad
Administration

Office of Research,
Development and Technology
Washington, DC 20590

Law Enforcement Strategies for Reducing Trespassing – Pilot Program



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14. ABSTRACT The U.S. Department of Transportation (DOT) John A. Volpe National Transportation Systems Center, under the direction of the U.S. DOT's Federal Railroad Administration, Office of Research, Development, and Technology, evaluated the impacts of a program for four law enforcement agencies to perform trespassing enforcement activities on railroad rights-of-way (ROW). In all the communities, the project allowed law enforcement agencies to dedicate resources to rail trespassing enforcement. Most communities saw a decrease in the number of trespassers encountered per patrol as proceeded, indicating a positive reduction in the number of trespassers along the ROW. Some communities reported other benefits to the program such as supporting the enforcement of other illegal activity and gaining a better understanding of trespassing frequency.					
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METRIC/ENGLISH CONVERSION FACTORS

ENGLISH TO METRIC

LENGTH (APPROXIMATE)

1 inch (in) = 2.5 centimeters (cm)
 1 foot (ft) = 30 centimeters (cm)
 1 yard (yd) = 0.9 meter (m)
 1 mile (mi) = 1.6 kilometers (km)

AREA (APPROXIMATE)

1 square inch (sq in, in²) = 6.5 square centimeters (cm²)
 1 square foot (sq ft, ft²) = 0.09 square meter (m²)
 1 square yard (sq yd, yd²) = 0.8 square meter (m²)
 1 square mile (sq mi, mi²) = 2.6 square kilometers (km²)
 1 acre = 0.4 hectare (he) = 4,000 square meters (m²)

MASS - WEIGHT (APPROXIMATE)

1 ounce (oz) = 28 grams (gm)
 1 pound (lb) = 0.45 kilogram (kg)
 1 short ton = 2,000 pounds (lb) = 0.9 tonne (t)

VOLUME (APPROXIMATE)

1 teaspoon (tsp) = 5 milliliters (ml)
 1 tablespoon (tbsp) = 15 milliliters (ml)
 1 fluid ounce (fl oz) = 30 milliliters (ml)
 1 cup (c) = 0.24 liter (l)
 1 pint (pt) = 0.47 liter (l)
 1 quart (qt) = 0.96 liter (l)
 1 gallon (gal) = 3.8 liters (l)
 1 cubic foot (cu ft, ft³) = 0.03 cubic meter (m³)
 1 cubic yard (cu yd, yd³) = 0.76 cubic meter (m³)

TEMPERATURE (EXACT)

$$[(x-32)(5/9)] \text{ } ^\circ\text{F} = y \text{ } ^\circ\text{C}$$

METRIC TO ENGLISH

LENGTH (APPROXIMATE)

1 millimeter (mm) = 0.04 inch (in)
 1 centimeter (cm) = 0.4 inch (in)
 1 meter (m) = 3.3 feet (ft)
 1 meter (m) = 1.1 yards (yd)
 1 kilometer (km) = 0.6 mile (mi)

AREA (APPROXIMATE)

1 square centimeter (cm²) = 0.16 square inch (sq in, in²)
 1 square meter (m²) = 1.2 square yards (sq yd, yd²)
 1 square kilometer (km²) = 0.4 square mile (sq mi, mi²)
 10,000 square meters (m²) = 1 hectare (ha) = 2.5 acres

MASS - WEIGHT (APPROXIMATE)

1 gram (gm) = 0.036 ounce (oz)
 1 kilogram (kg) = 2.2 pounds (lb)
 1 tonne (t) = 1,000 kilograms (kg)
 = 1.1 short tons

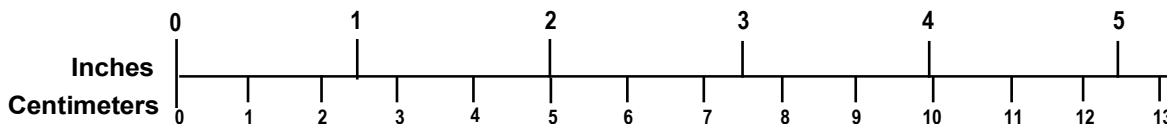
VOLUME (APPROXIMATE)

1 milliliter (ml) = 0.03 fluid ounce (fl oz)
 1 liter (l) = 2.1 pints (pt)
 1 liter (l) = 1.06 quarts (qt)
 1 liter (l) = 0.26 gallon (gal)
 1 cubic meter (m³) = 36 cubic feet (cu ft, ft³)
 1 cubic meter (m³) = 1.3 cubic yards (cu yd, yd³)

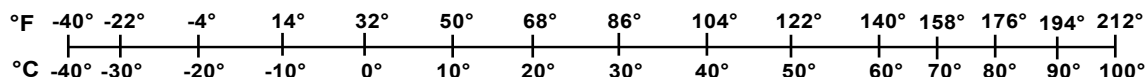
TEMPERATURE (EXACT)

$$[(9/5) y + 32] \text{ } ^\circ\text{C} = x \text{ } ^\circ\text{F}$$

QUICK INCH - CENTIMETER LENGTH CONVERSION



QUICK FAHRENHEIT - CELSIUS TEMPERATURE CONVERSION



For more exact and or other conversion factors, see NIST Miscellaneous Publication 286, Units of Weights and Measures. Price \$2.50 SD Catalog No. C13 10286

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Cover photo is of rail trespass activity at the Cambridge St. overpass in Worcester, Massachusetts. (source: Volpe Center)

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Executive Summary

The Federal Railroad Administration (FRA) Office of Research, Development, and Technology partnered with the John A. Volpe National Transportation Systems Center (Volpe Center) to evaluate a program for law enforcement agencies to perform trespassing enforcement on railroad rights-of-way (ROW). The result was the 2018 Law Enforcement Strategies for Reducing Trespassing pilot program. Its objective was for communities with identified railroad trespassing problems to perform rail trespassing enforcement activities and report them to FRA.

Four communities participated:

- City of Lake Worth, Florida (Palm Beach County)
- City of Worcester, Massachusetts
- City of North Tonawanda, New York
- Town of Brighton, New York

These communities conducted rail trespasser enforcement efforts from May through November 2019. Each reported its activities and encounters with trespassers to FRA. Across the four communities, 510 trespassers were reported during the patrols. The officers issued 231 warnings and 123 citations; 115 trespassers were arrested.

In all the communities, the program allowed law enforcement to dedicate resources to rail trespassing enforcement. They were able to increase, often dramatically, the number of trespassers removed from ROWs before an accident or incident could occur. In Lake Worth, Worcester, and Brighton, the number of trespassers encountered during each patrol decreased over the grant performance period, indicating a decrease in rail trespassing. North Tonawanda saw a decrease from July through September, when the enforcement activities were most consistent. The communities also reported other benefits to the grant activities, including getting a better understanding of the trespass problem in their community and stopping other criminal activities.

1. Introduction

Trespassing on a railroad's private property and along railroad rights-of-way is the leading cause of rail-related fatalities in America. Nationally, approximately 500 rail trespassing deaths occur each year.¹ By definition, trespassers are on railroad property without permission. The Federal Railroad Administration (FRA) Office of Research, Development, and Technology engaged the John A. Volpe National Transportation Systems Center (Volpe Center) to evaluate the impacts of a program for law enforcement agencies to perform trespassing enforcement activities on railroad rights-of-way (ROW).

1.1 Background

In August of 2015, FRA sponsored the Right-Of-Way Fatality and Trespass Prevention Workshop² in Charlotte, North Carolina, to generate ideas on best practices and new and innovative strategies and programs for reducing deaths along ROWs. The workshop included a session on enforcement related efforts. One of the recommendations generated from that session was to “establish a federally funded grant program designed specifically for the enforcement of state, county, or municipal laws relating to railroad trespass violations.”

In response to that identified need, in February 2018, FRA announced the Law Enforcement Strategies for Reducing Trespassing pilot program in the Federal Register.³ It was intended for communities with identified railroad trespassing problems to perform rail trespassing enforcement activities and report them to FRA. The Volpe Center was responsible for collecting data and evaluating the effectiveness of providing funds to local law enforcement in reducing rail trespass-related risks.

1.2 Objective

The objective of this study was to determine the effectiveness of funding local law enforcement agencies for rail trespass prevention activities.

1.3 Overall Approach

Participating communities implemented the program from September 2018 through September 2019, with most activity occurring in the spring and summer months. They provided FRA with baseline rail trespassing data, including past incidents and enforcement activities such as trespass encounters, locations, and demographic information.

The Volpe Center collected this data and analyzed it to determine the impact of the project on reducing rail trespassing-related risks.

¹ <https://safetydata.fra.dot.gov/OfficeofSafety/default.aspx>.

² <https://rosap.ntl.bts.gov/view/dot/37388>.

³ 83 FR 7842, available at <https://www.federalregister.gov/documents/2018/02/22/2018-03579/notice-of-funding-opportunity-for-law-enforcement-strategies-for-reducing-trespassing-pilot-grant>.

1.4 Scope

This project analyzed rail trespassing data for the four selected communities, which self-reported the data to FRA.⁴ The law enforcement agencies performed program-related activities primarily from April 2019 through September 2019.

1.5 Organization of the Report

The organization of this report is as follows:

Section [1](#) – Introduction provides a description of the project and work performed.

Section [2](#) – Participating Communities discusses the communities that received Law Enforcement Strategies for Reducing Trespassing pilot grant funding.

Section [3](#) –Law Enforcement Activity Analysis includes data collected from the communities on rail trespassing and enforcement activities.

Section [4](#) - Conclusion summarizes the study findings.

⁴ <https://cms8.fra.dot.gov/elibrary/fy18-law-enforcement-strategies-grant-program-selected-projects>

2. Participating Communities

FRA awarded the Law Enforcement Strategies for Reducing Trespassing pilot grant to four agencies in four U.S. communities. The size and scope of each award varied, but each community demonstrated a rail trespass problem and a feasible approach to reducing rail trespass risk in its community.

FRA announced program participants in September 2018.⁵

City of Lake Worth, Florida (Palm Beach County)

City of Worcester, Massachusetts

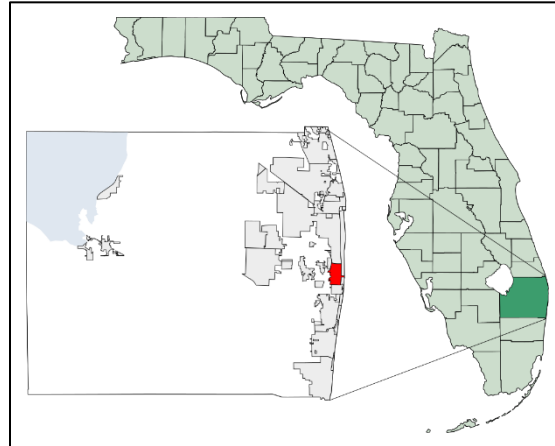
City of North Tonawanda, New York

Town of Brighton, New York

Each community provided FRA with a statement of work and a detailed work plan prior to beginning the trespasser enforcement activities. FRA and the Volpe Center also worked with the awardees to establish data collection measures that would provide necessary information to analyze the grant program's effectiveness.

2.1 Palm Beach County Sheriff's Office – Lake Worth, Florida

The Palm Beach County Sheriff's Office was in charge of rail trespass-related enforcement activities. The project focused on the City of Lake Worth, Florida, located in southern Florida in central Palm Beach County, as shown in [Figure 1](#).



(Source: Wikipedia, [Attribution-Share Alike 3.0 Unported](#))

Figure 1: Location of Lake Worth in Palm Beach County, Florida

The city has a population of over 39,000 and a land area of 5.9 square miles. Nearly one-third of Lake Worth households reside below the poverty level. Homeless camps have been constructed throughout the city, including on or near the railroad ROW.

⁵ <https://cms8.fra.dot.gov/elibrary/fy18-law-enforcement-strategies-grant-program-selected-projects>

2.1.1 Railroads in Lake Worth, Florida

Multiple track rail corridors run north and south through the city. South Florida Regional Transportation Authority (Tri-Rail) operates 3 miles of track and Florida East Coast Railway (FEC) operates another 3 miles of track. There are six grade crossings in the city, all quiet zones.

In January 2018, Brightline passenger trains began operating through the city on the FEC rail line. Previously used by low-speed freight trains, the line now sees 16 trains per day operating at speeds up to 79 mph. This FEC rail line runs directly through the busy downtown center.

The city downtown includes the rail station and a confluence of multiple rail lines. Rail trespassing by both residents and visitors is common in the downtown center due to the proximity of the rail line to these many sites.

There is one rail station in the city that serves approximately 4,500 passengers per day. The station sees 50 Tri-Rail commuter trains and 4 Amtrak trains daily. The station is located directly behind the local high school. Students frequently cross the tracks, and Tri-Rail has received numerous complaints regarding trespassing at or near the station.

2.1.2 Rail Trespass Occurrence

Lake Worth has a demonstrated rail trespass problem. Florida has the third highest rail trespass-related deaths of any State in the country, and Palm Beach County has the second highest among counties in Florida. In 2016, Palm Beach County had eight rail-related deaths.

The Palm Beach County Sheriff's Office provided data on rail trespassing activity in 2017; see [Figure 2](#). The county reported 53 incidents from of trespassing violations and injury/death reports. The Palm Beach County Sheriff's Office stratified the data by day of week and time of day to inform their enforcement patrol schedule. [Figure 3](#) shows the locations of trespass incident in Lake Worth for 2017.

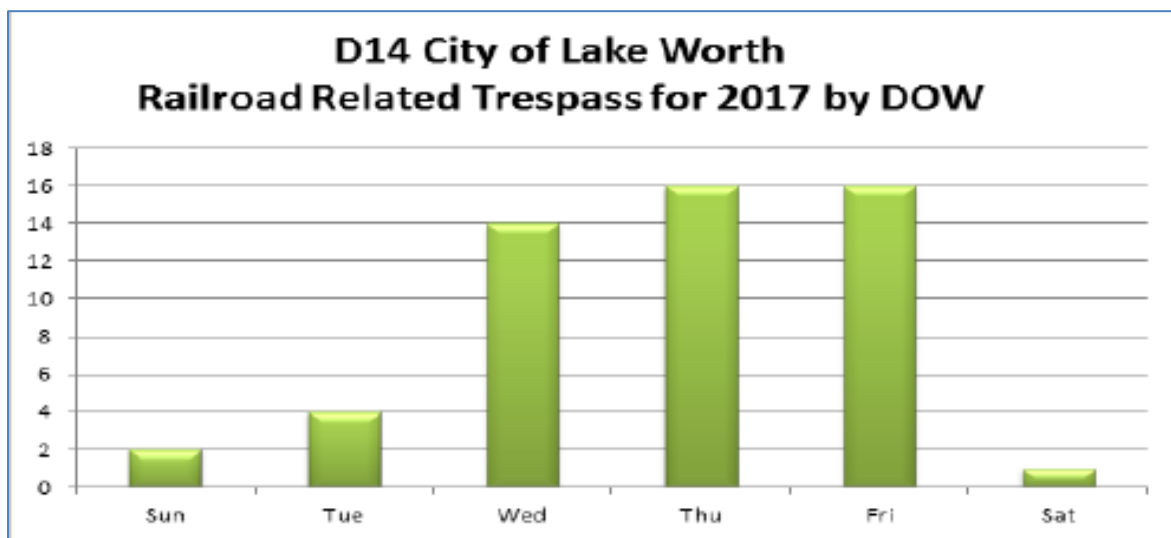


Figure 2: City of Lake Worth Rail Trespass Encounters in 2017 by Day of the Week

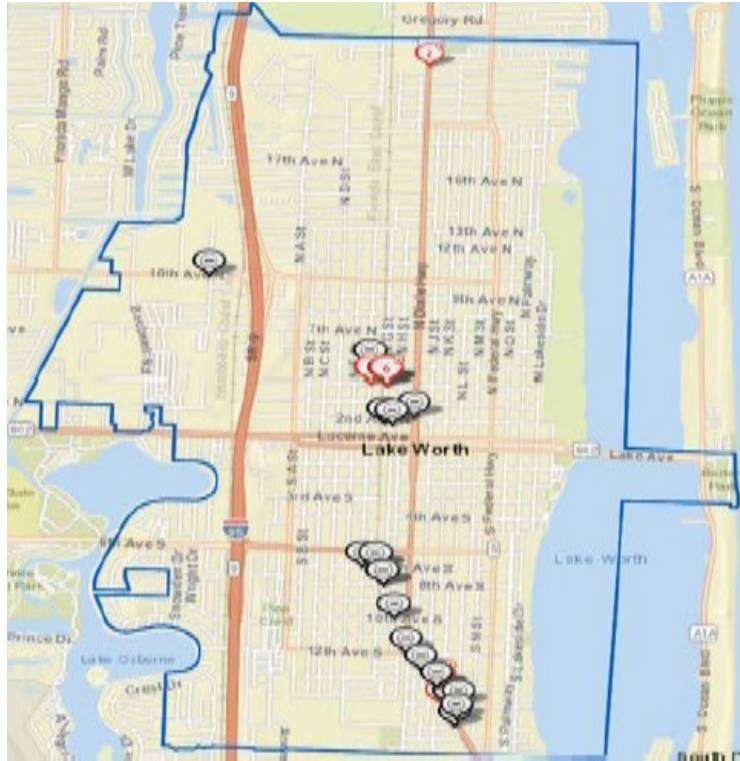


Figure 3: Lake Worth Rail Trespass Incident Locations

2.1.3 Project Plan

The project plan proposed by the Palm Beach County Sheriff’s Office incorporated data collection, community awareness, and targeted enforcement. Its project plan had three objectives, described below.

Objective I: Make data-driven decisions for trespassing enforcement efforts.

The Palm Beach County Sheriff’s Office collected information on trespass violations, injuries, and fatalities and used that information in developing their trespassing enforcement plan. In addition to the violations, injuries, and fatalities, there are many “near misses” and undocumented trespassing that occurs along the rail lines in Lake Worth. To more effectively identify areas that will yield the most safety benefit from the enforcement activities, the Sheriff’s Office proposed to utilize cameras and drone technology to identify “hot spot” trespass areas and “rabbit trails.” The data collected from this technology would be used to guide the implementation of targets and comprehensive enforcement efforts.

Objective II: Provide community awareness of trespassing violations and consequences.

Lake Worth identified risk factors that contribute to rail trespassing activity in the community. These include the proximity of the tracks and station to points of interest and a growing homeless population that use the ROW for encampments and shortcuts. As part of the program activities, the Sheriff’s Office proposed awareness efforts to apprise the public of the Florida laws and legal and safety consequences of rail trespassing. They planned to implement these awareness efforts with signage on or around rail lines.

Objective III: Develop and implement a comprehensive trespass enforcement strategy.

The Sheriff’s Office planned to implement enhanced enforcement efforts along the rail ROW. The locations, days, and times of the enforcement activities would be informed by the data collection efforts in Objective I of the plan. This would yield greater safety benefits by targeting when and where trespassers were entering the rail ROW.

The Sheriff’s Office would train their officers on railway safety and enforcement. The Palm Beach County Sheriff’s Office would partner with the safety and security contractors for the railroads to receive rail training safety courses, training in emergency preparedness, and learn the physical characteristics, operating conditions, and other relevant information about the rail lines to assist in enforcement.

The enforcement plan for Lake Worth included scheduled, targeted enforcement operations. Over the 6-month period of performance, the Sheriff’s Office would schedule 4-hour time blocks, twice a week in which two deputies would patrol the ROW for trespassing violators and issue citations. In addition, the City planned for “trespass wolf packs.” These teams included four community policing and four street team deputies who would also identify trespassers and issue citations, and would also focus on community engagement by trying to educate the trespassers about the legal and safety consequences of unlawfully entering the railroad ROW.

2.2 Worcester, Massachusetts

The City of Worcester, Massachusetts, was in charge of rail trespass-related enforcement activities under the grant. Worcester is the second largest city in Massachusetts and New England. The city has a population of 183,677 residents. [Figure 4](#) shows the location of Worcester in Massachusetts.

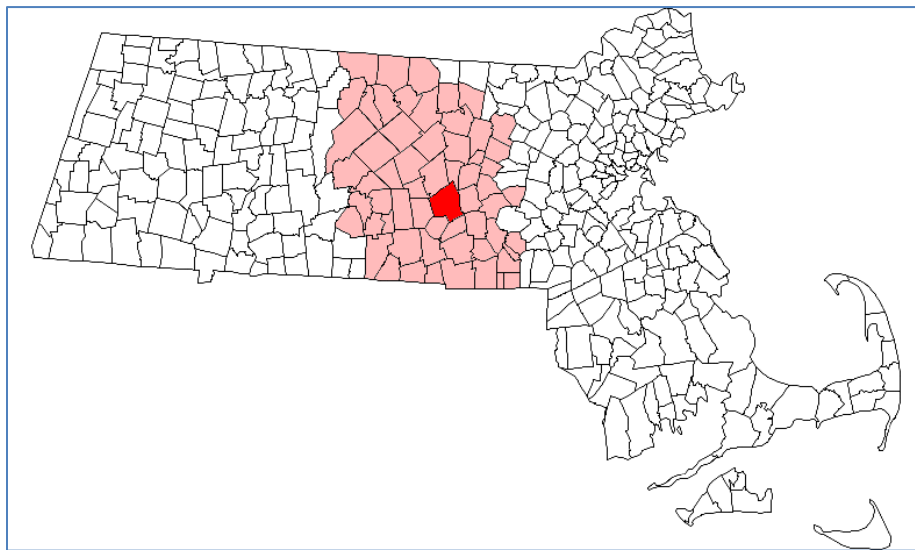


Figure 4: Location of Worcester, Massachusetts

2.2.1 Railroads in Worcester

Worcester's rail transit system hosts passenger service (Boston commuter rail and Amtrak), centered on historic Union Station, and three freight rail hubs moving large amounts of rail and truck traffic to and through the city, including hazardous materials. There is a shared track

corridor running through the city, used by CSX Transportation (CSX) and Amtrak. Amtrak's Lake Shore Limited runs daily through Worcester with east/west passenger travel service between Boston and New York or Boston and Chicago. The 6,665 Amtrak passengers at the Worcester station in 2017 represented an 8 percent increase over the previous year.

The Worcester Police Department (WPD) and the city's Quality of Life Task Force, in conjunction with key stakeholders, identified a 5-mile corridor of track as the target area for this project. The area included five primary sites where known trespasser risks exist:

- Temple Street
- 50 Washington Street
- Hermon Street Bridge
- 44 Hammond Street
- 55 Richards Street

2.2.2 Rail Trespass Occurrence

There were four fatalities from railway trespassing in Worcester County from 2013 to 2018. The Worcester Fire Department responded to three fire calls, and WPD responded to 72 trespass incidents and made a total of 35 trespass arrests in the target area from January 2016 through December 2017. The map in [Figure 5](#) below depicts the target area. At some locations, residents traverse the tracks as a shortcut or pass-through over the tracks, rather than walking a longer distance to reach a gated rail crossing. Trespassers have frequent encounters with moving or stopped trains, and often receive little warning of approaching trains. In addition, illicit activity is present in dark, concealed, or unpatrolled areas along the tracks.

FRA, the City of Worcester, and the Volpe Center conducted a trespass prevention study in 2017–2018. This project identified three target areas to study and create a strategy to address trespassing issues. An implementation plan was developed for each of the three target areas, with the Cambridge Street Bridge at 55 Richards Street as the pilot site.

During a four-month period from late 2017 to early 2018, there were 149 trespassing events involving 231 trespassers at the pilot site location. A total of 184 males and 47 females were observed, and 70 percent of the trespassers were physically on the tracks. The shortest trespass event was 12 seconds, the longest was 4 hours and 18 minutes, and the average trespass event was 15.3 minutes. In light of the evidence, there is an active and ongoing trespass problem in Worcester.

2.2.3 Project Plan

WPD proposed a trespasser enforcement plan with five distinct techniques.

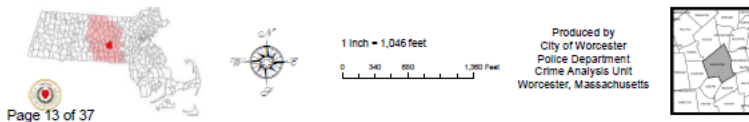
- 1) Increase law enforcement presence through saturation patrols. The additional presence of police officers will help harden targets and control access to facilities. The Worcester grant project consisted of three police officers and one police lieutenant, working on an overtime basis.
- 2) Strengthen formal surveillance by integrating modern technological advancements to ensure that patrols are equipped with the necessary tools.

- 3) Disrupt the markets for illicit behavior and deny the benefits of an unguarded environment.
- 4) Issue tickets and connect high-risk and vulnerable populations with social service/health providers.
- 5) Control illegal activities such as drug use and prostitution.

The Worcester project used data from the previous study to inform the days and times of enforcement patrols. Officers from WPD's Crisis Intervention Team and Neighborhood Response Team patrolled the target area on Wednesday, Thursday and Friday, which accounted for over 58 percent of the trespassing occurrences. [Figure 5](#) shows the target area.

WPD also proposed to integrate a technological solution that would enable a video surveillance feed into the data terminals used during patrols. It would provide a secure platform that conforms to present video surveillance system and information technology (IT) environment. A site license for a video surveillance system will enable the WPD to have on-demand-access to real-time video to maximize data driven responses to trespassing. Utilizing technology as part of the enforcement response would significantly aid in developing leads and identifying suspects. The video surveillance enhances strategic planning with real-time awareness, rapid response, and situational awareness by sharing information on railway trespassing with policymakers.

The WPD's project plan also included the Crisis Intervention Team and Neighborhood Response Team involvement with the Quality of Life Task Force. When encountering individuals affected by homelessness, mental illness, and/or substance use disorders, the Crisis Intervention Team connects them to the appropriate treatment or social service provider to help them find the resources they need. The proposed trespass prevention project will support the present law enforcement strategy to increase safety and effectiveness when responding to citizens with behavioral health challenges, when safe and appropriate to do so.



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Figure 5: Worcester Railroad ROW Trespass Prevention Initiative Target Area

2.3 North Tonawanda, New York

The City of North Tonawanda, with a population of just over 30,000, is located in southeast Niagara County, New York, on the shorelines of the Niagara River and Erie Canal (see [Figure 6](#)).

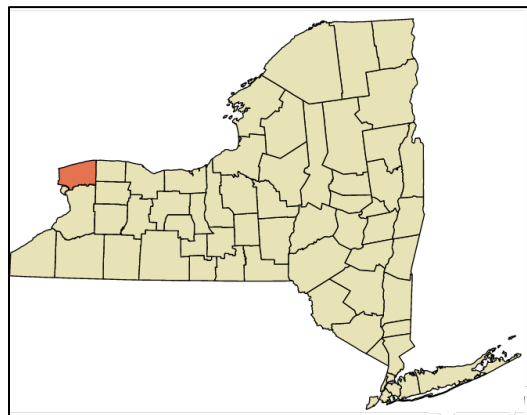


Figure 6: Location of North Tonawanda

2.3.1 Railroads in North Tonawanda

North Tonawanda has 3.25 miles of the Niagara Branch railroad, situated along one of western New York's primary freight and passenger rail lines along the Niagara River. Several freight and passenger trains pass through the city on each day, adjacent to a large concentration of local businesses, residences, and popular waterfront destinations.

CSX employs railroad police officers to enforce the law within its territory under Title 49 U.S. Code § 28101. In the Buffalo-Niagara region, however, just one officer is employed by CSX to enforce the law. This special agent is the sole officer employed with interstate jurisdiction that spans approximately 600 miles of rail line from Pennsylvania to Rochester, New York. Thus, the CSX Railroad Police rely heavily upon the North Tonawanda Police Department as the primary responding agency to accidents and criminal activity. The North Tonawanda Police Department and CSX Railroad Police have a long-standing relationship as sharing information and reports is vital to fulfilling their respective missions.

2.3.2 Rail Trespass Occurrence

Rail trespassing is a common occurrence year-round in North Tonawanda. Six incidents in 2018 resulted in three arrests. Since 2012, the North Tonawanda Police Department responded to 55 incidents on the rail ROW, 32 of which were related to trespassing or vandalism. In 2012, the city experienced a fatality as a result of rail trespassing.

The highest volume of rail trespassing incidents typically occur during warm weather. The city hosts local events and special celebrations, such as the annual Canal Fest each July, drawing tens of thousands of people for the eight-day event. During such events, trespassers are reported on CSX-owned property a near-daily basis. The rail bridge crossing the Erie Canal from North Tonawanda (Niagara County) into Tonawanda (Erie County) is located next to local businesses, restaurants, harbors, and overnight boating docks on either side of the canal and was identified as a hotspot for trespassers. Officers frequently find trespassers under the influence of drugs and/or alcohol.

Per FRA data and CSX reports, the North Tonawanda Police Department determined that potential hotspots for improved law enforcement presence included:

- Witmer Road at the northern jurisdiction boundary
- Ward Road crossing
- Robinson Road and Wheatfield Street – adjacent to numerous residences and local businesses
- Sweeney and East Robinson Streets – adjacent to Erie Canal and CSX rail bridge crossing into Tonawanda

2.3.3 Project Plan

North Tonawanda would implement the trespasser enforcement program for an estimated 50 days over a 6-month period during peak railroad traffic times. The typical schedule would be on weekends (Friday and Saturday evenings), during the summer concert series, and during special events and celebrations (particularly Canal Fest). During each shift, a pair of North Tonawanda Police Officers will actively patrol CSX property and the identified hotspots through a

combination of on-foot patrols or by utility terrain vehicle (UTV). The UTV will provide for a more rapid response in the event of an incident, while ensuring the protection of officers navigating potentially unsafe terrain in dark conditions. The city's policy requires that two officers be present to make an arrest for the safety of both the officers as well as the violating individual(s).

2.4 Brighton, New York

The Town of Brighton is a large community of over 35,000 located near Rochester, New York, in Monroe County (see [Figure 7](#)).

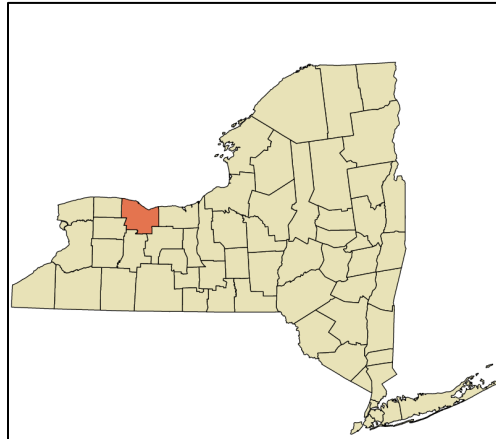


Figure 7: Location of Brighton in Monroe County, New York

2.4.1 Railroads in Brighton

The railroad through Brighton is owned and operated by CSX (see [Figure 8](#)). Amtrak runs on the railway as well, with 1.6 miles of FRA-regulated mainline track.

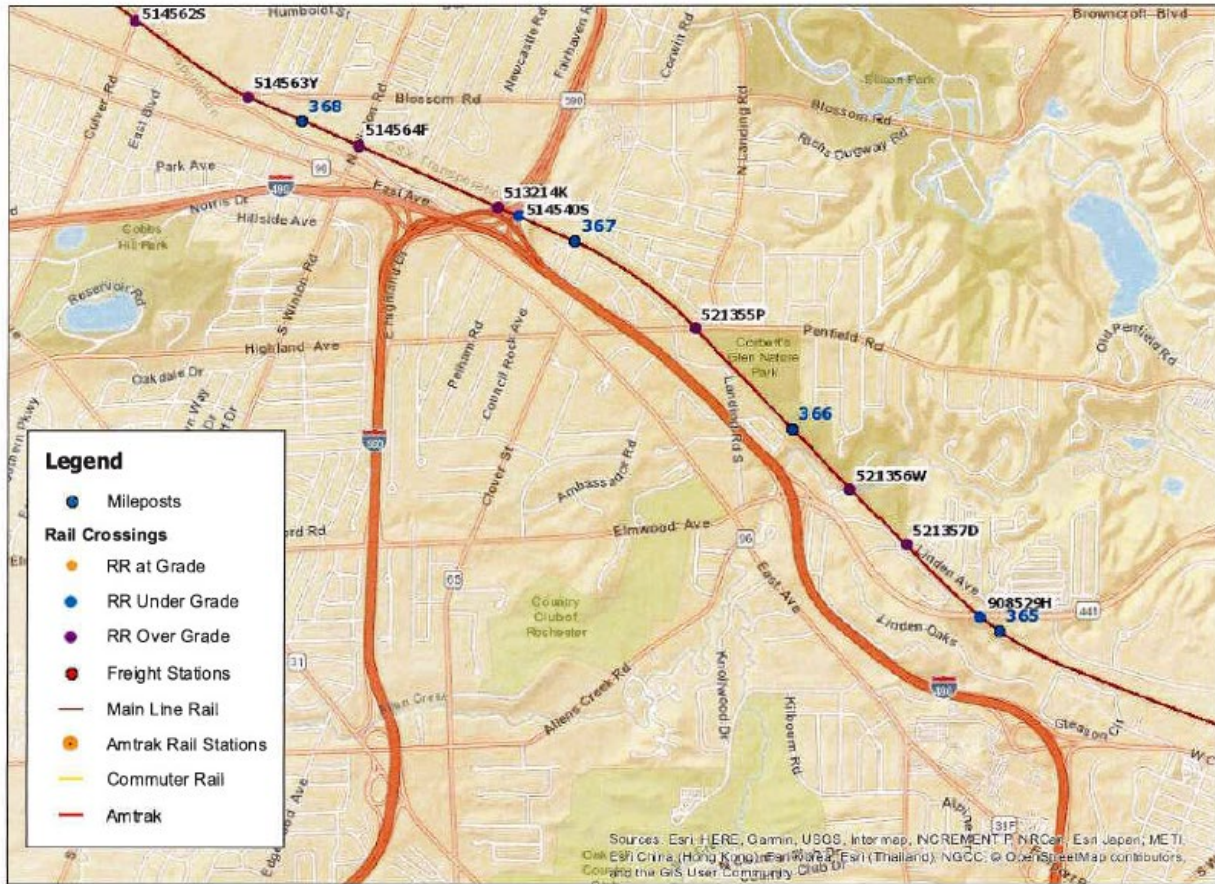


Figure 8: Map of the Rail Line in Brighton

2.4.2 Rail Trespasser Occurrence

Brighton has had two fatal train-pedestrian accidents since 2006: one on March 27, 2015 and another on September 9, 2006. From 2013–2017, the Brighton Police Department handled 96 calls for service relating to pedestrians on or near the tracks. The calls would come in for trespassing, suspicious activity, or a welfare check.

2.4.3 Project Plan

Brighton’s project plan was to put two officers patrolling the railways between mileposts 367 and 365 during the 6-month period of performance. The mileposts are in the area of Cardiff Park and Clover Street at Penhurst Road. This is also the location of the most recent fatality in 2015. Officers would conduct the patrols together during a 4-hour window, 1 day a week, checking the railways in the area and adjacent areas. The times would vary week-to-week from late morning-early afternoon, to late afternoon-early evening. The 8-week project would start on a Sunday and end on a Saturday, moving forward 1 day each week, so that each day of the week is covered once during the length of the project. Toward the end of the project, one of the days would be used by the officers to conduct a PowerPoint presentation for the residents at an independent living facility in the area, the Legacy at Clover Blossom, and at Mercy High School, explaining the dangers of trespassing on the tracks and in the area of the railway.

3. Grant-Funded Law Enforcement Activity Analysis

Each community provided FRA with rail trespass-related enforcement information from before project implementation and then during the project. FRA and the Volpe Center shared recommended data collection fields with each community and worked with the representatives to establish the data collection means that would work for their organization. In general, the communities reported the following data:

- Counts of trespassers encountered
- Counts of arrests, citations or warnings issued
- Trespasser demographic information
- Location information
- Use of drones, cameras or other supplemental enforcement technology

3.1 Palm Beach County Sheriff’s Office – Lake Worth, Florida

The Palm Beach County Sheriff’s Office reported summary information on its enforcement activities as well as additional data on each encounter with a trespasser. The trespass data from before the project was provided with the proposal submission and updated just prior to beginning enforcement activities.

3.1.1 *Trespass Data before Grant Project Implementation*

The Palm Beach County Sheriff’s Office provided data to FRA and the Volpe Center on counts of trespass incidents during 2015, 2016, 2017, and 2018. [Table 3-1](#) shows the total counts per year.

Table 3-1: Lake Worth Annual Counts of Railroad Trespassers

Year	2015	2016	2017	2018 (through 12/6/18)
Count of Trespassers	37	70	66	33

[Figure 9](#) and [Figure 10](#) show the trespasser incidents by time of day and day of the week. The Sheriff’s Office used these data to target its activities.

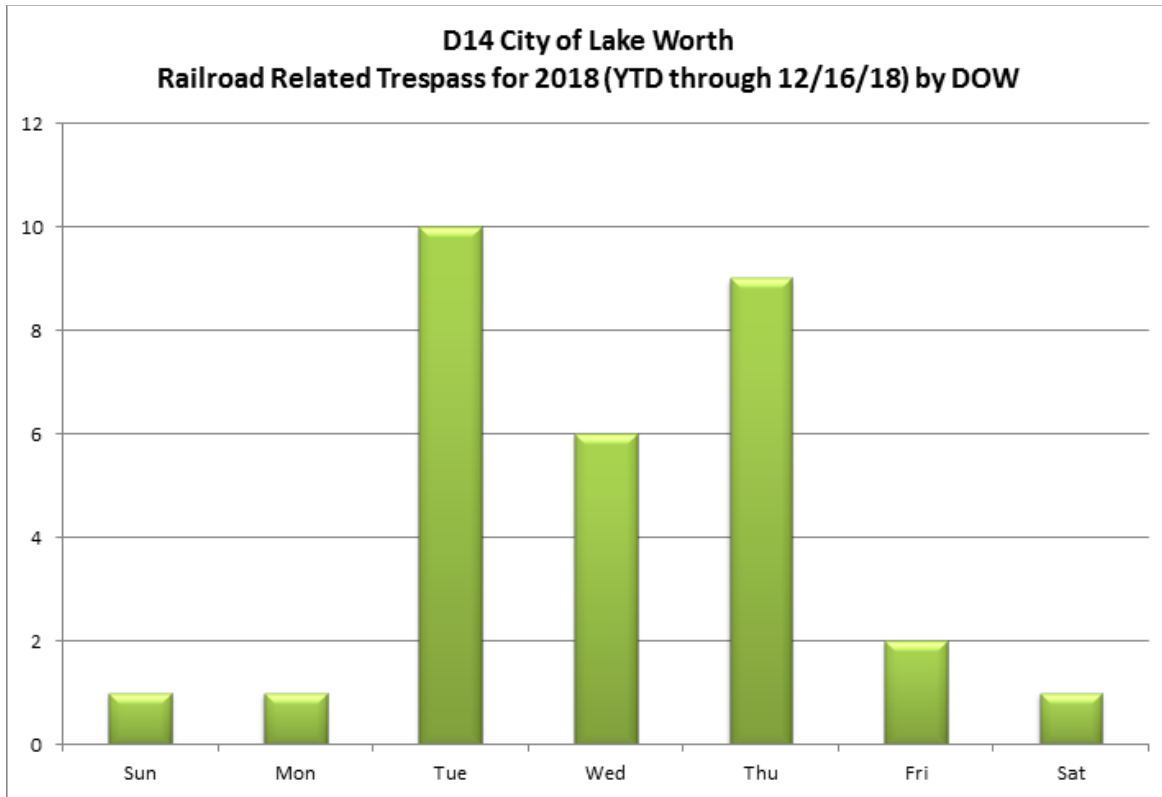


Figure 9: Lake Worth Counts of Rail Trespassers for 2018 by Day of the Week

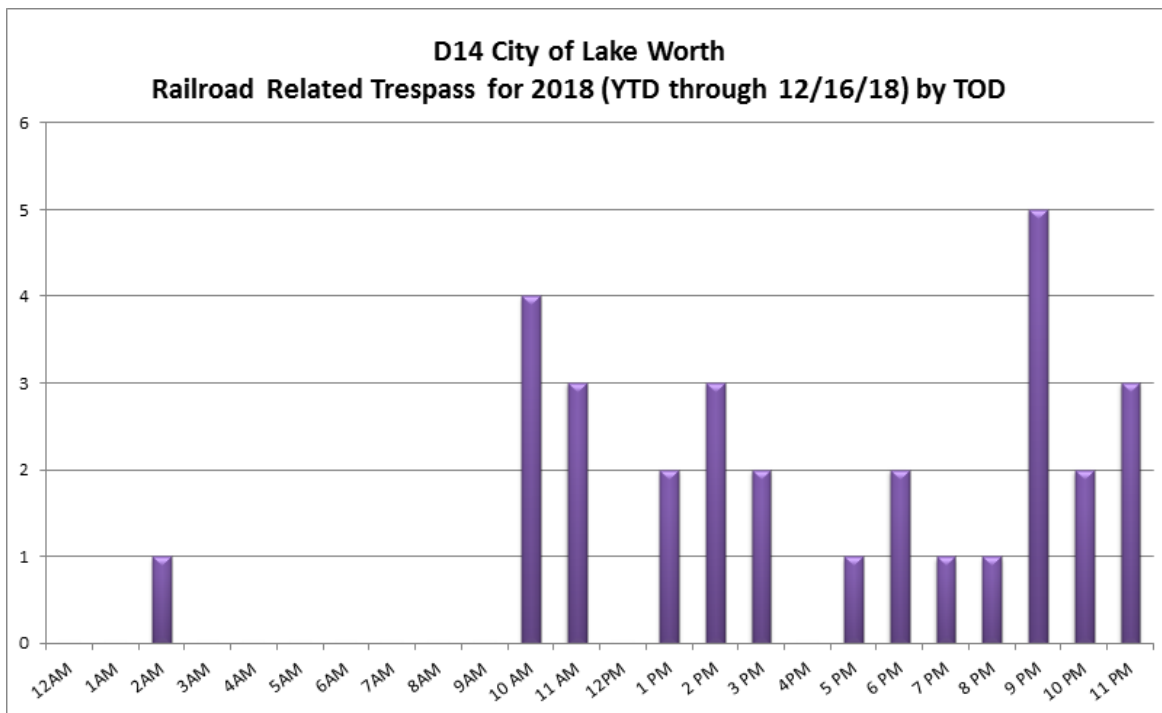


Figure 10: Lake Worth Counts of Rail Trespassers for 2018 by Time of Day

The Sheriff's Office also provided trends on rail-related incidents as reported from the railroads from 2016 to the end of 2018. [Figure 11](#) shows the counts of rail-related incidents by type of incident. [Figure 12](#) shows the counts of rail related incidents by year, and [Figure 13](#) shows the counts of rail-related incidents by year and milepost.

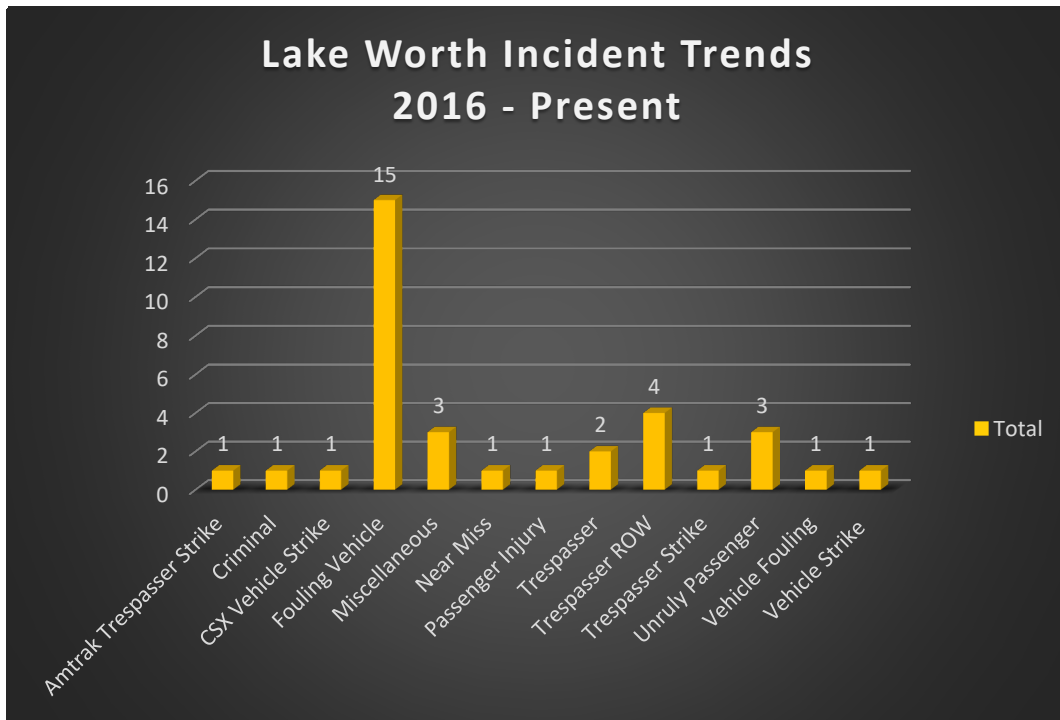


Figure 11: Counts of Lake Worth Rail-Related Incidents 2016-2018 by Type of Incident

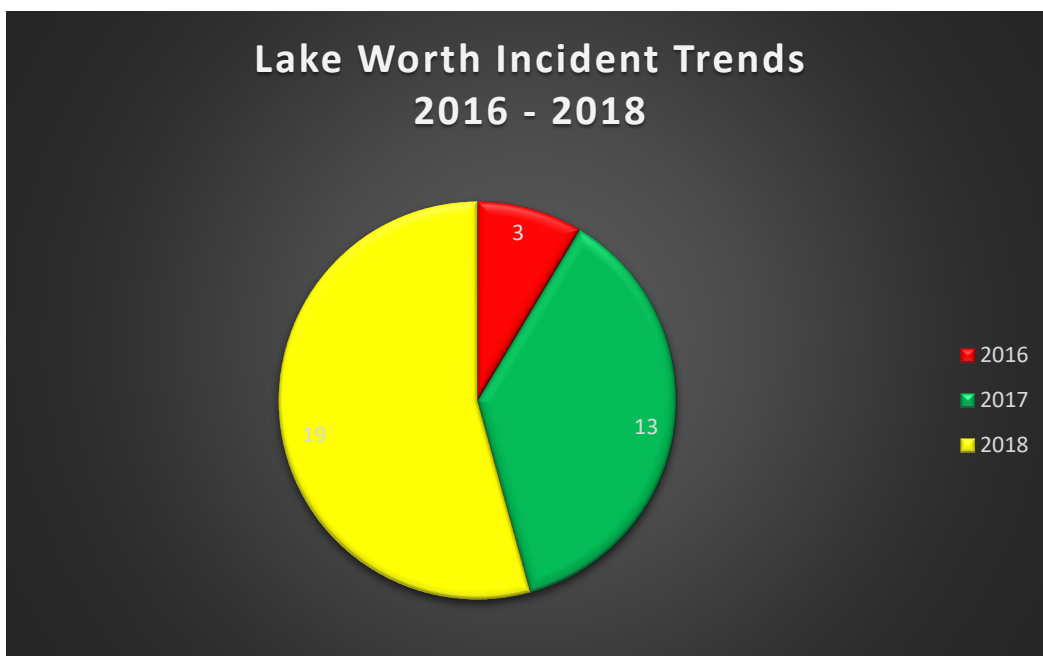


Figure 12: Counts of Lake Worth Rail-Related Incidents by Year

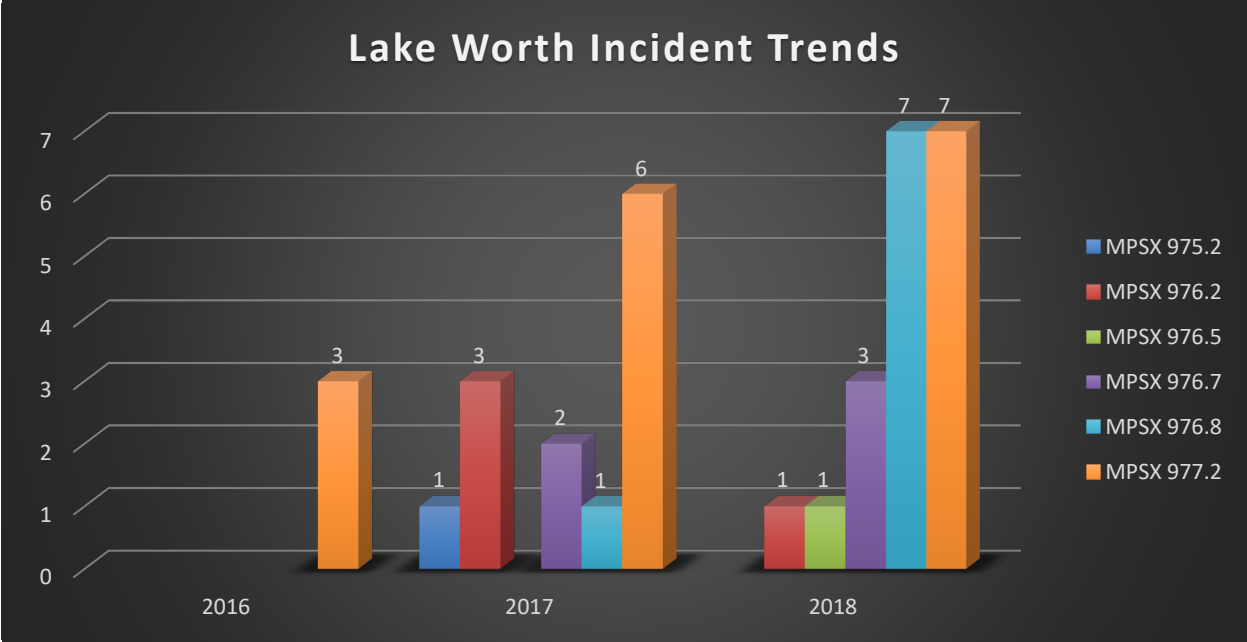


Figure 13: Counts of Lake Worth Rail-Related Incidents by Milepost and Year

The team also collected casualty data from previous years for the same months as the program activities. The data were from the FRA Office of Safety Analysis website.¹ The data provided county information and latitude/longitude coordinates which were used to identify the incidents that occurred in Lake Worth. Table 3-2 shows the rail trespass casualties in Lake Worth from June through September of 2017 and 2018.

Table 3-2: Rail Casualties June–September 2017, 2018

Time Period	Total Casualties
June-September 2017	1
June-September 2018	2

3.1.2 Trespass Data during Grant Project Implementation

The Sheriff’s Office conducted 25 enforcement patrols during the 6-month period of performance. This totaled to 171.5 hours of patrol. Table 3-3 presents a summary of the trespass enforcement activity. The counts of warnings, citations and arrests do not sum to the trespasser total. Trespassers could have received no or multiple enforcement actions. The Sheriff’s Office supplied trespasser demographic counts by age and gender are also in Table 3-3.

Table 3-3: Lake Worth Trespass Enforcement Activity Summary

Patrols		Trespassers										
Count	Hours	Count	Citations	Arrests	Warnings	Male	Female	No gender reported	Age 0-17	Age 18-39	Age 40 +	No age reported
25	171.5	294	8	110	184	189	83	22	37	154	81	22

The Sheriff’s Office used technology to enhance their enforcement efforts including a drone and cameras equipped with night vision. [Table 3-4](#) shows the counts of different type of enforcement tools that were used during the patrols. Some patrols utilized multiple tools, while others did not use any of these tools.

Table 3-4: Counts of Enforcement Tools Used in Lake Worth

Enforcement Tool	Count
Unmarked vehicle	25
Real-time crime center	24
Drone	7
Camera	4
Night Vision	3
Polaris	1

[Table 3-5](#) shows the counts of different reasons for rail trespassing in Lake Worth. Trespassers encountered in Lake Worth were primarily using the rail line as a shortcut, although approximately 10 percent were engaged in some form of illegal activity. During the course of the grant performance period, officers noted 10 homeless encampments on the rail ROW during their patrols.

Table 3-5: Counts of Reason for Trespassing in Lake Worth

Reason for Trespassing	Frequency Count
Shortcut	216
Illegal activity	28
Homeless encampments	10
Recreation	2
Suicide	1
None/Blank	37

[Figure 14](#) below shows the number of trespassers encountered per month during the grant period.

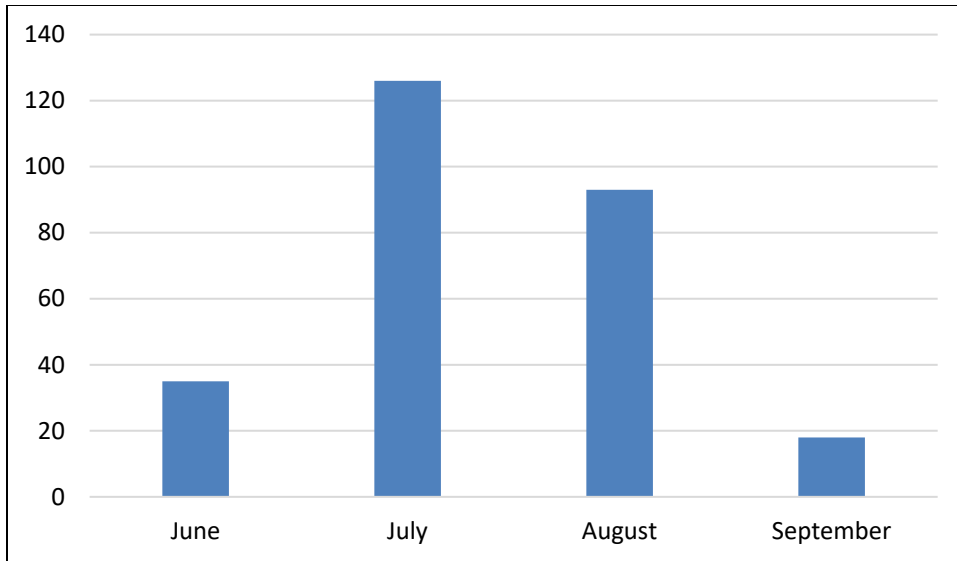


Figure 14: Counts of Trespassers in Lake Worth by Month

3.1.3 Impact of Grant Activities on Reducing Rail Trespassing

The Sheriff’s Office created a more robust rail trespasser prevention program in Lake Worth. The rail line through the city had increased rail traffic and train speeds in 2018 and 2019 with the inauguration of Brightline service through the area. The expectation was that without additional treatments, the risk on the rail line would continue to increase and more incidents would be expected.

However, when looking at the same time of year (June to September) as the grant performance period for 2017, 2018, and 2019, the count of rail trespassing casualties reported to FRA went down while the Sheriff’s Office was performing trespassing enforcement in 2019. See [Table 3-6](#).

Table 3-6: Rail Trespass Casualties, June-September 2017, 2018, 2019

Period	Total Casualties
June–September 2017	1
June–September 2018	2
June–September 2019	0

From June–September 2019, the Sheriff’s Office encountered 294 trespassers. From 2016 to 2018, the office recorded an average of 51.5 trespasser incidents per year. The railroad reported eight trespassers from 2016 to 2018, two of whom were struck by a train.

From June–September 2019, the number of trespassers that officers encountered per patrol decreased, as shown in [Figure 15](#). This could be an indication of safer rail-related behavior in Lake Worth as program activities continued.

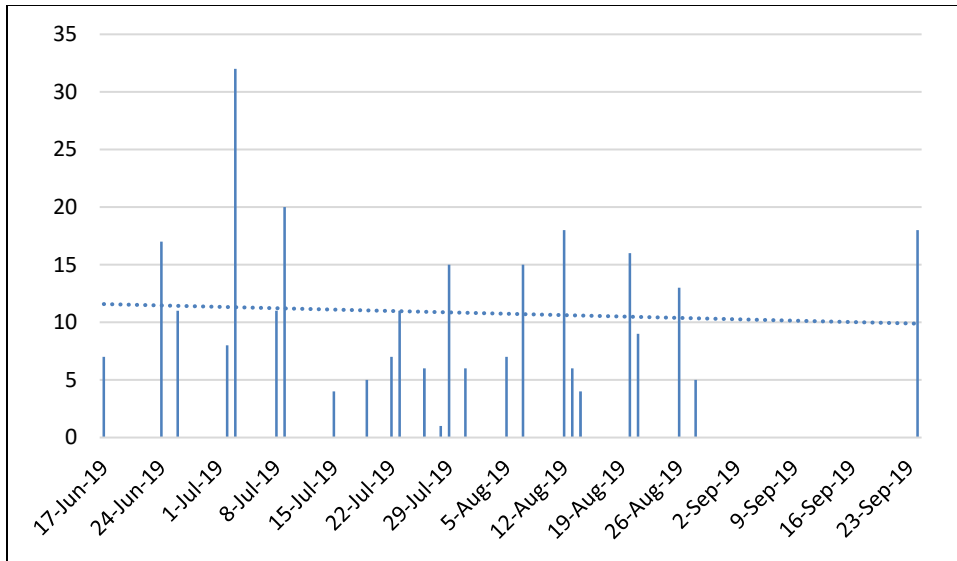


Figure 15: Count of Trespassers per Patrol in Lake Worth

The Sheriff’s Office planned to use drone technology during their trespasser enforcement efforts in the City of Lake Worth. Although there was agreement with the railroad, Florida State statutes forbid the use of drones to observe violations. The drones were used to track suspects who fled from the area.

The Sheriff’s Office reported their own positive impacts of the program in their final report to FRA.

“During the course of enforcement, other felony cases were made and violent crimes were solved and suspects identified. Violent suspects including business robbers and violent gang members were arrested. In one case, an MS-13 gang member was stopped, identified and deported as a result of the trespass investigation. In two other cases, shoplifters were stopped...In another case, a child neglect case was uncovered upon contact with a trespass violator...It was quickly learned, trespassers were involved in other felonious activities that were brought to light as a result of this operation...

“Public Benefits:

“The public benefits included a reduction in railway trespassing related injuries and incidents; the unintended consequence of identification of felonious behavior and persons who were wanted for other, more serious violent crimes and child neglect; an overall improvement in public safety for the community.”

3.2 Worcester, Massachusetts

The City of Worcester reported its enforcement activities weekly during the performance period. Data reported for the period prior to the project was gathered from police dispatch calls and from the FRA-sponsored trespass research study conducted before the grant period. The study provided information from surveillance cameras installed to monitor high-risk areas along the rail line.

3.2.1 Trespass Data before Grant Project Implementation

The team also collected casualty data from previous years for the same months as the grant activities. The data was from the FRA Office of Safety Analysis website.¹ The data provided county information and latitude/longitude coordinates, which were used to identify the incidents that occurred in the City of Worcester. There were no rail trespass casualties reported to the FRA for May to September of 2017 and 2018.

WPD reported the calls they made for rail trespassing in 2018. It responded to eight railroad trespass related incidents in 2018, as shown in [Table 3-7](#).

Table 3-7: Worcester Police Department Railroad Trespass Incidents, 2018

Violation Number	Book Date and Time	Offense Location	Description
2018000002554	6/14/2018 16:04	42 CRYSTAL ST	Railroad Track, Walk/Ride On
2018000002555	6/14/2018 16:26	42 CRYSTAL ST	Railroad Track, Walk/Ride On
2018000002681	6/22/2018 18:22	45 SHREWSBURY ST	Railroad Track, Walk/Ride On
2018000002929	7/7/2018 17:29	58 SHREWSBURY ST	Railroad Track, Walk/Ride On
2018000004153	9/21/2018 23:57	21 ILLINOIS ST	Railroad Track, Walk/Ride On
2018000004689	11/1/2018 3:36	87 MILLBURY ST	Railroad Track, Walk/Ride On

3.2.2 Trespass Data during Grant Project Implementation

Worcester implemented its program activities from May through September 2019. WPD patrolled previously-identified hotspots along the rail corridor, and the patrol officers were supplemented by camera footage and artificial intelligence software to identify trespassing events. [Table 3-8](#) shows the summary data from the trespassers encountered during trespass prevention activities. As with the other communities, the warnings, citations, and arrests do not sum to the trespasser total. Trespassers could have received no or multiple enforcement actions. For each patrol, the officers reported demographic data on the trespassers encountered. There were three times as many male trespassers as female trespassers and almost all of the trespassers for whom age was collected were adults.

Table 3-8: City of Worcester Trespass Enforcement Activity Summary

Patrols		Trespassers										
Count	Hours	Count	Citations	Arrests	Warnings	Male	Female	No gender reported	Age 0-17	Age 18-39	Age 40+	No age reported
70	281.5	51	23	3	9	28	9	14	1	21	20	9

Worcester reported its data through handwritten forms filled out by the officer on the scene. As such, there were variations in the information provided in each field. The data collected for whether a warning or citation was issued or an arrest made contained 12 different responses (see [Table 3-9](#)). The responses were regrouped by the study team according to the color coding in [Table 3-9](#), and [Table 3-10](#) shows the counts grouped into the fields Warning, Citation, Arrest, or None – N/A.

Table 3-9: Counts of Responses to Warning, Citation, or Arrest Data Field as Received from the Worcester Police Department

Warning, Citation or Arrest	Frequency
Arrest	3
Summons	22
Summons: Trespassing	1
Warning	3
Warning / Outreach	4
Warning: Outreach	2
C.I.T. to be notified	1
N/A	4
None	1
None / No Contact Made	3
Outreach	2
Outreach to CIT	1

Table 3-10: Counts of Warning, Citation or Arrest (regrouped responses)

Warning, Citation or Arrest	Frequency
Arrest	3
Citation/Summons	23
Warning	9
None - N/A	12

WPD also came upon 44 homeless encampments during the grant-funded patrols.

3.2.3 Impacts of Grant Activities on Reducing Rail Trespassing

Worcester has been actively engaged with FRA in reducing rail trespassing in the community: first through the pre-project trespass prevention study and again through this pilot program. WPD reported responding to eight railroad trespass-related calls in 2018. During the performance period May to September 2019, officers encountered 51 trespassers on the target stretch of rail line. This was an over six-fold increase in the number of trespassers removed from the tracks before a casualty occurred.

From May to September of 2019, the number of trespassers that officers encountered per patrol decreased. This could be an indication of safer rail-related behavior in Worcester as project activities continued; see [Figure 16](#).

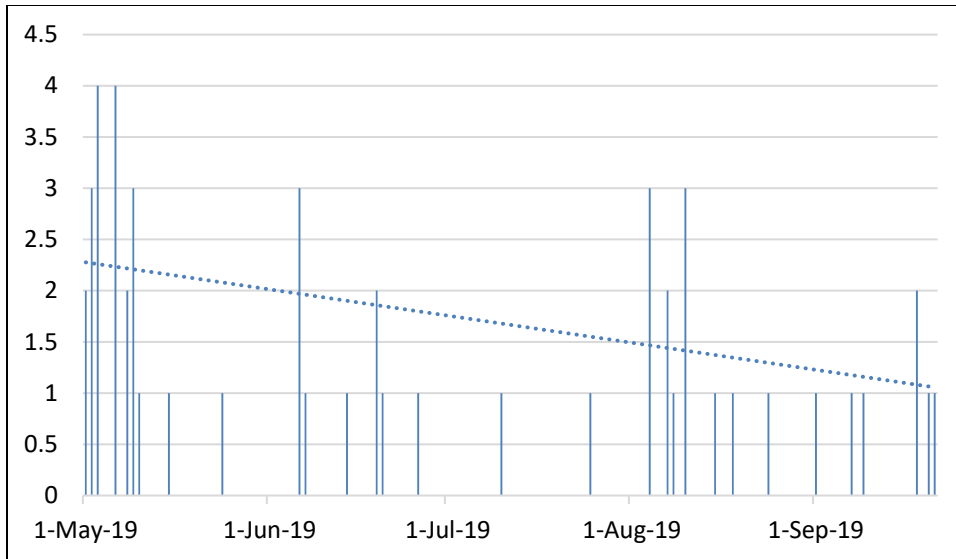


Figure 16: Count of Trespassers per Patrol in Worcester

As part of the earlier rail trespass prevention study in 2017, the City of Worcester installed a camera at the [Cambridge Street overpass](#) along the CSX tracks to capture rail trespass events. A comparison analysis of the trespass frequency of the May–October period between 2018 and 2019 revealed a 23 percent drop in ROW trespass frequency at that location (from 2.01 per day in 2018 to 1.54 in 2019). Additionally, the monthly numbers for 2019 during the May–October enforcement activities are shown in [Table 3-11](#). As shown in [Figure 17](#), there was a consistent monthly downward trend throughout the period except for August, where the numbers were driven up mostly because of a homeless encampment that remained there until removed by the police.

Table 3-11: Average Number of Trespassers per Day at Cambridge Street Overpass

Month	Trespassers (average per day)
May 2019	2.6
June 2019	2.2
July 2019	1.4
August 2019	1.7
September 2019	0.7
October 2019	0.6

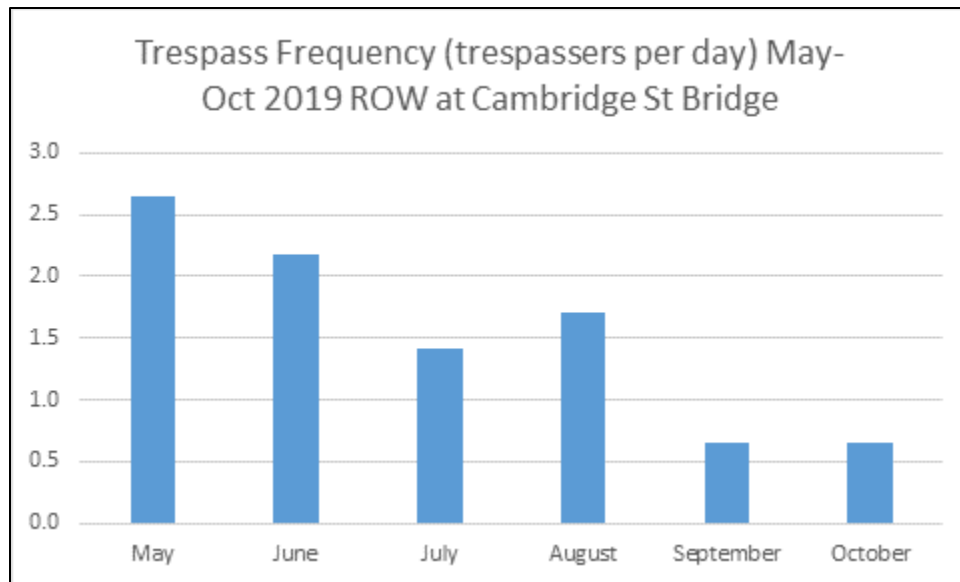


Figure 17: Average Number of Trespassers per Day at the Cambridge Street Overpass

3.3 North Tonawanda, New York

North Tonawanda reported its trespasser data weekly during the performance period. The sheets were filled out by the patrolling officers for each trespass encounter. The North Tonawanda Police Department also reported its rail-related dispatch calls from November 2018 to April 2019, before beginning project activities.

3.3.1 Trespass Data before Grant Project Implementation

North Tonawanda provided rail trespassing enforcement data from November 2018 to April 2019. This data came from rail-related calls to the North Tonawanda Police Department.

Before the project period, the North Tonawanda Police Department received 31 rail-related calls, most regarding malfunctioning highway-rail grade crossing warning devices. There were two vehicle/train accidents, five vehicles reported stuck on the tracks, and one trespasser on a dirt bike. Table 3-12 below shows the classification for each call.

Table 3-12: Classification of Rail-related Calls to the North Tonawanda Police Department, November 2018 to April 2019

Call Classification	Count
Accident	2
Crossing malfunction	21
Other	2
Trespasser	1
Vehicle	5
Total	31

The team also collected casualty data from previous years for the same months as the project activities. The data was from the FRA Office of Safety Analysis website.¹ The data provided county information and latitude/longitude coordinates used to identify incidents in North

Tonawanda. There were no rail trespass casualties reported to the FRA for May to November of 2017 and 2018.

3.3.2 Trespass Data during Grant Project Implementation

The North Tonawanda Police Department conducted 47 grant-funded enforcement patrols during the six-month period of performance. This totaled 190 patrol hours. A summary of the trespass enforcement activity is presented in [Table 3-13](#). The North Tonawanda Police Department supplied trespasser demographic information. There were twice as many male trespassers as female, and one-third of trespassers were juveniles.

Table 3-13: North Tonawanda Trespass Enforcement Activity Summary

Patrols		Trespassers										
Count	Hours	Count	Citations	Arrests	Warnings	Male	Female	No gender reported	Age 0-17	Age 18-39	Age 40 +	No age reported
47	190	157	92	2	30	103	49	5	27	37	71	22

The data reported from the Police Department contained different nomenclature in the fields that captured whether the trespasser was issued a warning or citation, or arrested. [Table 3-14](#) below shows the counts based on the data provided to FRA and the Volpe Center. The data has been reclassified in [Table 3-15](#).

Table 3-14: Warnings, Citations, and Arrests as Received from North Tonawanda Police Department

Warning, Citation, or Arrest Code	Frequency
Warning (JAB Card)	3
1 UTT	1
1176	5
1176 UTL	3
1176VTL Citation	1
1187 UTL	1
1225D	1
2 UTT	1
3utt co	1
60A	1
63-14	1
801 Flyers	1
Advised	1
Arrest VTL511VTL 4011A	1
C	7
CIT	4
CO	6
Citation	45

Warning, Citation, or Arrest Code	Frequency
Citation & Arrest (warrant)	1
Citation 2UTT	1
JAB	1
JAB Card	2
JAB Card Warning	1
Juvenile card	2
N/A	3
NT149T95V4 (1176)	1
NT149T9TQN (1176)	1
NT149T9WV5 (1176)	1
NT149T9X41 (1176)	1
NT199T9WV5 (1176)	1
NT199TB4T2 (1176)	1
None	1
UTT	14
UTT/1176	7
UTT/306B	1
UTTS	2
Warn/JAB card	7
Warning	10
Warning JAB Card	1
Warning Vehicle Suspended. Driver Advised	1
Warning – JAB Card	1
Warning JAB Cards	1
Y	3

Table 3-15: Warnings, Citations, and Arrests Reclassified

Warning, Citation or Arrest	Frequency
Arrest	2
Citation	92
Warning	30
Unknown	26

The primary reasons for trespassers being on the tracks are shown in [Table 3-16](#).

Table 3-16: Counts of Reason for Trespassing in North Tonawanda

Reason for Trespassing	Frequency Count
Walking	43
Vehicle/Driving	21
Dirt Bike/ATV/UTV	20
Other	57
Blank	16

The Police Department also reported distributing 81 rail safety related flyers to the community as part of their enforcement activities.

3.3.3 Impacts of Project Activities on Reducing Rail Trespassing

The North Tonawanda Police Department responded to 31 rail-related calls in 2018, only one of which was a trespasser. During the grant performance period May to November 2019, officers encountered 157 rail trespassers. This marked increase in rail trespassing enforcement shows that enforcement activities were addressing a prevalent problem in North Tonawanda.

Figure 18 shows the number of trespassers encountered per patrol during the project period. The trend increased from May to November; however, the majority of the enforcement activities occurred in July, August, and September 2019 when the Police Department indicated it would target summer festivals and gatherings. Figure 19 shows that the trend in trespasser counts during these target months.

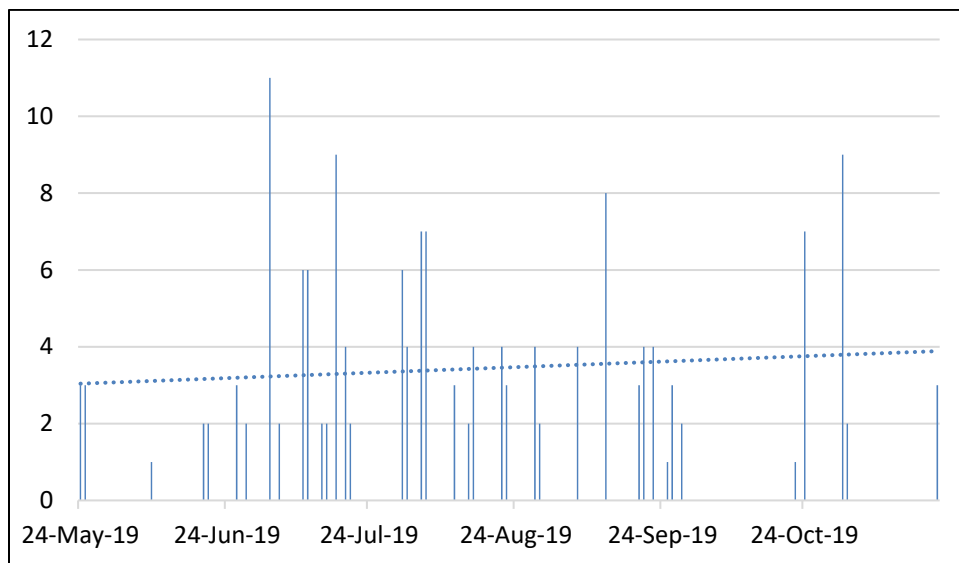


Figure 18: Count of Trespassers per Patrol in North Tonawanda

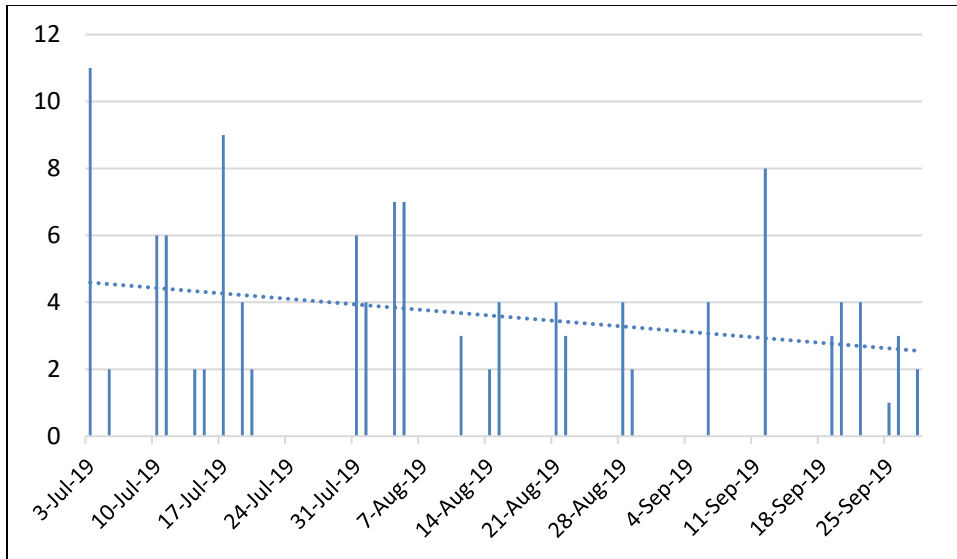


Figure 19: Count of Trespassers per Patrol in North Tonawanda – July, August, and September 2019

The police lieutenant in charge of the program reported the following benefits to his agency and the community.

“Originally when I set the grant up I believed we had a trespassing problem in the form of people walking on the tracks.

I did not realize that there was a lot of other problems also which included people parking on the tracks, accidents, people walking their dogs and people using the railroad as an escape route for crimes (larceny/burglary) from our businesses that are on the railroad tracks.”

3.4 Brighton, New York

The Town of Brighton reported its activities monthly in a Microsoft Excel spreadsheet with relevant fields. The town also provided data on calls for service to the railway before project activities began.

3.4.1 Trespass Data before Grant Project Implementation

In 2017, the Brighton Police Department responded to three calls for trespassers along the rail ROW. In two of the cases, warnings were issued. The other trespasser was gone before officers arrived.

The research team also collected casualty data from previous years for the same months as the project activities. The data was from the FRA Office of Safety Analysis website.¹ The data provided county information and latitude/longitude coordinates used to identify the incidents in Brighton. There were no rail trespass casualties reported to FRA for May to September of 2017 and 2018.

3.4.2 Trespass Data during Grant Project Implementation

The Brighton Police Department conducted 15 project enforcement patrols during 8 weeks in the summer of 2019, for a total of 60 hours of patrol. Monthly reports from the Brighton Police Department supplied enforcement outcomes and trespasser demographic information. [Table 3-17](#) presents a summary of the trespass enforcement activity in the Town of Brighton.

Table 3-17: Brighton Trespass Enforcement Activity Summary

Patrols		Trespassers								
Count	Hours	Count	Citations	Arrests	Warnings	Male	Female	age 0-17	age 18-39	age 40 +
15	60	8	0	0	8	4	4	2	2	4

All the enforcement patrols were foot patrols between mileposts 365 and 367 on the CSX rail line. [Table 3-18](#) shows the reasons the trespassers were on the railroad ROW.

Table 3-18: Brighton Reasons for Trespassing Counts

Reason for Trespassing	Frequency Count
Biking	2
Dirt Bike	1
Recreation	1
Shortcut	2
N/A	9

3.4.3 Impacts of Grant Activities on Reducing Rail Trespassing

During the performance period, the Brighton Police Department increased its presence on the ROW. When the officers were patrolling the railway from June to September, the number of trespassers they encountered decreased over time. [Figure 20](#) shows the average number of trespassers encountered per patrol by month.

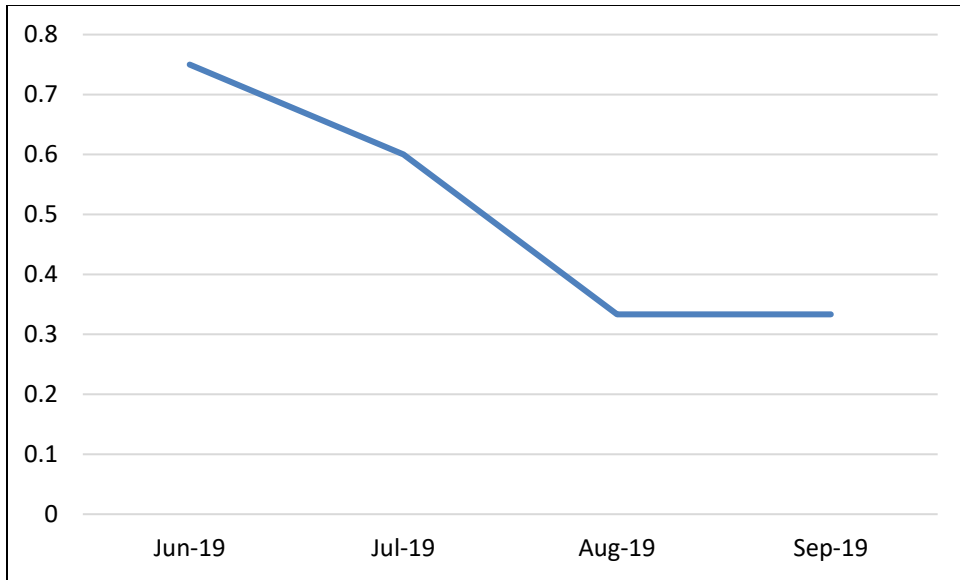


Figure 20: Average Trespassers Encountered per Patrol

4. Conclusion

The Law Enforcement Strategies for Reducing Trespassing pilot program showed positive safety benefits for participating communities. It improved rail safety awareness and reduced rail trespass events through targeted enforcement initiatives. The dedicated funding sources for the rail trespasser enforcement meant that rail safety and trespass prevention were not competing with other priorities for funding or officer time. This program allowed officers to encounter trespassers before an incident or accident could occur, and expanded their reach beyond the normal calls for service, thereby increasing rail safety awareness.

All four participating law enforcement agencies interacted with more trespassers than through routine dispatch calls for service. Most communities saw a decrease in the number of trespassers encountered per patrol as the program went on, indicating a positive reduction in trespassers along the rail ROW. Some communities reported other benefits to the program such as policing other illegal activity and gaining a better understanding of trespassing frequency.

The analysis of the impacts and benefits of the trespass prevention enforcement was limited by the data reporting associated with the project. Therefore, to improve the effectiveness of future analysis, the research team urges consistent data reporting methods from all participating communities. The data reported before the community begins project activities should be in the same format, with data fields similar to those collected during the grant. Additionally, consistent input is needed when reporting grant activities. There should be a limit on free-text fields and handwritten submissions; these result in varied responses and leave the fields up for interpretation. Additionally, the collection of trespassing data after project activities were finished would provide a more complete picture of the effects.

5. References

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Federal Railroad Administration. (September 2018). [FY18 Law Enforcement Strategies Grant Program - Selected Projects](#).

Federal Register (February 22, 2018). [Notice of Funding Opportunity for Law Enforcement Strategies for Reducing Trespassing Pilot Grant Program](#).

Harrison, J., and daSilva, M. (May 2017). [2015 Right-of-Way Fatality and Trespass Prevention Workshop](#).

Abbreviations and Acronyms

ATV	All-Terrain Vehicle
CSX	CSX Transportation
DOT	U.S. Department of Transportation
FEC	Florida East Coast Railway
FRA	Federal Railroad Administration
NOFO	Notice of Funding Opportunity
RD&T	Research, Development and Technology
UTV	Utility Terrain Vehicle
Volpe Center	John A. Volpe National Transportation Systems Center
WPD	Worcester Police Department