



# TRESPASS PREVENTION RESEARCH STUDY – WORCESTER, MA

## SUMMARY

The U.S. Department of Transportation (US DOT) John A. Volpe National Transportation Systems Center (Volpe), under the direction of the Federal Railroad Administration (FRA) Office of Research, Development, and Technology (RD&T), conducted a Trespass Prevention Research Study (TPRS) on a railroad right-of-way (ROW) in Worcester, Massachusetts.

Volpe researchers conducted the TPRS from 2016–2018 to show the potential benefits of, document the lessons learned from, and provide recommendations for the implementation and evaluation of trespass prevention strategies following the Community, Analysis, Response, and Evaluation (CARE) model developed by FRA in collaboration with Transport Canada [1]. CARE’s goal is to create safer communities by developing long-term trespass prevention strategies through collaborative partnerships.

Volpe staff worked with FRA, railroads, and local stakeholders to implement the CARE model on rail ROWs within the city. A stakeholder group was formed, data was collected and analyzed, recommendations were developed for key trespass areas, and the city and railroads began to implement those recommendations at the end of the study.

Results indicated that the CARE model was an effective approach to railroad trespass prevention that engaged community representatives in a collaborative problem-solving effort to reduce trespass incidents. However, a notable weakness of the CARE model was its resource- and time-intensity, requiring committed stakeholders with the power and funding to implement proposed responses.

## BACKGROUND

Trespassing along railroad ROWs is the leading cause of rail-related deaths in the U.S.; more than 500 trespass fatalities and nearly as many injuries occur each year [2]. The vast majority of these are preventable. By definition, trespassing on railroad property is illegal.

FRA, in collaboration with Transport Canada, developed community-based trespass prevention guidelines in the form of the CARE model published in 2012 [1]. The model is designed to provide a step-by-step approach for addressing railroad trespassing issues in communities (Figure 1). It establishes a framework for stakeholders to organize, collect, and evaluate the data, develop solutions, and implement trespass mitigation strategies. It increases stakeholder collaboration, leverages collective resources, and maximizes overall effectiveness of the community-based effort to decrease trespassing on railroad ROWs.

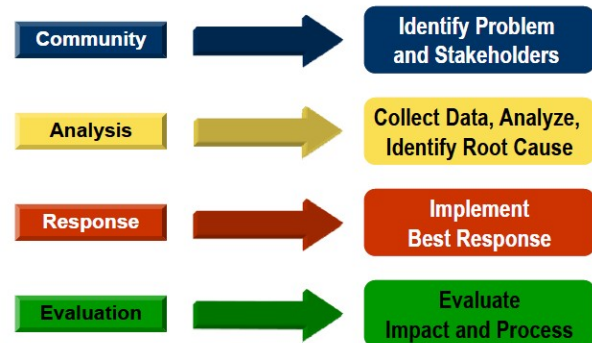


Figure 1. CARE Model

The Volpe Center conducted the first TPRS in 2009–2013 with the goal of developing and demonstrating trespass prevention and mitigation best practices based on the CARE model. It focused on a 12-mile stretch of ROW in



West Palm Beach, Florida. The implementation and evaluation of the guidelines during that demonstration project resulted in several lessons learned and recommendations for future implementations [3] [4].

In response to recommendations from the first study, RD&T funded an additional TPRS in 2016 to further research the feasibility and potential benefits of the process.

## OBJECTIVES

Researchers wanted to demonstrate the potential benefits, as well as best practices and lessons learned, of implementing and evaluating trespass prevention strategies following the CARE community-based approach on the rail network in Worcester, Massachusetts.

## METHODS

Volpe and FRA partnered with the City of Worcester, CSX, Providence and Worcester Railroad (P&W), Pan Am Railways, MBTA, and other local organizations to form a stakeholder group, collect and analyze rail trespassing data, develop recommendations for key trespass areas, and work with the city and railroads to begin implementation of those recommendations. Additionally, researchers collected baseline data on one selected trespass location over an 8-month period before the treatments' installation, scheduled to occur after the conclusion of the study.

## RESULTS

Volpe partnered with several railroad stakeholders and the City of Worcester to implement the CARE model.

### Location

The City of Worcester saw two rail trespass fatalities and one injury from December 2012 to January 2016. The locations selected were along CSX and P&W ROWs through the city, as shown in [Figure 2](#).

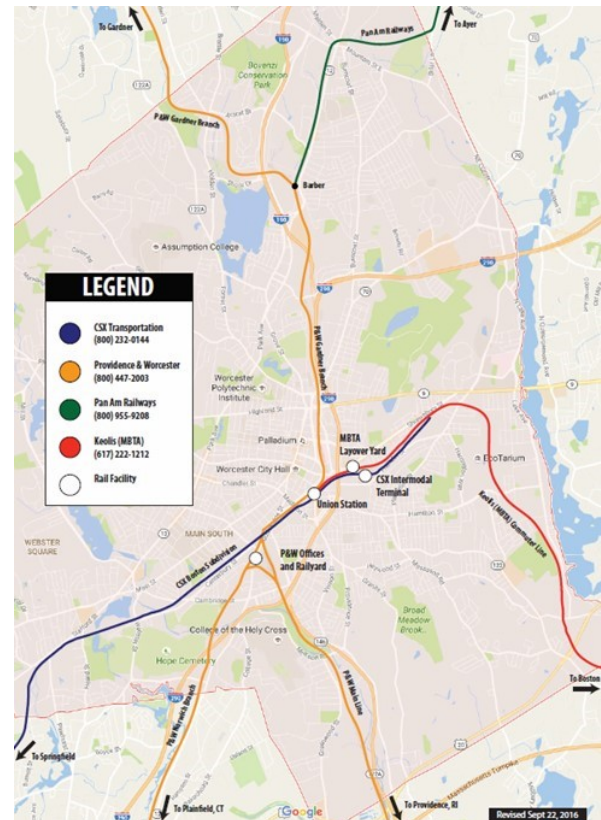


Figure 2. City of Worcester Rail Map

### CARE Model

The research team, along with FRA, worked with stakeholders to execute the step-by-step CARE approach for addressing rail ROW trespassing issues within the city.

The first step in the CARE process (*Community*) was to identify the trespassing problem, assemble all of the potential stakeholders, organize a problem-solving meeting to discuss the issues, and develop an action plan. This step was initiated in August 2016 with a kickoff meeting at Worcester City Hall with all identified stakeholders. This group then met regularly over the next 18 months, with the final recent meeting on March 28, 2018.

The second step (*Analysis*) involved collecting information about the trespassing problem and determining its underlying causes. Information was collected from the railroads and the city, as well as from site visits and targeted data collection activities. Five specific ROW locations were initially selected for data collection,



analysis, and intervention. Of those, the stakeholder group focused first on the ROW under the Cambridge Street bridge (Crossing ID 501786C). Volpe staff installed a camera at that location and provided remote access for the Worcester Police Department. Video data were analyzed for 30-day period from 9/19/17 to 10/18/17 to gather information on trespass event frequency, demographics, and purpose.

Analysis of the video data revealed a total of 115 trespassers (95 male, 20 female) during the 30-day period. About 60 percent of the trespassers were physically on the tracks, while the rest loitered on the ROW under the bridge. Most of those loitering were possibly injecting or smoking drugs, as evidenced by analysis of the video. An example of a trespass event at that location is shown in [Figure 3](#).

The third CARE step (*Response*) was to identify and implement the most effective and feasible responses to help solve the underlying causes of trespassing at all five locations. Specific to the Cambridge Street bridge location, a set of recommended strategies on engineering treatments, education outreach activities, and law enforcement actions were developed with the stakeholder group. Some of the recommendations, including continuing outreach to the homeless population, adding NO TRESPASSING signage, and increasing enforcement patrols, were implemented during the study. Other recommendations, such as adding fencing, were scheduled for after the conclusion of the study.



**Figure 3. Rail ROW Trespass Example from Cambridge St. Bridge Location in Worcester**

The fourth step of the CARE process (*Evaluation*) involved determining if the response was effective in reducing or eliminating the trespass problem and returning to the *Analysis* step if it was not. This step was not reached before the conclusion of the study period.

## CONCLUSIONS

This implementation of the CARE model demonstrated some of its potential strengths and weaknesses. The CARE guidelines provided a structure under which stakeholders and their resources could be effectively organized, as well as a process by which to analyze the trespass problem and its underlying causes, develop a set of responses, and evaluate their impacts. It added an additional layer of safety improvement through increasing stakeholder collaboration and leveraging collective resources, thereby aiming to maximize overall effectiveness. The process also worked well in creating and fostering stakeholder buy-in, building consensus, and facilitating the discussion from multiple perspectives.

However, a notable weakness of the CARE model is its resource- and time-intensity, requiring committed stakeholders with the power and funding to employ proposed responses. Federal staff (Volpe and FRA) contributed heavily to the stakeholder group in all phases of the CARE process. However, it is not known if a community could take on implementing the CARE model on its own, where data collection, analysis, and implementation funding and other resources may be severely limited.

## FUTURE ACTION

FRA continues to provide support to the City of Worcester in this area and will analyze the effectiveness of implemented interventions and disseminate findings to rail safety stakeholders. Lessons learned from the study will also be applied to identify the appropriate circumstances where community-based interventions are warranted and likely to be effective.



## REFERENCES

- [1] FRA Office of Railroad Safety. (2011). [Community Trespassing Prevention Guide](#).
- [2] FRA Office of Safety Analysis. (June 2018). <https://safetydata.fra.dot.gov/>
- [3] FRA. (July 2014). [Trespass Prevention Research Study – West Palm Beach, FL](#) [DOT/FRA/ORD-14/19].
- [4] FRA. (June 2015). [Evaluation of FRA Trespass Prevention Research Study](#) [RR 15-21].

## ACKNOWLEDGMENTS

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## CONTACT

**Francesco Bedini Jacobini**  
Program Manager  
Federal Railroad Administration  
Office of Research, Development, and  
Technology  
1200 New Jersey Avenue, SE  
Washington, DC 20590  
(202) 493-0800  
[Francesco.Bedini@dot.gov](mailto:Francesco.Bedini@dot.gov)

**Marco da Silva**  
Senior Engineer  
Volpe National Transportation Systems Center  
Systems Safety and Engineering Division  
55 Broadway, Cambridge, MA 02142  
(617) 494-2246  
[marco.dasilva@dot.gov](mailto:marco.dasilva@dot.gov)

## KEYWORDS

Railroad trespassing, trespass prevention, right-of-way trespass, railroad safety, stakeholder engagement

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