U.S. Department of Transportation

Federal Railroad Administration

2012 Right-of-Way Fatality and Trespass Prevention Workshop

Office of Research
and Development
Washington, DC 20590

DOT/FRA/ORD-13/18

Final Report
April 2013

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	April 2013	Final Report August 14–16, 2012

4. TITLE AND SUBTITLE
2012 Right-of-Way Fatality and Trespass Prevention Workshop

5. FUNDING NUMBERS
RR97A5-KLA51
RR98A1-KT799
TF03A1-KJ139

6. AUTHOR(S)
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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
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Research and Innovative Technology Administration
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8. PERFORMING ORGANIZATION REPORT NUMBER
DOT-VNTSC-FRA-12-06

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U.S. Department of Transportation
Federal Railroad Administration
Office of Research and Development
Washington, DC 20590

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
DOT/FRA/ORD-13/18

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
This document is available to the public through the FRA Web site at www.fra.dot.gov or by calling (202) 493-1300.

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

Based on the success of the 2008 Trespasser Workshop, FRA and FTA sponsored this follow-on workshop. The keynote speech by FRA Administrator, Mr. Joseph C. Szabo, was followed by 23 technical presentations in the areas of Pedestrian Safety, Hazard Management, Design Technology and Infrastructure, Community Outreach, Enforcement, and Intentional Deaths/Acts. Workshop attendees broke into working groups charged with developing prioritized recommended actions for their respective topics; they developed more than 90 ideas which covered new or expanded initiatives, strategies, and research projects. Each group then defined three to five top recommended actions for its respective topic area. This resulted in the identification of 23 high-priority recommended actions.

14. SUBJECT TERMS	15. NUMBER OF PAGES
FRA, FTA, railroads, light rail, transit, trespass, right-of-way	69
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std.
239-18
298-102

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1 foot (ft) = 30 centimeters (cm)	1 centimeter (cm) = 0.4 inch (in)
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1 mile (mi) = 1.6 kilometers (km)	1 meter (m) = 1.1 yards (yd)
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1 square yard (sq yd, yd^2) = 0.8 square meter (m^2)	1 square kilometer (km^2) = 0.4 square mile (sq mi, mi^2)
1 square mile (sq mi, mi^2) = 2.6 square kilometers (km^2)	10,000 square meters (m^2) = 1 hectare (ha) = 2.5 acres
1 acre = 0.4 hectare (he) = 4,000 square meters (m^2)	
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	= 1.1 short tons
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1 quart (qt) = 0.96 liter (l)	
1 gallon (gal) = 3.8 liters (l)	
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1 cubic yard (cu yd, yd^3) = 0.76 cubic meter (m^3)	1 cubic meter (m^3) = 1.3 cubic yards (cu yd, yd^3)
TEMPERATURE (EXACT)	**TEMPERATURE (EXACT)**
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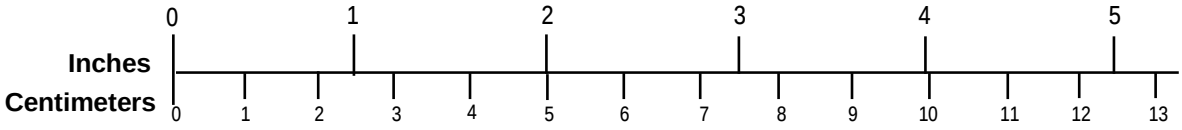
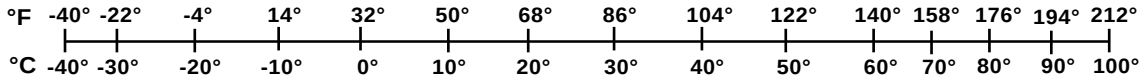
QUICK INCH - CENTIMETER LENGTH CONVERSION



QUICK FAHRENHEIT - CELSIUS TEMPERATURE CONVERSIO



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

Updated 6/17/98

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Acknowledgements

The authors wish to thank Dr. Tarek Omar, Program Manager, Train Control and Communications Division, U.S. Department of Transportation (U.S. DOT) Federal Railroad Administration (FRA); Mr. Ronald Ries, Staff Director, Highway-Rail Grade Crossing and Trespasser Prevention Program, FRA; and Mr. Levern McElveen, Program Manager, State Safety Oversight, U.S. DOT Federal Transit Administration (FTA) for their insight, guidance, and direction in developing this report.

The authors also wish to extend special thanks to the Steering Committee members for their partnering contributions to the successful planning and conduct of this research-needs workshop. The Steering Committee members are as follows:

Dale Bray	Union Pacific Railroad (UP)
Debra Chappell	FRA
Michael Coplen	FRA
Marco daSilva	John A. Volpe National Transportation Systems Center (Volpe Center)
Tim Davis	Massachusetts Bay Transportation Authority
Rick Deichmann	Norfolk Southern Railway Police, St. Louis
Frank Frey	FRA
Lou Frangella	FRA
Daren Gilbert	California Public Utilities Commission
Brian Gilleran	FRA
Ryan Gustin	CSX Transportation
Bill Grizard	American Public Transportation Association
Michail Grizkewitsch	FRA
Charles Hagood	FRA
Steve Laffey	Illinois Commerce Commission
Craig S. Macdonald	Metro Transit, St. Louis
Mike Martino	Association of American Railroads
Levern McElveen	FTA
Tarek Omar	FRA
Jewel Pickett	Amtrak
Jerry Powers	FTA
Brian A. Schaffer	BNSF Railway
Shel Senek	Ohio Operation Lifesaver
John Simpson	UP
Monica Shaw	FRA
Helen Sramek	Operation Lifesaver
Richard Washington	FRA

Mr. Leonard Allen, Chief, Systems Safety and Engineering Division, U.S. DOT Research and Innovative Technology Administration (RITA) John A. Volpe National Transportation Systems Center (Volpe Center), provided managerial direction and support for the workshop. Mr. Marco

daSilva, Highway-Rail Grade Crossing and Trespass Research Program Manager, Systems Safety and Engineering Division, Volpe Center, provided overall direction for the workshop. Mr. James Harrison, Volpe Center, provided project management and implementation oversight. Thanks to the team facilitators from the Volpe Center's onsite contractor: Ms. Ingrid Bartinique, Mr. Josh Hassol, Mr. Andy Lehrer, Mr. Larry Raskin, Mr. Dicky Waldron, and Ms. Carol Yelverton.

The authors also wish to thank and acknowledge the contributions of all participants for their part in the successful development of new or expanded initiatives, strategies, programs, and new research projects.

Executive Summary

From August 14 to August 16, 2012, the U.S. Department of Transportation (U.S. DOT) Research and Innovative Technology Administration's (RITA) John A. Volpe National Transportation Systems Center (Volpe Center) hosted the jointly sponsored U.S. DOT Federal Railroad Administration (FRA)/Federal Transit Administration (FTA) 2012 Right-of-Way (ROW) Fatality and Trespass Prevention Workshop.

FRA and FTA sponsored the first ROW Fatality and Trespass Prevention Workshop in 2008 in San Carlos, CA. This workshop brought together multiple rail constituents, including transit, freight, and commuter rail, to evaluate common problems and solutions surrounding ROW fatality and trespass prevention, which has become a major risk mitigation area facing the rail community.

The August 2012 FRA/FTA ROW Fatality and Trespass Prevention Workshop built on the success of the 2008 workshop.

The purpose of the workshop was twofold:

1. Provide FRA, FTA, and key stakeholders with an update of current and future activities in the areas of ROW fatality and trespass prevention.
2. Solicit new ideas from the workshop attendees on prospective new or expanded initiatives, strategies, programs, and research projects.

These goals were achieved by bringing together subject matter experts (SME) to share information, collaborate, identify, and prioritize specific recommended actions related to education, engineering, and enforcement (Three Es) to facilitate the reduction of railroad and transit ROW trespass incidents and fatalities.

To assist with the structure and direction of the workshop, a Steering Committee made up of leaders of various U.S. DOT agencies and their key partnering organizations (both public and private) was nominated by FRA/FTA to address different perspectives of highway-rail grade crossing safety and trespass prevention.

The Steering Committee developed the technical agenda, including the identification of six topic areas, identified appropriate speakers, and actively participated in the execution of the workshop. The topic areas were as follows:

- Pedestrian Safety Issues
- Hazard Management
- Design, Technology, and Infrastructure
- Community Outreach
- Enforcement
- Intentional Deaths/Acts

A total of 174 representatives participated as delegates at the 2½-day workshop. They included Federal, State, and local governments, as well as railroads, transit agencies, enforcement (railroad and nonrailroad), academia, nongovernmental organizations, and consultants. Additionally, there were international participants from Canada.

The workshop commenced with a keynote address delivered by Mr. Joseph C. Szabo, FRA Administrator. On behalf of President Barack Obama and U.S. DOT Secretary Ray LaHood, he thanked participants for their dedication to saving lives and making communities safer. For the full keynote address, see link below:
http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Opening%20Session/FRA%20Administrator%20Joesph%20Szabo%20Keynote%20Address.pdf

On the first day, speakers made presentations on the first three of the six research areas identified by the Steering Committee: Session 1, Pedestrian Safety Issues; Session 2, Hazard Management; and Session 3, Design, Technology, and Infrastructure. Eleven presentations covering these three topic areas were delivered.

During the second day of the workshop, the remaining three topic areas—Community Outreach, Enforcement, and Intentional Deaths/Acts—were covered in 12 presentations.

The second day also concluded with six working group breakout sessions. The working groups were asked to come up with ideas that could include new or expanded initiatives, and strategies and programs, in addition to new research projects.

The working groups were asked by the workshop steering committee to "think out of the box" and aim for outcomes based on:

- Consideration of alternatives on the basis of public interest;
- Focusing on ideas that are not necessarily based on current conventions or standards; needs, perceptions, and potential is more important than existing conventions;
- Consideration of possible research projects with different procedures, innovative technologies, new participants, and changed responsibilities.

One hundred seventy-four delegates developed more than 90 research ideas during the 6 breakout sessions. Each group then identified the top potential project ideas for its research-needs area. Each proposal was discussed and placed on flip charts. Each group was then tasked with identifying its top three to five project proposals. This vetting process resulted in the identification of the top 23 research needs out of more than 90 suggestions that were presented to the entire group in the "Working Group Summaries of Top Research Needs" on August 16.

Table 1 lists the 23 research needs identified. More detailed information on each research need is contained in Section 2 of this report.

Table 1. Top 23 Research Needs Developed

TOPIC AREA	ACTION	TITLE
1. Pedestrian Safety Issues—Green Team	1	Data collection and analysis
	2	Engineering design
	3	Distracted behavior—pedestrians and cyclists
	4	Lack of standard signage and evaluation of effectiveness of each type
2. Hazard Management—Red Team	1	Safety culture
	2	Data collection
	3	Define hazard management
3. Design, Technology, and Infrastructure—Yellow Team	1	Fencing design and utilization
	2	Barriers designed to mitigate pedestrian distraction
	3	Exploratory technology research and education
	4	Train-activated in-pavement lights
4. Community Outreach—Orange Team	1	Public awareness campaign
	2	Community outreach partnerships
	3	National Community Awareness Day
	4	Outreach and awareness toolkit
5. Enforcement—Blue Team	1	Seek full police authority, across all 50 States, for railroad police officers
	2	Develop specific railroad/transit trespass law that can be applied broadly across the United States (consistent language)
	3	(a) Focus on "high value" targets, i.e., trespassers with malicious intent, homeless, drug/alcohol, other; (b) Strategies for different types of trespassers—casual, impaired, malicious
	4	Strive to have "crucial conversations" with local courts and prosecutors to prioritize trespass
	5	Seek opportunities to apply for and/or develop law enforcement grants that can target trespass cases
6. Intentional Deaths/Acts—Purple Team	1	Education
	2	Eliminating trigger terminology from public communication
	3	Exploration of trespass prevention messaging

Additional potential actions were brainstormed and discussed, but did not meet the criteria for inclusion in the top three to five recommendations. Although those potential actions did not make the short list, they provided some indication of the full spectrum of issues being considered.

FRA and FTA are hopeful that the results of this workshop will be used by U.S. DOT modal administrations and their stakeholders to enhance safety on the Nation's rail transportation network.

Based on evaluations and comments made during the sessions, the overwhelming consensus was that the workshop was a success. A total of 59 out of the 174 total attendees (34 percent) responded to the electronic survey (included in Appendix B) which was issued after the workshop. The results were as follows:

- More than 90 percent very or extremely satisfied with registration process, presentations, and session structure.
- 58 percent very or extremely satisfied with breakout session/discussion; most feedback noted insufficient time for that activity.
- 100 percent very or extremely satisfied with workshop staff.
- 90 percent very or extremely satisfied with conference location and facilities.
- 95 percent very or extremely satisfied with overall quality of the workshop.
- 95 percent responded yes to "workshop met your expectations."
- 83 percent recommended that these types of workshops be held at least every 2 years (30.5 percent every year, 52.5 percent every 2 years).

In order to keep the momentum going and continue the exchanging of ideas until the next workshop, a Web site and social media pages were set up to facilitate ongoing conversations:

> Participants were able to join in conversation before, during, and after the event on Twitter by using hashtag #ROW2012—FRA uses hashtag #ROW2012 for posts related to the conference. Those following FRA on Twitter, at twitter.com/USDOTFRA, can view these posts, retweet, and communicate directly with FRA on Twitter regarding any questions or comments. Pictures from the workshop are posted on FRA's Facebook page, facebook.com/USDOTFRA.

Presentations and ancillary documents from the workshop are posted at http://www.fra.dot.gov/conference/trespass2012/summary.shtml.

1. Introduction

Trespassing along railroad and transit rights-of-way (ROW) is the leading cause of rail-related deaths in America. Nationally, more than 400 trespass fatalities and nearly as many injuries occur each year. The vast majority of these events are preventable. In general, most trespassers are pedestrians who use railroad tracks as a shortcut.

This problem is by no means new. In 2008, FRA and FTA sponsored the first ROW Fatality and Trespass Prevention Workshop. This workshop was the first to bring together multiple rail constituents from transit, freight, and commuter rail to focus on common problems and solutions surrounding ROW fatality and trespass prevention. It was attended by 121 delegates from various organizations and government agencies. To view the presentations of the 2008 conference, go to http://www.fra.dot.gov/eLib/Details/L04235.

Based on the success of the 2008 ROW Fatality and Trespass Prevention Workshop, the U.S. DOT FRA and FTA sponsored a second national workshop August 14–16, 2012, in St. Louis, MO.

Figure 1. Workshop in Action

As with the 2008 conference, this workshop consisted of a varied program presented by rail and transit experts and other safety professionals who shared their ideas on key issues, best practices, technical developments, human behavior, law enforcement, and public education and awareness outreach methods and techniques related to trespass prevention. The workshop allowed the 174 attendees (representing Federal, State, and local governments, freight and passenger railroads, transit agencies, labor unions, academia, nonprofit organizations, and consultants) to learn about and discuss advances, accomplishments, challenges, and approaches related to ROW fatality and trespass prevention. The result was an open exchange of ideas, an opportunity to network with peers, a showcase of the newest and best safety-related applications, and discussion of future recommended actions. The workshop concluded with the development of a list by the participants of 23 high-priority recommended actions across six topic areas: Pedestrian Safety Issues; Hazard Management; Design, Technology, and Infrastructure; Community Outreach, Enforcement; and Intentional Deaths/Acts.

The first 2 days of the workshop included presentations by representatives of various organizations on railroad and transit ROW trespass issues corresponding to the six topic areas identified above. Participants were asked to save their questions and comments for the question and answer (Q&A) opportunity on Thursday after all of the working group recommendations were presented.

Near the end of day two, six working group breakout sessions were held. The breakout sessions identified potential new or expanded initiatives, strategies, and programs across the range of topic areas to facilitate the reduction of ROW trespass incidents and fatalities. An example of participant deliberations on recommended actions is shown in Figure 2.

Figure 2. Working Group in Action

Day three consisted of a working group session report based on the research needs topics developed, a summary presentation, and a Q&A period.

This report documents the purpose, process, analyses, and results of the workshop. Additional, supporting information on the workshop agenda, discussions, presentations, correspondence, and forms can be found at http://www.fra.dot.gov/conference/trespass2012/index.shtml.

1.1 Project Objectives

The purpose of the workshop was twofold:

1. Provide FRA, FTA, and key stakeholders with a status update on current and future activities in the areas of ROW fatality and trespass prevention.
2. Solicit the workshop attendees' ideas on prospective future action and research priorities.

These goals were achieved by bringing together SMEs to share information, collaborate, identify, and prioritize specific recommended actions related to education, engineering, and enforcement of policies to reduce ROW trespass incidents and fatalities.

1.2 Workshop Planning and Preparation

To assist with the structure and direction of the workshop, a Steering Committee made up of a diverse group of experts was nominated by FRA/FTA to address different perspectives of highway-rail grade crossing safety and trespass prevention. Members of the Steering Committee included leaders of various U.S. DOT agencies and their key partnering organizations (both public and private), as indicated in Table 2.

Table 2. Steering Committee Members

Name	Agency/Organization
Dale Bray	Union Pacific Railroad (UP)
Debra Chappell	FRA
Michael Coplen	FRA
Marco daSilva	Volpe Center
Tim Davis	Massachusetts Bay Transportation Authority (MBTA)
Rick Deichmann	Norfolk Southern Railway (NS) Police, St. Louis
Frank Frey	FRA
Lou Frangella	FRA
Daren Gilbert	California Public Utilities Commission (CPUC)
Brian Gilleran	FRA
Ryan Gustin	CSX Transportation (CSX)

Bill Grizard	American Public Transportation Association (APTA)
Michail Grizkewitsch	FRA
Charles Hagood	FRA
Steve Laffey	Illinois Commerce Commission
Craig S. Macdonald	Metro Transit, St. Louis
Mike Martino	Association of American Railroads (AAR)
Levern McElveen	FTA
Tarek Omar	FRA
Jewel Pickett	Amtrak
Jerry Powers	FTA
Brian A. Schaffer	BNSF
Shel Senek	Ohio Operation Lifesaver
John Simpson	UP
Monica Shaw	FRA
Helen Sramek	Operation Lifesaver
Richard Washington	FRA

The Steering Committee's goal for this workshop was to bring together a wide range of views from a diverse pool of experts that included Federal researchers, representatives of highway safety, law enforcement, rail and transit industry, management and labor, academia, and consultants. They were asked to aim for outcomes based on:

- Consideration of alternatives on the basis of public interest;
- Focusing on ideas that are not necessarily based on current conventions or standards; needs, perceptions, and potential is more important than existing conventions.
- Consideration of possible research projects with different procedures, innovative technologies, new participants, and changed responsibilities.

The committee identified the following six topical or research needs areas:

Pedestrian Safety Issues (Green Team)

This research-need area required a review and analysis of current intersection planning and design parameters, active and passive warning signage treatment, intuitive pathway channeling, and cognitive danger recognition. It also involved identifying specific treatments at high-density pedestrian crossings (e.g., near station platforms) with second-train potential and evaluating methods to counteract inappropriate pedestrian behaviors. The research in this area will facilitate standardization of pedestrian at-grade crossing efforts nationwide, with the goal of reversing the upward trend in pedestrian fatalities.

Hazard Management (Red Team)

This panel session was designed to examine hazards along the railroad ROW and evaluate the hazard management process. The hazard management process defines the physical and functional characteristics of the system and evaluates the key components, which include the following: people, rules, and procedures; facilities and equipment; and the operating environment. It is from this process that the appropriate mitigation measures are developed and implemented.

Design, Technology, and Infrastructure (Yellow Team)

This session presented topics specifically related to engineering activities, successes, and challenges with respect to fatalities and trespassing along railroad ROWs.

Community Outreach (Orange Team)

This session presented some community outreach initiatives and programs currently practiced nationwide, as well as current best practices. The session also provided a blueprint for organizing a successful community coalition.

Enforcement (Blue Team)

This session presented a number of safety and security initiatives that are currently in place and being effectively implemented to identify, apprehend, prosecute, and track trespassers along railroad ROW. This session sought to provide participants with information that could be "taken home" and put into practice, potentially resulting in a reduction of trespasser incidents nationwide.

Intentional Deaths/Acts (Purple Team)

This session looked at current practices and research studies intended to mitigate or eliminate intentional death acts on the Nation's railroad ROWs. Through shared risk identification, statistical analysis, mapping high-risk areas, and development of future prevention strategies and methods to gauge their success, the session provided attendees the opportunity to discuss current industry and public practices aimed at the prevention of intentional deaths.

To facilitate the various session goals, each workshop attendee was assigned to one of the six working groups. At conference registration, each attendee was asked to select up to three preferred working groups. Even though some adjustments were made to keep the groups balanced, all attendees were assigned to one of the three groups they had selected. Each group was staffed with the working group moderator and a seasoned facilitator provided by the Volpe Center.

The Steering Committee next designated six topic area leaders (one to each research-needs area) to moderate the technical sessions and direct delegates in the analysis and discussion of the research needs provided for each of the six working groups. These leaders are listed in Table 3. The Steering Committee nominated 23 speakers and presenters to provide up-to-date research information and research progress on the six topic areas detailed in Table 4.

The breakout groups were assembled with the following in mind: attendee preference, size, and a representative mix of participants from different modes, roles, and responsibilities. This formula was designed to stimulate as much discussion as possible, as well as facilitate cross-disciplinary and cross-modal sharing of ideas.

Table 3. Workshop Research Needs Areas

Topic Areas	Team Leader	Organization
Pedestrian Safey Issues—Green Team	William P. Grizard	APTA
Hazard Management—Red Team	Levern McElveen, Frank Frey	FTA, FRA respectively
Design, Technology, and Infrastructure—Yellow Team	Debra Chappell, Frank Frey	FRA
Community Outreach—Orange Team	Kevin Dawson	UP
Enforcement—Blue Team	Ryan Gustin	CSX
Intentional Deaths/Acts—Purple Team	Charles Hagood	FRA

Table 4. Workshop Speakers

TOPIC AREA	SPEAKER	TITLE	ORGANIZATION
1. Pedestrian Safety Issues—Green Team	Ron Nickle	Chief Safety Officer	MBTA
	Sheree Davis	Manager Bureau of Commuter and Mobility Strategies	NJ DOT
	Carolyn Cook	Senior Crossing and Trespass Prevention Regional Manager	FRA
2. Hazard Management—Red Team	Daren Gilbert	Program Manager, Rail Transit and Crossings Branch	CPUC
	Marco daSilva	General Engineer/Program Manager	Volpe Center
	James Fox	Director, System Safety and Risk Management	SEPTA
	Richard Ferlauto	ROW Taskforce Manager	LIRR

TOPIC AREA	SPEAKER	TITLE	ORGANIZATION
3. Design, Technology and Infrastructure—Yellow Team	Brent Ogden Don Sepulveda	Vice President CEO, Regional Rail for Los Angeles County Metropolitan Transportation Authority (LACMTA)	AECOM LACMTA
	Kurt Wilkinson	Manager, Safety Risk Assessment, Construction Safety	TriMet
	Peggy Lyda	Manager, Public Safety	UP
4. Community Outreach—Orange Team	Jay Holman John Simpson	Police Public Safety Officer Senior Manager, Grade Crossing Compliance	UP
	Lou Frangella	Grade Crossing/Trespasser Regional Manager	FRA
	Bill Barringer	Director, Grade Crossing Safety	NS
	Richard Washington	Region 5 Grade Crossing Manager	FRA
5. Enforcement—Blue Team	Shel Senek	Lieutenant Colonel	Ohio State Patrol (retired)
	Captain Gary Jones	Commander	Amtrak Police
	Bryan Madden Rick Deichmann	Deputy Chief/Homeland Security Special Agent	BNSF
6. Intentional Deaths/Acts—Purple Team	Dr. Linda Langford	Evaluation Scientist	Suicide Prevention Resource Center
	Mike Martino	Senior Director of Operations	AAR
	Louis Brown	Assistant Chief Safety Officer	WMATA

To ensure positive participation and feedback, the Steering Committee capped workshop registration at 200 participants, out of which 174 attended.

Table 5 illustrates the range of participants from Federal, State, and local governments, as well as railroads, transit agencies, labor unions, academia, nonprofit organizations, consultants, and international ministries.

The topic area presentations were made to the entire group on days one and two. Near the end of day two, the breakout groups assembled to come up with three to five recommendations concerning new or expanded initiatives and strategies. The idea was to get any and all thoughts up on flipcharts. Then, voting took place as the attendees went up to the flipcharts and placed one of the five adhesive dots provided to them next to the potential recommendations of their choice.

To retain ideas that did not make the vote but still provided some insight into the topic in question, the group was asked to assemble a list of all recommendations. These were recorded in a list of actions that were discussed but not selected.

The discussion and comment period from the final session on Thursday, August 16 is documented in "Working Group Summaries of Top Research Needs" (link provided in Section 1.3).

Table 6 shows the number of participants assigned to each of the workshop working groups. The working groups developed a total of 90 research problems. Each group was then tasked with identifying the top five projects for their respective research needs area. This vetting process resulted in the identification of 23 top needs.

Table 5. Distribution of Participants by Organizational Type

Organization Type	Number of Delegates
Federal Government	23
Highway Agencies	19
Railroads	44
Transit Agencies	27
Industry	7
Consultants	12
Enforcement—Railroads	12
Enforcement—General	8
University/Academia	2
Legal	1
Non-Government Organizations	8
Volpe Center Onsite Contractor Staff	6
Private Citizens	1
International	4
Total	**174**

Table 6. Distribution of Participants by Topic Area

Topic Area	Number of Participants
Pedestrian Safety Issues—Green Team	33
Hazard Management—Red Team	34
Design, Technology, and Infrastructure—Yellow Team	38
Community Outreach—Orange Team	28
Enforcement—Blue Team	22
Intentional Deaths/Acts—Purple Team	29

1.3 Organization and Conduct of Workshop

The agenda is outlined below. Presentations are not published in this report but are hyperlinked below for convenience. Here is the home page for all materials posted: http://www.fra.dot.gov/conference/trespass2012/index.shtml.

Day One

Welcome Addresses

- John M. Nations, CEO, Metro St. Louis
- Mahktee Ahmad, FTA Region VII Administrator, FRA

Keynote Address: Joseph Szabo, FRA Administrator
http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Opening%20Session/FRA%20Administrator%20Joesph%20Szabo%20Keynote%20Address.pdf

General Addresses

- Ronald Ries, FRA
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Opening%20Session/Ron%20Ries%20-%20Trespassing%20Issues%20that%20Face%20The%20Nation%20-%20FRA.pdf
- Levern McElveen, FTA, *Trespassing Issues that Face the Nation*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Opening%20Session/Levern%20McElveen%20-%20Trespassing%20Issues%20%20that%20Face%20the%20Nation%20-%20FTA.pdf

SESSION 1: Pedestrian Issues, Green Team

Moderator: William P. Grizard, APTA

- Ron Nickle, MBTA—*A System Safety Approach to Grade Crossing Management Planning for Pedestrians*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%201%20Pedestrain%20Safety%20Issues/Ron%20Nickle%20-%20A%20System%20Safety%20Approach%20to%20Grade%20Crossing%20Pedestrian%20Treatments.pdf

- Sheree Davis, NJDOT—*New Jersey Safety along Railroads, Actions*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%201%20Pedestrain%20Safety%20Issues/Sheree%20Davis%20-%20New%20Jersey%20Safety%20Along%20Railroads%20Action%20Plan.pdf
- Carolyn Cook, FRA—*Pedestrian Safety at Passenger Stations*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%201%20Pedestrain%20Safety%20Issues/Carolyn%20Cook%20-%20Pedestrain%20Safety%20at%20Passengers%20Stations.pdf

SESSION 2: Hazard Management, Red Team

Moderator: Levern McElveen, FTA; Frank Frey, FRA

- Daren Gilbert, CPUC—*Regulator Approach: 49 CFR 659*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%202%20Hazard%20Management/Daren%20Gilbert%20-%20Regulator%20Approach%2049%20CFR%20659.pdf
- Marco daSilva, Volpe—*FRA Funded Research: FL DOT and Tri-Rail Study*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%202%20Hazard%20Management/Daren%20Gilbert%20-%20Regulator%20Approach%2049%20CFR%20659.pdf
- James Fox, SEPTA—*Hazard Management Experiences: SEPTA*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%202%20Hazard%20Management/James%20Fox%20-%20SEPTA%20Hazard%20Managment%20Experiences.pdf
- Richard A. Ferlauto, Long Island Rail Road (LIRR)—*High Fences Risk Analysis and Methodology*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%202%20Hazard%20Management/Richard%20Ferlauto%20-%20High%20Fences%20Risk%20Analysis%20and%20Methodollgy.pdf

SESSION 3: Design, Technology, and Infrastructure, Yellow Team

Moderators: Debra Chappell, FRA; Frank Frey, FRA

- Brent Ogden, AECOM—*Engineering Trespassers Out of Rail Corridors*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%203%20Design,%20Technology,%20and%20Infrastructure/Brent%20Ogden%20-%20Engineering%20Trespassers%20out%20of%20Rail%20Corridors.pdf
- Don Sepulveda, LACMTA—*Design for Safety*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%203%20Design,%20Technology,%20and%20Infrastructure/Don%20Sepulveda%20-%20Design%20for%20Safety.pdf
- Kurt Wilkinson, TriMet—*Design Features to Mitigate Trespassing*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%203%20Design,%20Technology,%20and%20Infrastructure/Don%20Sepulveda%20-%20Design%20for%20Safety.pdf
- Peggy Lyda, UP—*Fresno Trespass Campaign*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%203%20Design,%20Technology,%20and%20Infrastructure/Peggy%20Lyda%20-%20Fresno%20Trespass%20Campaign.pdf

Day Two

SESSION 4: Community Outreach, Orange Team

Moderator: Kevin Dawson, UP

- Jay Holman and John Simpson, UP—*Community Coalition Focus Plans*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%204%20Community%20Outreach/Jay%20Holman-John%20Simpson%20-%20Community%20Coalotion%20Focus%20Plans.pdf

- Lou Frangella, FRA—*Successful Community Outreach Programs*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%204%20Community%20Outreach/Lou%20Frangella%20-%20Successful%20Community%20Outreach%20Programs.pdf
- Bill Barringer, NS—*Train Your Brain NS Safety Campaign*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%204%20Community%20Outreach/Bill%20Barringer%20-%20Train%20your%20Brain.pdf
- Richard Washington, FRA—*National Trespass Programs*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%204%20Community%20Outreach/Richard%20Washington%20-%20National%20Trespass%20Program.pdf

SESSION 5: Enforcement, Blue Team

Moderator: Ryan Gustin, CSX

- Shel Senek, Ohio State Patrol (retired)—*Trespass Enforcement and Incident Program*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%205%20Enforcement/Shel%20Senek%20-%20Trespass%20Enforcement%20and%20Incident%20Program.pdf
- Gary Jones, Amtrak Police—*Passenger Rail Trespassing Concerns: Insights from Amtrak Police*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%205%20Enforcement/Gary%20Jones%20-%20Insights%20from%20Amtrak%20Police.pdf
- Bryan Madden, BNSF—*Citizens for Rail Security*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%205%20Enforcement/Bryan%20Madden%20-%20Citzens%20for%20Rail%20Security.pdf
- Rick Deichmann, NS Police —*Protect the Line*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%205%20Enforcement/Rick%20Deichmann%20-%20Protect%20the%20Line.pdf

SESSION 6: Intentional Deaths/Acts

Moderator: Charlie Hagood, FRA

- Dr. Linda Langford, Suicide Prevention Resource Center, EDS, Inc.
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%206%20Intentional%20Deaths-Acts/Linda%20Langford%20-%20Resources%20for%20Suicide%20Prevention.pdf
- Scott Gabree, Volpe—*Nationwide Database to Track Trespass and Suicides*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%206%20Intentional%20Deaths-Acts/Scott%20Gabree%20-%20Current%20and%20Future%20Directions.pdf
- Mike Martino, AAR—*Countermeasures to Reduce Suicides on Railroad Rights of Way*
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%206%20Intentional%20Deaths-Acts/Mike%20Martino%20-%20Countermeasures%20to%20Reduce%20Suicdes%20on%20ROWs.pdf
- Louis Brown, WMATA—Suicide Prevention Program
  http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Session%206%20Intentional%20Deaths-Acts/Louis%20Brown%20WMATA%20Suicide%20Prevention%20Program.pdf

Organization of Working Groups/Introduction of Teams

http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Break%20Out%20Groups/Breakout%20Group%20Briefing.pdf

Working Group Breakout Sessions

Day Three

Working Group Summaries of Top Research Needs

http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Break%20Out%20Groups/Top%205%20Project%20Summary%20Presentation.pdf

Final Thoughts and Workshop Closeout

1.4 Opening Addresses

The keynote speech was delivered by FRA Administrator Joseph C. Szabo, as shown in Figure 3. Mr. Szabo provided words of both encouragement and urgency by emphasizing the fact that ROW trespassers account for the largest number of rail-related casualties—approximately 500 incidents per year. He applauded the key people gathered in the conference room who combat ROW trespassing, commending them for their willingness to devote 3 days to learning, sharing, and making their voices heard.

Figure 3. Remarks by FRA Administrator Szabo.
"At the FRA, safety is more than our highest priority—we live and breathe it."

Administrator Szabo described several FRA-sponsored trespass prevention research activities currently underway. Highlights of his speech included:

- Evaluating a trespass program on Tri-Rail/Florida East Coast Railway (FEC) ROWs for developing a set of national recommendations for trespass prevention. This program—based on work previously performed by Transport Canada—is called the Community, Analysis, Response, and Evaluation (CARE) Guide. The approach embodied in CARE

facilitates the identification of stakeholders in one's locality and allows for analysis that can aid in enhancing response, planning, and evaluation.

- Much clearer data based on geographic information is helping identify high-risk zones, and enabling communities to implement better mitigation strategies, engineering reviews, educational outreach, and targeted enforcement. Demographic data is allowing for the formulation of better-targeted outreach campaigns.

- FRA will continue working with freight and passenger railroads, labor organizations, OL, and other stakeholders to deliver the safety message to diverse audiences as well. The importance of these efforts is underscored by the projected population increases that will entail four billion more annual tons of freight over the next several decades. A key goal of this workshop was to make trespassing socially unacceptable and to press the point that any time people trespass, they are risking their lives.

For the full keynote address, go to:
http://www.fra.dot.gov/conference/trespass2012/pdf/Presentations/Opening%20Session/FRA%20Administrator%20Joesph%20Szabo%20Keynote%20Address.pdf

Highlights of Welcome Addresses

- John Nations—CEO, Metro St. Louis. "We consider our success to be not just when a passenger is delivered to a destination, but when one is transported safely. For that reason, we require an 8-hour training session for ROW workers, annual refresher training for our employees, and procedures are in place for vehicle operators to report trespasses. We have a State Safety Oversight (SSO) program to help identify and mitigate problems where trespassing occurs. We are working on pedestrian crossing as well and cooperate closely with Operation Lifesaver. Metro St. Louis welcomes you!

- Moktee Ahmad—FTA Region VII Administrator. "Trespassing is one of FTA's greatest concerns, as it results in the largest numbers of fatalities. The 'Three Es'—Education, Engineering, and Enforcement—all come into play to mitigate this. FTA is looking forward to implementing provisions of MAP-21, commencing in October 2012. This will allow FTA to set minimum safety standards as well as conduct investigations and provide guidance for new starts and modifications to existing systems.

Highlights of General Addresses

Key points included the following:

- FTA
  - Trespassing is the largest cause of fatalities by far (excluding suicides), and it is increasing. Other causes such as pedestrians, motorists, slip and falls, and

operating rules/environments account for a much lesser percentage than the 42 percent attributed to trespassing.
    - Mitigation strategies must include the Three Es (Engineering, Education, and Enforcement).
    - Each of the Three Es requires internal and external actions and outreach.
    - Safety culture in organizations must be from the top down and bottom up.

- FRA
    - Trespassing is done by folks of all ages.
    - It is a 24/7 problem throughout the year.
    - Trespassing happens at various locations including bridges, universities, and youth recreation centers.
    - Most trespassing occurs directly on the tracks, not alongside, beside, or between tracks.
    - We are here to H.E.L.P.—**H**ear with an open mind, **E**valuate what you hear, **L**earn from others, and **P**articipate fully.

2. Identification of Top Research Needs

On the second day of the workshop, attendees broke out into working groups.

The purpose of the working groups was to:

- Provide FRA, FTA, and all workshop stakeholders with a current status of activities and research in the area of railroad ROW trespasser incidents and fatalities.
- Formulate, by intermodal and stakeholder consensus, an updated set of initiatives, strategies, programs, and research.
- Prepare these needs in a prioritized action item format, including appropriate modal administration roles, where applicable.

2.1 Working Group Top Research Needs

The general format for the working groups consisted of a 2-hour block of time, directed by the team leader or moderator, with discussion facilitated by support staff. The groups were asked to brainstorm initiatives, strategies, programs, and research projects. The group was then charged with prioritizing the recommendations the moderator could report back to the general session on the last day.

The brainstorming process produced many great ideas that were then discussed, vetted, and consolidated into a formal list of ideas. One group reported that they had as many as 70 original brainstorming ideas that were eventually consolidated into 24 research categories. The groups then conducted a vote to yield three to five research needs. This vetting process resulted in the identification of the top 23 research needs out of more than 90 suggestions across the six topic areas. Table 7 shows the resultant distribution of the 23 research needs categorized by topic area. In the closing session, the moderator for each group presented these top needs to all workshop delegates.

Table 7. Distribution of the Top 23 Research Needs by Topic Area

Topic Area	Number of Top Research Needs
Pedestrian Safety Issues—Green Team	4
Hazard Management—Red Team	3
Design, Technology, and Infrastructure—Yellow Team	4
Community Outreach—Orange Team	4
Enforcement—Blue Team	5
Intentional Deaths/Acts—Purple Team	3

Below are the top observations and recommendations developed by each working group:

Pedestrian Safety Issues

1. *Data Collection and Analysis:* Lack of centralized data collection; limited access to data from partners and stakeholders; different interpretation of data; inconsistent definition of incident types/data submission; different reporting criteria for different agencies; innovations not being systematically analyzed to determine effectiveness.

2. *Engineering Design for Pedestrian Safety:* Providing an engineering design manual that offers practical cost effective engineering design solutions that will enable railroads to mitigate pedestrian crossing hazards during preliminary design, but more importantly, before revenue service commences.

3. *Distracted Behavior–Pedestrians and Cyclists:* Distractions, such as electronic devices, clothing, reading material, and consumption of alcohol, drugs, or food and beverage that cause crossing users to be oblivious to the railroad environment, creating a hazard. The distracted behavior results in near misses, walking into trains, injuries, and fatalities.

4. *Standardize Active/Passive Signage and Evaluate Effectiveness:* A standard list of effective active and passive signage for transit, heavy rail, passenger service, and freight would be of benefit. In our mobile society, the traveling public will receive the same message regardless of location.

Hazard Management

1. *Safety Culture:* Elevate safety within organizational culture (incorporate safety into roles and responsibilities). Develop a model training program for implementing new safety protocols.

2. *Data Collection:* Develop best practices (data quality, aggregate versus disaggregate data, near-miss reporting, what technology is effective).

3. *Hazard Management:* Develop common definition, interpretation, and application. Develop a formal committee (Transit Rail Advisory Committee for Safety or Railroad Safety Advisory Committee).

Design, Technology and Infrastructure

1. *Fencing Design:* Establish robust, standardized fencing design and engineering criteria to inform local decisionmaking.

2. *Barriers Designed to Mitigate Pedestrian Distraction:* Allow railroad preemption to lock the mechanism against entry upon train detection.

3. *Exploratory Technology Research and Education:* Apply existing technologies from other industries to rail ROW.

4. *Train-Activated In-Pavement Warning Lights:* Lights would activate as train approaches to provide additional warning to pedestrians.

Community Outreach

1. *Public Awareness Campaign:* Make deliberate, sustained connections within communities. Take an overarching approach to preventing injury and death that can be customized for specific demographic, cultural, and regional audiences. Create a brand or slogan that is distinctive and memorable. Encourage collaborative, proactive teaming of Federal and local government and industry, bringing stakeholders into the process.

2. *Community Outreach Partnerships:* Develop a national initiative that invites community stakeholders to be a part of developing and implementing a trespassing reduction program.

3. *National Community Awareness Day:* Implement a railroad trespasser prevention awareness day.

4. *Outreach and Awareness Toolkit:* Offer communications resources providing local relevance addressing ongoing issues and providing a means to problem solve.

Enforcement

1. *Railroad Police Authority:* Seek full police authority across all 50 States for railroad police officers.

2. *Broad-Based Trespass Law:* Develop a railroad-specific trespass law that can be applied broadly across the United States (consistent language).

3. *Strategic Approach to Different Types of Trespassers:* Focus on 'high value' targets (i.e., approach for trespassers with malicious intent, homeless, drug or alcohol (impaired) should be different from approach for the casual trespasser).

4. *Crucial Conversations with the Judicial System:* Have "crucial conversations" with your local courts and prosecutors to encourage consistent enforcement of trespass laws for violators.

5. *Law Enforcement Grants for Trespass Enforcement/Abatement:* Seek opportunities to apply for and/or develop law enforcement grants that target rail ROW trespass behavior.

Intentional Deaths/Acts

1. *Education:* How can the message change behavior? How do you create a deterrent effect? How do you alter the societal mindset regarding illegal trespassing?

2. *Eliminating Trigger Terminology from Public Communication:* What terminology can or should be used in media, presentations, Web sites, and technical reports? Develop guidelines for terms to use that do not provide unintended triggers.

3. *Exploration of Trespass Prevention Messaging:* Develop campaign and marketing materials stating that not all strikes result in fatalities—mainly to discourage those thinking of using trains as their suicidal tools. Also, stop running campaigns stating that trespass will kill you.

2.2 Other Recommendations Discussed and Recorded at Breakout Sessions

The 23 recommendations were the top vote-getters, but other good ideas were also proposed for discussion. Those other ideas are presented in Table 8.

Table 8. Other Ideas/Recommendations Not Selected for the Top 23

TOPIC AREA	TITLE
1. Pedestrian Safety Issues—Green Team	Use of professionals for understanding of human behavior
	Behavior analysis: ask pedestrians
	Lack of public knowledge: more and better outreach to general public
	Practical standardized materials for public and passengers (beyond OLI handouts)
	Tweaking FRA requirements for pedestrian criteria in quiet zones
	Behavior-Based Action Plan: What makes it socially acceptable?
	Best practices for transit versus freight on planned development
	Development of funding sources to implement pedestrian mitigations (as done for grade crossings)
	Standardization of effective fencing practices and materials
2. Hazard Management—Red Team	Balance of Regulations (have FTA = FRA at Federal level)
	Communications/information sharing of lessons learned/best practices—need same/common definitions
	Resources allocation to assist with decisionmaking
	Engineer cab reporting clipboard by mileposts, use handheld devices, do more with technology such as “apps”
	Data: sensitivity, probability; no Federal pressure to assess or measure risk probability
	Ideal impossible? Value/cost of safety
	Documentation: What is the model? What is safety? Requirements for process: easy to report, collects, analyzes, management reporting, action
	Information sharing; more workshops, survey for best practices, modes, agencies, differences between types of carriers
	Funding for safety
	Politics for safety: need support/advocacy
	Resource allocation: new versus old funding sources
	Peer reviews/evaluations

TOPIC AREA	TITLE
	System improvement in planning
	Case studies: normalized for comparison, need data, near misses, using new technologies such as Facebook
	Use FTA Hazard Matrix, like in Seattle, which embodies priorities and formal processes
3. Design, Technology and Infrastructure—Yellow Team	Toolkit of standards for pedestrian crossings including guidance, recommended practices, design principles, diagnostic review, dynamic warning signs
	Drones for ROW monitoring
	Design—comprehensive access to ROW approach
	New gate technologies for trespass prevention including unique gate designs, pop-up wedges
	Web site for trespass prevention idea sharing
	Operator sleep detection
	Buy-in and programming technology by agencies
	Cell phone/ear bud override
	Enforce third-party property owner access restriction
	On-train airbags/auto deploy crash barriers
	Electromechanical gate locks
	Course modules: ROW protection
	TRB publications and sessions
	Operator cell phone/text detection
	Cost-sharing with rail companies
	Radar technologies
4. Community Outreach—Orange Team	Making trespassing socially unacceptable
5. Enforcment—Blue Team	Uniform crime reporting
	Physical and time accessibility
	National Trespass Database; include identification of jurisdictions
	Enforcement of agreements
	Trespass “blitzes”

TOPIC AREA	TITLE
	Community policing agreements/Memoranda of Understanding (MOU)
	Partnerships
	Technology innovation
	Accountability (leading to impairment)
	Nudge Theory (understanding of penalties)
	Adopt a crossing
	Permitting for special events
	Tracking debris hits
	Signage
	Making trespassing socially unacceptable
	Knowledge alone does not alter behavior
	Railroad alone cannot be held solely accountable
6. Intentional Deaths/Acts—Purple Team	Incentives to get local enforcement to enforce ROW trespasses
	Stimulate research—what dates
	Policy is justification for railroad call boxes general suicide actions; who pays and maintains, liabilities
	Encourage coordination
	Separation of passengers for rail (e.g., Dulles)
	Determining if people are on the track
	Majority of suicides on neighborhood rural railroad ROWs
	Community "see something, say something"
	Transit, adaptable to railroads
	Deterrence; Japanese model of changing behavior

2.3 Presentation of Final Results

On day three, the workshop moderators presented their findings from the previous day to the entire workshop during the Working Groups Summary of Top Research Needs session.

It needs to be noted that there were slight variations in the voting procedures, level of detail, and reports to the group. The moderator/facilitator team for each working group defined his or her individualized approach and strategies for garnering the requested information.

For each of the working groups, results were presented in the following sequence:

1. Team members with facilitators and moderators identified

2. Recommended actions table

3. Prioritized list of recommendations considered, but not selected

4. A list of the top five recommendations

5. For each recommendation (which is the working groups' deliverable to the workshop):
   a. Project identification
   b. Description
   c. Rationale
   d. Perceived benefits
   e. Key implementation issues

6. Working group presentation to the entire group during the Working Group Summary of Top Research Needs session

7. Highlights of open discussion when time permitted

It should be noted that the language presented in this subsection is as agreed upon by the workshop groups. Questions, comments, and responses are presented in this document in the subsection for each topic area titled "Discussion."

2.3.1 Pedestrian Safety Issues

This research-needs area required a review and analysis of current intersection planning and design parameters, active and passive warning signage treatment, and intuitive pathway channeling and cognitive danger recognition; identified specific treatments at high-density pedestrian crossings (e.g., near station platforms) with second train potential; and considered methods to counteract inappropriate pedestrian behaviors. Ideally, the research in this area would facilitate a common industry approach to standardization of pedestrian at-grade crossing efforts nationwide, with the goal of reversing the upward trend in pedestrian fatalities.

Table 9 identifies the participants in the Pedestrian Safety breakout group.

Table 9. Pedestrian Safety Issues Breakout Group

Name	**Agency/Organization**
Jean Claude Aurel	Denver Transit Partners
William Barringer	Norfolk Southern Railroad
Rahim Benekohal	University of Illinois
André Boyda	Boyda Law
Norman Carlson	Carlson Consulting International
Carolyn Cook	FRA
Francois Cournoyer	Transport Canada

Name	Agency/Organization
Sheree Davis	NJ DOT
Timothy Davis	MBTA
Dan Di Tota	Transport Canada
Dave Goeres	Utah Transit Authority
William Grizard	APTA, Moderator
Scott Grott	Metro Transit, St. Louis
John Hauer	UP Police Department
Joel Kirchner	UP
Hilary Konczal	Metra
John Leed	AAJ
Craig Macdonald	Metro Transit, St. Louis
Bryan Madden	BNSF Police
Derrick Mason	NS
Ronald Nickle	MBTA
David Peterson	UP
Jewel Pickett	Amtrak
Larry Raskin	Volpe Center, Facilitator
Mark Rowley	UP Police Department
Michael Stead	Illinois Commerce Commission
Phillip Thomas	Maryland Transit Administration
Jack Webb	J Webb & Associates, LLC
Suzanne Whitehead	Metro St. Louis
James Young	Transportation Resource Associates

Top Four Recommended Actions for Topic Area 1: Pedestrian Safety Issues

- **Project 1. Data Collection and Analysis**
- **Project 2. Engineering Design**
- **Project 3. Distracted Behavior—Pedestrians and Cyclists**
- **Project 4. Lack of Standard Signage (Active and Passive) and Evaluation of Effectiveness of Each Type**

Of the recommendations discussed and considered, four recommendations clearly stood out from the other ideas put forth during the breakout session. Three of the recommendations scored 11 votes and one scored 10. All the other ideas scored significantly less votes. All four recommendations are of equal importance, notwithstanding the order of presentation.
The discussion of the ideas that were not included in the formal set of recommendations points to an overarching need to do more. The group felt empowered, noted the commonality of the goals that exist between all stakeholders, and are inspired to work together.

Project 1: Data Collection and Analysis

- Description—Lack of centralized data collection; limited access to data from partners and stakeholders; different interpretation of data; inconsistent definition of incident types and data submission; different reporting criteria for different agencies; innovation not being analyzed for effectiveness.
- Rationale—Cannot manage what is not measured.
- Benefits—Need a basis for decisionmaking.
- Key Implementation Issues—Working group should be convened with all affected partners and stakeholders; maintain single depository for safety data collection and analysis; create MOUs and other indemnification to allow stakeholder access to database.

There is a need for uniform and consistent data to be available on an industry-wide basis that incorporates both transit and railroad stakeholder communities.

Project 2: Engineering Design for Pedestrian Safety

- Description—An engineering design manual that provides practical cost-effective engineering design solutions that will enable railroads to mitigate pedestrian crossing hazards during preliminary design, before revenue service commences.
- Rationale—Pedestrian safety needs to be given higher level of consideration in design discussions.
- Benefits—Reduction in claims against the agency, reduction in deaths and severe injuries, and standardization of mitigations.
- Key Implementation Issues—Consult existing APTA, AREMA, MUCTD, DOT, railroad, and Regional Transportation Authority engineering manuals and guidelines to extract pedestrian design criteria.

Pedestrian safety measures need to be factored into the design phase of new and upgraded facilities. The development of tools is recommended to support a diverse set of circumstances including urban and rural operations, as well as rail and freight.

Project 3: Distracted Behavior—Pedestrians and Cyclists

- Description—Distractions such as electronic devices, clothing, reading material, alcohol and drug, and food and beverage cause crossing users to be oblivious to the railroad environment, creating a hazard. The distracted behavior results in near misses, walking into trains, injuries and fatalities.
- Rationale—Develop nationwide campaign to describe the results of socially unacceptable behavior in a rail environment. Lobby for distracted pedestrian/biker regulations.
- Benefits—Short-term <5 years: lives saved and behavior is socially unacceptable; long-term >5 years: regulations nationwide.
- Key Implementation Issues—Urgent need for regulation and information to the public to reissue engineering manuals and guidelines to extract pedestrian design criteria to reduce the hazards they are causing with their behavior.

The importance of this issue is underscored by the ubiquity of mobile electronic devices such as cell phones. Who would have thought 20 years ago that a pedestrian would be

concentrating on writing a message on a mobile device while walking? Also, certain types of clothing such as sweatshirts with hoods may impede the ability to hear or see. Distractions also include reading, eating, or drinking beverages. There needs to be a nationwide campaign in the shorter term and the promulgation of regulations in the longer term.

Project 4: Standardize Active/Passive Signage and Evaluate Effectiveness

- Description—A standard list of effective active and passive signage for transit, heavy rail, passenger service, and freight rail would be of benefit so that in our mobile society the traveling public will receive the same message regardless of location.
- Rationale—Most signage standards are geared toward vehicles, with standard pedestrian signage lacking.
- Benefits—Standard signage that is consistent throughout the United States, so as to eliminate confusion and language barriers to understanding the messages.
- Key Implementation Issues—Acceptance by all entities; cost to replace existing signage; "grandfathering" of existing signs; most agencies are willing to implement, but standards are not in place; some signage is proprietary to entities, so will all accept?

Consistent standards and pedestrian-oriented signage (rather than the diverse designs and messages that we currently have) are needed. The group thought that industry would accept such a recommendation with cost factors in mind and grandfathering for older installations. They would very likely be willing to implement recommendations, but cannot because there are no comprehensive nationwide standards at this time.

Discussion: Pedestrian Safety Issues

The brief Q&A period following the Pedestrian Safety Issues topic area presentations incorporated some key themes. Some discussion revolved around responding to NTSB recommendations and other issues requiring corrective actions. The objective is to mitigate at the lowest level possible; therefore, the balance between the constraints and resources is of key importance. Another theme revolved around the need to disaggregate trespass fatalities from suicides. FRA now has a reporting requirement that addresses this. Precise data identifying hot spots, rather than generalized data, is important for promoting a safety culture. It was also recommended that the chief safety officer of an organization be a direct reporter to the general manager to ensure that mitigation strategies are followed through. A guidelines document, which was developed in response to the Rail Safety Improvement Act of 2008, was cited and offers strategies and methods to reduce station incidents including the use of audible signs, signals, and other infrastructure. The document, dated January 7, 2011, can be found at http://uscode.house.gov/download/pls/49C201.txt

2.3.2 Hazard Management

The Hazard Management panel session was designed to examine hazards along the railroad ROW, and review the hazard management process. The hazard management process defines the physical and functional characteristics of the system and evaluates the key components of that system (i.e., people, rules and procedures, facilities and equipment, and the operating environment). It is from this process that the appropriate mitigation measures are developed and implemented.

Table 10 lists the delegates responsible for identifying the research needs in the Hazard Management topic area during the breakout working group session.

Table 10. Hazard Management Breakout Group

Name	Agency/Organization
Herman Bernal	AZ DOT
Richard Clarke	UT DOT
James Cox	MO DOT
Marco daSilva	Volpe Center
Lois Earle	AECOM
Gary Ferguson	TN DOT
Richard Ferlauto	ROWTF/System Safety Department
James Fox	SEPTA
Daren Gilbert	California PUC
Georgetta Gregory	MARTA
William Grogan	St. Clair County Transit District
William Hughes	Hughes Consulting
Erika Hyatt	Railserve
Emma Inwich	Fulerau Corp/FRA
John Jones	Capitol MTA
Bernard Kennedy IV	Volpe Center
Jon Kerruish	SMART
Gary Lair	MO DOT
Duana Love	U.S. DOT
Levern McElveen	FTA, Moderator
David McKernan	UP
Hamid Qaasim	Sound Transit
Robert Rescot	Purdue University, Calumet
Cory Reynolds	MO DOT
Ella Rogers	Capital Metro
James Sibert	MARTA
George Swimmer	DuPage Railroad Safety Council
Christopher Williams	Amtrak
John Zanzi	Sonoma Marin Area Rail Transit District
Dicky Waldron	Volpe Center, Facilitator

Top Three Recommended Actions for Topic Area 2: Hazard Management

- **Project 1. Safety Culture**
- **Project 2. Data Collection**
- **Project 3. Define Hazard Management**

Effective hazard management poses some serious challenges. Leadership is needed, as well as effective communications, hazard analysis, mitigation, followup, and continuous improvement.

Project 1: Safety Culture

- Description—Elevate safety within organizational culture (incorporate safety into roles/responsibilities). Develop model training program for implementing safety protocols.
- Rationale—Safety is not well ingrained in the organization.
- Benefits—Enhanced employee performance; lower organization cost.
- Key Implementation Issues—None identified.

Hazard Management should be considered a key component of an organization's safety culture. This concept goes beyond the mere creation of a safety climate. "Culture" is the point where hazard management is ingrained into the organization, resulting in the identification and mitigation of hazards before critical issues flare up. To effect a change from "climate" to "culture," the group reported that additional research efforts are needed to identify the individuals involved, determine their roles and responsibilities, and begin developing training modules.

Project 2: Data Collection

- Description—Develop best practices (data quality, aggregate versus disaggregate data, near miss reporting, what technology is effective)
- Rationale—Inconsistency of current data and collection methods
- Benefits—Improve data quality
- Key Implementation Issues—Reach consensus across stakeholders

On the transit side, there is much deliberation occurring in response to Government Accountability Office (GAO) recommendations regarding the linkage between the National Transit Database and the State Safety Oversight program. A transit agency representative noted that the industry currently provides data for inclusion in these data repositories, but there does not appear to be analysis, results, and trends that can aid decisionmaking. In addition, the repositories are inconsistent. To ensure improved decisionmaking across the industry, there is a need to focus on the "what," "how," "who," and outcomes and results. Additionally, there are a lot of disaggregated data that reside in the transit agencies. An example is sick leave. While a transit system is justifiably reluctant to share sensitive data such as this, there is still a need to look into indicators in the work environment itself. The benefits to this are improvement in the quality of data and the story it tells (i.e., better strategies for measuring the improvement of

product quality and more effective metrics that reveal outcomes for what we are doing and how well we are doing it.

Project 3: Define Hazard Management

- Description—Develop common definition, interpretation, and application. Develop a formal committee (FTA's Transit Rail Advisory Committee for Safety (TRACS)/FRA's Railroad Safety Advisory Committee (RSAC)).
- Rationale—No consistent definition/process is used throughout the United States.
- Benefits—There is a need for consistency across agencies on how hazard management strategies are applied. This consistency will eventually lead to better data, safety decisions, and funding justification.
- Key Implementation Issues—None identified.

Hazard management and the other elements of a safety program are not mutually exclusive. It relates to new starts as well as modifications and certifications to older systems, regardless of project size. There needs to be consistency within and between modes such as FRA and FTA, as well as a drawing from FRA's RSAC and TRACS initiatives. This consistency would be more readily obtainable through the use of templates that portray how we are doing and what we are doing.

Hazard Management Discussion

Discussion included the issue of poor urban planning. Older, established railroads are often blamed for creating the hazardous ROW risks when, in fact, risk hot spots emerged after the rail lines were built. With new railroad projects, the urban fabric can be accounted for and mitigated in the design and build phase. For example, new urban development projects adjacent to ROWs often entail environmental studies that allow the railroad to weigh in to mitigate potential hazards. There are standards that exist for these processes—for example, the Texas Transportation Code 85, Title 5–Railroads, Subtitle 1, Special districts—but they lack design criteria. As was the case with the other topic areas, the issue of metrics came up. Although the application of MIL-STD 882-D and other risk assessment models provides matrices and rankings, there is often no quantification of these risks. There is a need for quantification that will help prioritize mitigation strategies and ensure cost effectiveness.

2.3.3 Design, Technology, and Infrastructure

The panel session was designed to examine hazards along the railroad ROW and evaluate the hazard management process. The hazard management process defines the physical and functional characteristics of the system and evaluates the key components (i.e., people, rules and procedures, facilities and equipment, and the operating environment) of that system. It is from this process that the appropriate mitigation measures are developed and implemented.
Table 11 lists the delegates responsible for identifying the research needs in the Hazard Management topic area.

Table 11. Design, Technology, and Infrastructure Breakout Group

Name	Agency/Organization
Kurt Anderson	Campbell Technology Corporation
Peter Bartek	Protran Technology
Herman Benal	AZ DOT
Ray Benekohal	University of IL, Urbana-Champaign
James Benton	MD DOT
Craig Bolden	Clary Corporation
Debra Chappell	FRA, Moderator
Chuck Clemins	Metro St. Louis
Dylan Counts	Washington State DOT
Oscar Figueroa	Metro
Frank Frey	FRA, Moderator
Andrew Ghiassi	Metro St. Louis
Radhameris Gomez	Volpe Center
Martin Gulley	Metro
James Harrison	Volpe Center
Josh Hassol	Volpe Center, Facilitator
Vijay Kohnli	Fulcrum Corporation
Darin Kosmak	TX DOT
Daniel Lafontaine	Transport Canada
Frank Lalonde	Transport Canada
Alfred Longhi	Tymetal Corporation
Peggy Lyda	UP
Brent Ogden	AECOM
Tarek Omar	FRA
Paul Rathgeber	UP
Brian Reeves	FL DOT/Bergmann and Associates
Stephen Reuschle	Moffatt and Nichol
Ronald Ries	FRA
Robert Rohauer	CSX Transportation
Don Sepulveda	LACMTA
David Stewart	CA PUC
Matthew Talken	MO DOT
Kurt Topel	Private Citizen
Mary Toutounchi	Hatch Mott Macdonald
Todd Walters	UP
Kurt Wilkinson	TriMet
Robert Wilson	Metro St. Louis

Top Four Recommended Actions for Topic Area 3: Design, Technology, and Infrastructure

- **Project 1. Fencing Design and Utilization**
- **Project 2. Barriers Designed to Mitigate Pedestrian Distraction**
- **Project 3. Exploratory Technology Research and Education**
- **Project 4. Train-Activated In-Pavement Lights**

Of the 20 recommendations discussed and considered, four made the final cut. The group would have liked to address the other ideas in more detail, but time constraints did not allow for this. The selections were based on the criteria of urgency and ability to implement within a reasonable timeframe—as opposed to something that would require 5 or 10 years. The group agreed that the recommendations were to be practical and common-sense driven, and decided to focus mostly on the "infrastructure" aspect of "Design, Technology, and Infrastructure."

Project 1: Fencing Design

- Description—Establish robust standardized fencing.
- Rationale—Mitigate vandalism.
- Benefits— Keeps fencing intact; prevents trespassing.
- Key Implementation Issues—Learn from LIRR and TriMet; costs can be reduced when purchased in bulk.

The presentations made by TriMet[1] and LIRR[2] weighed heavily in ranking this recommendation. There is a real need to seal our corridors, and we need a more robust style of fencing. The industry should consider a bulk buy. There is a need to conduct some research on costs and benefits to be able to obtain bulk pricing to mitigate intrusions, as stated in Lou Frangella's presentation.[3] As a corollary, we must have a way to keep up with chain-link fence repairs in our efforts to combat vandalism.

Project 2: Barriers Designed to Mitigate Pedestrian Distraction

- Description—Allow railroad preemption to lock the mechanism against entry upon train detection.
- Rationale—Requires physical interaction to open the gate; avoids distraction.
- Benefits—Prevents pedestrians from making contact with trains; maintains headways and service.
- Key Implementation Issues—Connecting to railroad signal systems.

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[1] *Design Features to Mitigate Trespassing*, delivered by Curt Wilkenson.
[2] *Hazardous Assessment Approach to Trespass Management—High Security Fence*, delivered by Richard Ferlauto in Topic Two, Hazard Management.
[3] *Successful Community Outreach*, presented by Lou Frangella in Topic 4, Community Outreach.

There is a need to develop, via railroad circuitry or railroad preemption, a way to electronically control the passenger gate when a train is coming. Such gates should require a physical or human action to manually go through them. The risk of trapping people behind the gate points to the need for emergency push bars. We don't want to over-engineer this. Research is needed to flesh this out.

Project 3: Exploratory Technology Research and Education

- Description—Incorporate existing technologies from other industries to apply to the railroad ROW.
- Rationale—No need to reinvent the wheel.
- Benefits—Proven and cost effective.
- Key Implementation Issues—May be challenging due to railroads' reluctance to experiment with new technologies.

It is recommended that we look outside the railroad industry to see if there are technologies and applications that may be available to "cross-pollinate" with the railroad industry. This approach would use solutions that may already exist. There are hurdles to this option; first and foremost, railroads tend not to like experimentation, especially when there are unknowns such as liabilities and risks that are not fully understood.

Project 4: Train-Activated In-Pavement Lights

- Description—Lights would activate as train approaches, providing additional warning to pedestrians.
- Rationale—Technology is being used at highway-rail grade crossings.
- Benefits—Greater visibility and warning for pedestrians. Reduces train strikes.
- Key Implementation Issues—Who will maintain? Systems will be outside of railroad maintenance zone, but tied into railroad track circuitry.

There is a need to migrate rail grade crossing mitigation techniques to the realm of pedestrians. The pedestrian lights would be activated by railroad circuitry in much the same way as other grade crossing applications. Handrails and other augmentations would also be considered for further investigation.

Design, Technology, and Infrastructure Discussion

Design, technology, and infrastructure planning need to incorporate factors, such as traffic, that exist in the communities surrounding the ROW. Pedestrians need audible signals, signal timing, sight lines, fencing, and other cues. These have to be tied together to ensure incentives, deterrence, and enforcement. We need to dig deep beyond the Three Es to include coalitions and communities. Analytical tools that go deeper into this are out there. Communication is key and must include such things as focus groups, social media, community involvement, and data. Again, the idea is to deploy a hazard management approach in the early phases of development

so that mitigation can be deployed up front. The following two documents were referenced in the conversation:

- TCRP Research Results Digest 84, Audible Signals for Pedestrian Safety in LRT environments, http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rrd_84.pdf
- New Jersey Safety Along Railroads—Short Term Action Plan, http://www.state.nj.us/transportation/commuter/pedsafety/pdf/NJSafetyalongRailroads_000.pdf

2.3.4 Community Outreach

This session presented some community outreach initiatives and programs currently practiced nationwide, presented best practices, and provided a blueprint for creating a successful community coalition.

Table 12 identifies the delegates responsible for identifying the research needs in the Community Outreach topic area.

Table 12. Community Outreach Breakout Group

Name	Agency/Organization
Jennifer Attack	Transport Canada, Rail Safety
Gordon Bowe	UP
Joshua Closson	UP
Kevin Dawson	UP, Moderator
Mark Dixon	Georgetown Railroad
Gary Drouin	GD Solutions
Jessica Feder	Indiana Operation Lifesaver
Lou Frengella	FRA
Mirna Gustave	Volpe Center/MacroSys
William Heileman	BNSF
Nelson High	NC DOT Rail Division
Steve Huckabay	Metro Light Rail
James Hughes	FTA, Region 1
Martha Jimenez	SCRRA/Metroline
Dennis Kearns	BNSF
David Kibitlewski	Wauconda Police
Steve Lazzari	UP
Darlene Osterhaus	KDOT/KS OL
Allen Pepper	KCS
Jeffrey Pitcher	Maine DOT
Ron Robusto	Veolia Transportation
Buck Russel	UP
John Simpson	UP
Roy Simpson	BNSF
Cliff Stayton	CSX
Richard Washington	FRA
David Wright	System Safety
Jack Wright	MO DOT
Carol Yelverton	Volpe Center/MacroSys, Facilitator

Top Four Recommended Actions for Topic Area 5: Community Outreach

- **Project 1. Public Awareness Campaign**
- **Project 2. Community Outreach Partnerships**
- **Project 3. National Community Awareness Day**
- **Project 4. Outreach and Awareness Toolkit**

Our group had very substantive and well-informed conversations. The difficulties of communications were addressed as we evaluated the recommendations. This reminded us of how important these initiatives are. We also reaffirmed that effective communications is the cornerstone of any program, anywhere. The moderator emphasized that stakeholders in both government and industry are the "tip of the sword" for getting the message across. Group enthusiasm was so high that the group could easily have gone beyond the 2 hours allotted.

Project 1: Public Awareness Campaign

- Description—Deliberate, sustained connections within communities. An overarching approach to preventing injury and death that can be customized for specific demographic, cultural, and regional goals. A brand/slogan that is distinctive and memorable. Collaborative, proactive teaming of Federal government, local government, and industry stakeholders.
- Rationale—This will create a unified means to maintain visibility and alter perception of the problem, thus leading to change.
- Benefits—An ongoing, sustainable initiative reflected in strategies that include an ad campaign, media relations, photography, videos, and social media.
- Key Implementation Issues—None identified.

While it is true that the industry has implemented some public awareness campaigns, the group noted that there needs to be a national public awareness campaign designed for and focused on preventing trespassing. Targeted public awareness campaigns might be employed by other industries; if that is the case, applicability to the railroad industry should be considered.

Project 2: Community Outreach Partnerships

- Description—A national initiative that invites stakeholders in communities to develop and implement a trespassing reduction program.
- Rationale—A need to work proactively within communities.
- Benefits—Improved community relations; community goal of preventing trespassing.
- Key Implementation Issues—May be difficult due to nationwide implementation and associated costs.

There are partnerships established in various pockets around North America. A need exists for organized processes that make this happen more systematically and comprehensively across the industry.

Project 3: National Community Awareness Day

- Description—Implement a railroad trespasser prevention awareness day.
- Rationale—Industry, communities, and Federal government to get together to address the problem; day of dedication.
- Benefits—Nationwide exposure.
- Key Implementation Issues—Very achievable.

This has to be very deliberate, sustained, and tied together in an overarching way. There is no one-size-fits-all. The messages need to be customized to various demographics and cultural and regional contexts. There needs to be involvement by all levels of government and stakeholders. A major challenge has to do with perception. We need to address the perception that ROW safety is "their"(the railroad's) problem; rather, it is "our" problem. We need to use media relations, YouTube, and other social media to get the public involved. National and State level involvement is needed to obtain optimal visibility—all stakeholders will be encouraged to participate in the nationwide day of dedication. This participation will lead to reenergized communications and networking activity centered on awareness initiatives.

Project 4: Outreach and Awareness Toolkit

- Description—Communications resources that provide local relevance, address ongoing issues, and provide a means to solve problems.
- Rationale—Need an effective way to communicate locally to prevent railroad trespassing.
- Benefits—Effective way to communicate locally to prevent railroad trespassing.
- Key Implementation Issues—Moderately difficult due to stakeholder buy-in.

We have tools; now, let's share them. Communication is important. We need a toolkit for use in developing sustainable and comprehensive programs that optimally meet local community needs while also addressing broader nationwide efforts. To facilitate local awareness, buy-in is needed from the community. We need to make it interesting for them to do so.

Community Outreach Discussion

There was a robust discussion after these presentations. It was agreed that community outreach—using social media and other forms of communication—would play a key role. Key strategies included focusing plans with data and field intelligence; letting communities know that people are getting hurt; and finding, fixing, and following up. Group members concluded that there is a need to make messaging easier; one such way is by incorporating safety material into student curricula without putting any additional burden on teachers.

A powerful moment was when a private citizen explained how his daughter was killed on the tracks. The kids don't see the danger on the track. There is a need, as with drunk-driving campaigns, to make trespasser dangers personal; the kids still drink, but because of increased

knowledge about the ramifications of such behavior, they have more fear of driving across the tracks.

A suggestion was made for measures other than "incidents" to include near misses, which could increase the predictive value of the data. Currently, for example, train engineers at UP report safety and trespass observations up the line of command.

Railroad safety-themed visits to schools, even where there have been no incidents, can help prevent incidents from ever occurring.

One interesting discussion concerned an urban myth that there were ghosts near the ROW. The ghost story was passed down from one class year to the next. This has served to deter trespassing and should be encouraged.

2.3.5 Enforcement

This session presented a number of safety and security initiatives that are currently in place and are being effectively implemented to identify, apprehend, prosecute, and track trespassers along railroad ROWs. This session sought to provide participants with information that can be "taken home" and put into practice, potentially resulting in a reduction of trespasser incidents nationwide.

Table 13 identifies the delegates responsible for identifying the research needs in the Enforcement topic area.

Table 13. Enforcement Breakout Group

Name	Agency/Organization
Chris Adams	FRA
Shanna Bahr	St. Louis County Police Dept.
Joseph Cantu	UP Police
Ronald Danback	St. Louis County Police Dept.
Jason Davis	Metro St. Louis
Rick Deichmann	NS
Thomas Dynes	UP Police
Denise Gauthier	BNSF
Michail Grizkewitsch	FRA
Ryan Gustin	CSX, Moderator
Jay Holman	UP
Gary Jones	Amtrak Police Department
Jerald Lamkin	Terminal Railroad Assoc., St. Louis
Randy Lane	UPRR Police
Andy Lehrer	Volpe Center, Facilitator
Gary Lottmann	Alton and Southern Railway
Ivan McClelland	CP Police Service
Michael Meyer	UP
Rick Mooney	MO OL

Name	Agency/Organization
Thomas Morrison	UP Police
George Muraski	Terminal Railroad
James Parker	UP Police
Al Rawls	Kansas City Southern Railway
John Schumacher	UP
Shel Senek	Ohio State Highway Patrol
George Slaats	UP Police
Emile Smith	DDOT
Rick Thornton	UP Police
Richard Towle	FRA
Todd Walters	UP
Michael Wilson	UP
Richard Zotl	Metro St. Louis

Top Five Recommended Actions for Topic Area 5: Enforcement

- **Project 1. Seek Full Police Authority across All 50 States for Railroad Police Officers**
- **Project 2. Develop Specific Railroad/Transit Trespass Law That Can Be Applied Broadly and with Consistent Language across the United States**
- **Project 3. (A) Focus on "High Value" Targets, i.e., Trespassers with Malicious Intent, Homeless, Drug/Alcohol, Other; (B) Strategies for Different Types of Trespassers—Casual, Impaired, Malicious**
- **Project 4. Strive to Have "Crucial Conversations" with Local Courts/Prosecutors to Prioritize Trespass**
- **Project 5. Seek Opportunities to Apply for and Develop Law Enforcement Grants That Can Target Trespass**

This breakout group's deliberations were a great success. Twenty-two topic areas were identified and the top five were selected through the voting process.

Project 1: Railroad Police Authority

- Description—Seek full police authority, across all 50 States, for railroad police officers.
- Rationale—Railroad police have diminished effectiveness in carrying out their mission when their authority to arrest, apprehend, and prosecute changes from State to State.
- Benefits—Ability to more effectively contact trespassers, build stronger relationships with other agencies, and create sovereignty.
- Key Implementation Issues—NSA, IACP, and police unions are often hesitant to support "new" agencies—private/public difficult to understand.

This recommendation suggests that full police authority across all 50 States be conferred for railroad police officers. As it is, railroad police cannot be effective in dealing with ROW trespass incidents without the partnership of local police departments. There are many

intricacies to how railroad officers derive their police powers. A national model would enhance the enforcement efforts of all parties because the authority of railroad police would be consistent across all States. This would lead to more effective enforcement by facilitating arrest, apprehension, and prosecution across jurisdictional lines. Buy-in is needed by sheriffs' associations and unions to work out how the private/public interface would be handled.

Project 2: Broad-Based Trespass Law

- Description—Railroad-specific trespass law that can be applied broadly across the United States (consistent language).
- Rationale—Railroad/transit ROW trespass is currently viewed as "low priority" because it falls under the same status as all other forms of trespass; enforcement requirements change from State to State.
- Benefits—A single law, written specifically for our issues, will help to build uniformity and make it easier to educate the public.
- Key Implementation Issues—Model legislation is easy to develop (i.e., FRA), but "encouraging" the States to implement it is another issue. Perhaps a good option is to tie trespass laws to grant funding?

Currently, laws regarding trespassing vary from State to State. This recommendation is for one national, uniform law that would allow for consistency and a better-educated public. FRA has developed model language; the States should be encouraged to adopt a similar approach. To help accomplish the adoption by States, FRA could perhaps condition funding on the adoption of a standard set of laws.

Project 3: Strategic Approach to Different Types of Trespassers

- Description—Focus on "high value" targets, i.e., approach to trespassers with malicious intent, homeless, and drug/alcohol (impaired) should be different from approach to the casual trespasser.
- Rationale—You have to develop specific approaches to affect the behavior of different types of trespassers.
- Benefits—Be able to reach out to the target audience more effectively, especially where the data has been shown to be ineffective.
- Key Implementation Issues—Will require creative thinking and multiple "trial and error" phases. Will also require a cross-functional effort by all involved parties.

Strategies are needed for different types of trespassers: 1) casual, 2) malicious, and 3) impaired. Criminal, homeless, drug and alcohol populations need to be identified; the approach to these populations differs from the approach to the student crossing the tracks or the rail fan taking a picture, which is a lower-level threat. Effectively reaching out to these groups will rely on data that shows where such efforts will have the greatest impact. This is a strategic approach. Targeting high-risk groups will require creative thinking and a trial-and-error approach.

Project 4: Crucial Conversations

- Description—A need exists to have "crucial conversations" with local courts/prosecutors to encourage making trespass on railroad ROW a priority.
- Rationale—With respect to trespass, we have the data to defend this position. The dangers associated with this type of criminal behavior warrant the courts taking it seriously.
- Benefits—When a suspect makes a conscious decision to trespass, the benefits will no longer outweigh the consequences—there is more bite than bark!
- Key Implementation Issues—You have to have the buy-in and personal relationships with your judicial stakeholders. If this is the first time they have heard from you, you will most likely have a harder sell. Squeaky wheel gets the grease?

Communicate with and encourage courts and prosecutors to make railroad ROW trespassing a priority. We have the data to defend our position that this is a huge concern due to the grave danger. With railroad trespass crimes becoming a higher priority, the consequences of trespassing outweigh any benefits. We need to reach out to prosecutors and court systems at the local level. With established contacts, the selling of this concept would not be difficult; however, more outreach would be required for new contacts.

Project 5: Seek Law Enforcement Grants

- Description—Seek opportunities to apply for and develop law enforcement grants that can target trespass.
- Rationale—Everyone needs money and resources. Many law enforcement agencies want to help, but they just don't have the manpower, technology, etc., to allocate to trespass enforcement.
- Benefits—You are simply sponsoring the "community" approach. Reduction of trespass incidents and fatalities being the #1 goal.
- Key Implementation Issues—Where does this money come from? What is the allocation mechanism? Can we mirror the Section 130 program?

Many law enforcement organizations would like to help, but have limited resources. An effort to obtain grants would be of great help. We should explore the applicability of Federal Motor Carrier Safety Administration (FMCSA) Section 130 grade crossing funding. We hope that this effort would further foster community partnerships.

Enforcement Discussion

Everyone agreed that there are a lot of extant tools to help law enforcement initiatives. There is no need to reinvent the wheel. The Trespass Enforcement and Incident Resolution programs have trained engineers to report observations. Operation Lifesaver videos are very effective. A LIRR task force now reports ROW debris because multiple debris incidents can indicate a potential hot spot. Also, an officer dedicated to ROW issues has allowed LIRR to create great partnerships with the communities by educating local police jurisdictions about what to look for. This helps when an interdiction is needed. Special Weapons and Tactics teams, for instance, would be more familiar with how law enforcement provides rapid response to a rail incident. A

database for officers that are struck on ROWs called Officer Down Memorial Web Site, www.ODMP.org, really gets the attention of law enforcement officers and is helpful to raise awareness.

2.3.6 Intentional Deaths/Acts

This session looked at current practices and research studies intended to mitigate or eliminate intentional death acts on the Nation's railroad ROWs. This session provided attendees the opportunity to discuss current industry and public practices aimed at the prevention of intentional deaths. Session objectives included shared risk identification, statistical analysis, mapping high-risk areas, and developing future prevention strategies and methods to gauge their success.

Table 14 lists the delegates responsible for identifying the research needs in the Enforcement topic area.

Table 14. Intentional Deaths/Acts Breakout Group

Name	Agency/Organization
Leonard Allen	Volpe Center
Ingrid Bartinique	Volpe Center/MacroSys, Facilitator
Bob Boston	UTC
Louis Brown	WMATA
Willis Brown	UP
Linda Langford	Suicide Prevention Resource Center, EDS, Inc.
Jason Davis	Metro
Scott Gabree	Volpe Center
Charles Hagood	FRA, Moderator
Diane Hagood	Yosemite School District
Matthew Harvard	UP
Dario Hayes	St. Louis County Police
Cliff Kierstead	Kirkwood Police Department
Joseph Kreins	SMART
Julie LaCombe	KS Operation Lifesaver
Linda Langford	Suicide Prevention Resource Center
Rober Ledoux	Florida East Coast Railway
Michael Martino	AAR
George McManus	UP
Corey Reynolds	MO DOT
Jeff Schmid	BNSF
Norbert Shacklette	UP
Stacy Smith	St. Louis Metro Police Department (PD)
Bradley Thorne	UP
John Winkler	St. Louis Metro PD
Richard Zott	St. Louis Metro PD
Gary Hod	NS

Top Three Recommended Actions for Topic Area 6: Intentional Deaths/Acts

- **Project 1. Education**
- **Project 2. Eliminating Trigger Terminology from Public Communication**
- **Project 3. Exploration of Trespass Prevention Messaging**

This is a very touchy subject; it is very broad and requires working together. Communicating with each other is the key. The recommendations below align with the work done by the other working groups.

Project 1: Education

- Description—How can message change behavior? How do we create deterrents to change a mindset?
- Rationale—Lack of message consistency.
- Benefits—Increased effectiveness of messages.
- Key Implementation Issues—None identified.

There is no single way to look at this; there are many ways. In all cases, the question is, how can we manage to change potential trespassers' behavior and mindset? We have a long way to go with research on this. This issue is commingled with other trespasser mitigation approaches in general, so the messaging contained in an educational program needs to be consistent as well as targeted. The objective is to mitigate trespassing through deterrence. The messaging must not be sensationalistic, such as using the words "intentional death act" rather than "suicide." We need a toolkit so that all stakeholders involved can have access to the optimal tools for their situation.

Project 2: Eliminating Trigger Terminology from Public Communication

- Description—What terminology can or should be used in media, presentations, Web sites, and technical reports? Develop guidelines for terms to share information without providing unintended triggers.
- Rationale—Eliminate trigger terminology from communications.
- Benefits—Consistency in communication will prevent unintended triggers and deter individuals from using rail for intentional death acts.
- Key Implementation Issues—None.

We need guidance for using terms that do not draw undue attention to intentional death acts on the railroad. The Golden Gate Bridge, for instance, continues to be used for intentional death acts, but the press does not report on them so as not to draw undue attention to these occurrences. The railroads could give generic information that something happened, but without details as to exact location. The messaging should be left for the experts to formulate—appropriate messaging will convey the circumstances without getting too specific regarding location and the like. In essence, we are talking about perception. As with other

recommendations throughout this workshop, data is a key component that tells us where we are and where we are going.

Project 3: Exploration of Trespass Prevention Messaging

- Description—Develop campaign and marketing emphasizing that not all strikes results in fatalities. Also, stop campaigns that say trespassing will kill you.
- Rationale—People won't attempt suicide by rail for fear of not succeeding.
- Benefits—Should work to reduce both trespass and suicide.
- Key Implementation Issues—None identified.

This applies to the message that if a person steps in front of the train, he/she might live through the hit. The objective is deterrence; if folks understand that they might survive, they might reconsider, especially in light of the quality of life that would be experienced afterwards. From what we heard in presentations before the breakout sessions, NJ Transit and Caltrain created materials that seem to have worked. We should look at these and other initiatives. Developing and disseminating this information will be hard work due to the diversity of issues and circumstances.

Intentional Deaths/Acts Discussion

There was discussion regarding data and how to determine whether a trespasser death is accidental as opposed to intentional. In the transit world, 49 CFR 225–Railroad Accidents/Incidents: Reports Classification, and Investigations now requires this, but there remains a lack of guidance as to what investigatory measures must be taken once the cause is known. More research is needed on determining whether the death is intentional or not; the Volpe Center, for instance, is working with coroners to help develop data points to help identify the cause of death. Overseas, the United Kingdom simply categorizes all ROW deaths as suicide so no payouts are made by insurance companies. In Japan, families of trespass deaths are fined a large sum of money. The idea is to influence cultural awareness of the dangers of trespassing as well as to stigmatize these actions. Another measure is the avoidance of trigger terminology that might encourage others to consider suicide on the ROW. This involves the proper wording of materials for media reporting.

3. Top Research Needs, Thursday Wrap-Up Discussion

After the topic area recommendations were presented, the microphones were opened to the group for general discussion and closing thoughts.

It was noted that there was a good deal of synergy between the groups, which underscores the need for a robust safety culture. The Hazard Management topic team corroborated this need as did the Community Awareness team when they spoke of a comprehensive public awareness campaign to help promote a safety culture.

Our efforts should extend beyond the boundaries of the ROW to encompass all pedestrian trespass behaviors communitywide (e.g., jaywalkers or those that cross against a traffic light). This broader perspective sends the message that these behaviors are not confined to trespassers on the ROW but apply to the community as a whole; this in turn entails wider coordination and outreach in our efforts to mitigate trespass behaviors.

The question, "Who is going to pay for these?" came up. The recommendations, many of which are cross-cutting (versus stovepiped), could be creatively addressed through pilot studies involving shared track or ROW. The parties could create, collaborate on, and consolidate ideas and perhaps even reach an agreement concerning the use of shared funding to address these cross-cutting and shared issues.

A robust safety culture starts at the top—government bodies and the board levels of an organization. Those attending this workshop are the troops who "get their feet dirty." We need to take our knowledge, expertise, and experience back to our organizational leaders. Our objectives can be accomplished through outreach and enforcement, the promulgation of many of the ideas exchanged here, and cross-pollination across the full spectrum of stakeholders and professional areas of specialty.

An example of this approach is exhibited on the Web site, www.envisionfreight.com, which focuses on multimodal approaches to urban planners and architects. This site was developed in response to a survey of college curricula which indicated that there were no programs for planners and architects to learn about freight railway operations. A course is being developed to fill this gap at the University of Texas School of Architecture and the LBJ School of Public Affairs. At St. Louis University, a curriculum model is being developed to include freight operations as a part of urban planning courses. Accordingly, freight railroad safety considerations will be factored into community and urban planning courses. A critical point is that infrastructure concerns be addressed as multimodal issues, as in the case of shared corridors and the like. Also, transit-oriented development considerations should be taken into account. At University of California–Berkeley, there are a number of courses under development that address railroad issues.

As mentioned in the Intentional Deaths/Acts working group, data is needed to differentiate between intentional acts and unintentional injuries or deaths. We need to parse the message to reach each kind of trespasser, but the goal is to do so without glamorizing railroad intentional

deaths in a way that draws people to the idea. All of this underscores many of the findings of the other groups; that is, data and collaboration are going to be needed across the board.

There are a number of universities interested in transportation or civil engineering, or who already have transportation or civil engineering programs in place. A workshop participant, a professor, mentioned that there are a number of universities that have transportation centers and civil engineering departments interested in railroads and transit.

4. Final Thoughts and Workshop Closeout

Levern McElveen of FTA and Ron Ries of FRA delivered the closing remarks.

FTA: On behalf of FTA and my director, Ron Keele, I wish to say how very impressed I am with the enthusiasm of the group, your valuable involvement, concerns, and ideas exchanged. I am going to recommend to FRA that we continue the work of this group via teleconference or webinar formats so that we can continue to improve data, communications, and the other factors discussed. From FTA's perspective, we are engaged in MAP-21, a massive undertaking with which FTA must comply within 3 years. We need all the help possible. I am going to let my higher-ups know that this is how we do it; we gather industry in the form of focus groups to tell us how to build the MAP-21 provision out.

FRA: FRA seconds what was just said. It says a lot about your dedication that on the last day of a workshop such as this, most of you are still here. FRA wishes to challenge attendees regarding the long road ahead; lots of effort will be needed to keep folks safe, save lives, and avert pain to families and the many affected. The challenge is to go beyond taking notes to putting some of the ideas into practice. FRA suggests that we continue the relationships that were established at this workshop. It is not that often that folks from FTA and FRA get to work together. We have learned a great deal about the commonality of issues and problems that are faced by general rail and transit operations. We need to keep in contact and keep going. FRA likes FTA's suggestion of conference calls and the like. In addition, we will be looking for ways to improve and better coordinate efforts. We will post presentations and ancillary materials to the FRA Web site. To help make these more beneficial and effective, we ask that you respond to a survey that will be sent out. FRA plans to set up a Facebook page covering this conference which will provide another way for us to communicate.

Appendix A. Workshop Materials

A word about the dissemination of workshop materials via Internet:

This year, FRA has done away with what would have been a Volume 2, as in 2008. That volume contained handouts, presentations, biographical sketches, ancillary documents, attendees and the like.

In its stead, FRA has established the following Web site: http://www.fra.dot.gov/conference/trespass2012/index.shtml for summary materials, presentations, history, and contact information. A snapshot is shown in Figure 4.

FRA intends to keep this site up to date as other resources become available.

This workshop does not need to stop on August 16, 2012. It can continue through the use of the Internet. In the near future, the agency is considering a shared site like SharePoint™ and social media—Facebook, Twitter, or a blog—where further discussion and sharing of information can continue.

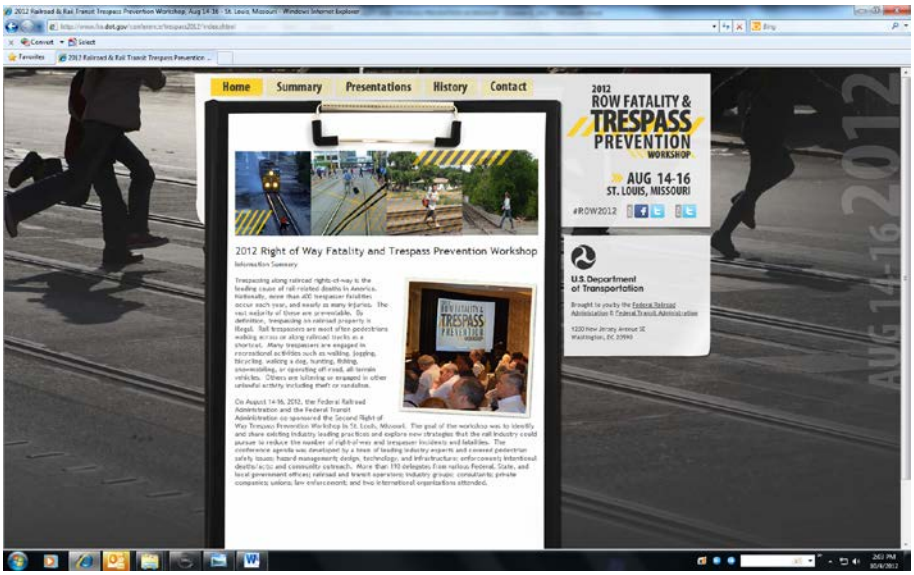

Figure 4. 2012 ROW Fatality and Trespass Prevention Workshop Home Page

Appendix B. Post-Workshop Electronic Survey Results

1. Which of the following best describes the industry you belong to?

	Response Percent	Response Count
Federal	20.3%	12
State	13.6%	8
Local	5.1%	3
Transit Agency	18.6%	11
Railroad	**27.1%**	**16**
Consultant	6.8%	4
Union Representative	0.0%	0
Association or organizations representing the railroad community	1.7%	1
Academic or University Research	0.0%	0
Education and Public Awareness	1.7%	1
Other	5.1%	3
	If Other please specify	3

answered question	**59**
skipped question	**0**

2. Please rate your satisfaction level for the registration process.

	Response Percent	Response Count
Extremely Satisfied	**61.0%**	**36**
Very Satisfied	33.9%	20
Somewhat Satisfied	5.1%	3
Dissatisfied	0.0%	0
	Comments	7
	answered question	**59**
	skipped question	**0**

3. Please rate your satisfaction level for the workshop presentations.

	Response Percent	Response Count
Extremely Satisfied	**47.5%**	**28**
Very Satisfied	**47.5%**	**28**
Somewhat Satisfied	5.1%	3
Dissatisfied	0.0%	0
	Comments	15
	answered question	**59**
	skipped question	**0**

4. Please rate your satisfaction level for the workshop session structure.

		Response Percent	Response Count
Extremely Satisfied		39.0%	23
Very Satisfied		**54.2%**	**32**
Somewhat Satisfied		5.1%	3
Dissatisfied		1.7%	1
		Comments	16

answered question	**59**
skipped question	**0**

5. Please rate your satisfaction level for the breakout session/discussion results.

		Response Percent	Response Count
Extremely Satisfied		22.0%	13
Very Satisfied		35.6%	21
Somewhat Satisfied		**37.3%**	**22**
Dissatisfied		5.1%	3
		Comments	21

answered question	**59**
skipped question	**0**

6. Please rate your satisfaction level for the courtesy and helpfulness of the workshop staff.

		Response Percent	Response Count
Extremely Satisfied		**69.5%**	**41**
Very Satisfied		30.5%	18
Somewhat Satisfied		0.0%	0
Dissatisfied		0.0%	0
		Comments	9

answered question	**59**
skipped question	**0**

7. Please rate your satisfaction level for the conference location and facilities.

		Response Percent	Response Count
Extremely Satisfied		**49.2%**	**29**
Very Satisfied		40.7%	24
Somewhat Satisfied		10.2%	6
Dissatisfied		0.0%	0
		Comments	13

answered question	**59**
skipped question	**0**

8. Please rate your satisfaction level for the overall quality of the workshop.

		Response Percent	Response Count
Extremely Satisfied		**50.8%**	**30**
Very Satisfied		44.1%	26
Somewhat Satisfied		5.1%	3
Dissatisfied		0.0%	0
		Comments	7

answered question	**59**
skipped question	**0**

9. How did you first hear about the workshop?

		Response Percent	Response Count
Email		**47.5%**	**28**
Website		3.4%	2
From a Colleague		44.1%	26
Other		5.1%	3
		If Other please specify	4

answered question	**59**
skipped question	**0**

10. Did the Workshop meet your expectations?

		Response Percent	Response Count
Yes		**94.9%**	**56**
No		5.1%	3
		Comments	16

answered question	**59**
skipped question	**0**

11. What did you like most about the Workshop?

Response Count
46

answered question	**46**
skipped question	**13**

12. What did you like least about the Workshop?

Response Count
39

answered question	**39**
skipped question	**20**

13. What kind of topics would you like to see included at future Workshops?

	Response Count
	35
answered question	**35**
skipped question	**24**

14. How often should this type of workshop be held?

		Response Percent	Response Count
Every Year		30.5%	18
Every 2 Years		**52.5%**	**31**
Every 3 Years		11.9%	7
Every 5 Years		0.0%	0
No Preference		5.1%	3
	answered question		**59**
	skipped question		**0**

15. Please provide any additional comments.

	Response Count
	13
answered question	**13**

Appendix C. Workshop Agenda

Tuesday, August 14

7:30 – 8:30 am	Registration
8:30 – 10:00 am	Opening Session *Welcome Addresses:* • John M. Nations, CEO, Metro St. Louis • Mokhtee Ahmad, FTA Region VII Administrator *Keynote Address:* • Joseph C. Szabo, FRA Administrator *General Addresses:* • Ronald Ries, FRA • Levern McElveen, FTA *Trespassing Issues that Face the Nation*
10:00 – 10:15 am	Break
10:15 – 11:45 am	Session 1: *Pedestrian Safety Issues* *Moderator:* William P. Grizard, APTA • Ron Nickle, MBTA — *A System Safety Approach to G.C. Mgt. Planning for Pedestrians* • Sheree Davis, NJDOT *New Jersey SafetyAlong Railroads Actions* • Carolyn Cook, FRA *Pedestrian Safety at Passenger Stations*
12:00 – 1:00 pm	Lunch (On Your Own)
1:00 – 2:30 pm	Session 2: *Hazard Management Moderator:* Levern McElveen, FTA *Moderator:* Frank Frey, FRA • Daren Gilbert, CPUC *Regulator Approach: 49 CFR 659* • Marco daSilva, Volpe — *FRA Funded Research: Florida DOT and Tri-Rail Study* • James Fox, SEPTA *Hazard Management Experiences: SEPTA* • Richard A. Ferlauto, LIRR — *LIRR Experiences: High Fences Risk Analysis and Methodology*
2:30 – 3:00 pm	Break
3:00 – 4:30 pm	Session 3: *Design, Technology, and Infrastructure* *Moderator:* Debra Chappell, FRA *Moderator:* Frank Frey, FRA • Brent Ogden, AECOM *Engineering Trespassers Out of Rail Corridors* • Don Sepulveda, L.A. City Metropolitan Transportation Authority — *Designing for Safety* • Kurt Wilkinson, TriMet *Design Features to Mitigate Trespassing* • Peggy Lyda, Union Pacific Railroad *Fresno Trespass Campaign*

4:30 – 4:45 pm Adjournment
- Ronald Ries, FRA
- Levern McElveen, FTA

Wednesday, August 15

7:30 – 8:15 am Registration

8:15 – 8:30 am Welcome
- Ronald Ries, FRA
- Levern McElveen, FTA

8:30 – 10:00 am Session 4: *Community Outreach*
Moderator: Kevin Dawson, UPRR
- Jay Holman & John Simpson, UPRR
  Community Coalition Focus Plans
- Lou Frangella, FRA
  Successful Community Outreach Programs
- Bill Barringer, NS RR
  Train Your Brain—NA Safety Campaign
- Richard Washington, FRA
  National Trespass Programs

10:00 – 10:15 am Break

10:15 am – 12:00 pm Session 5: *Enforcement*
Moderator: Ryan Gustin, CSX
- Shel Senek, Ohio State Patrol (Retired)
  Trespass Enforcement and Incident Program
- Gary Jones, Amtrak Police
  Passenger Rail Trespassing Concerns: Insights from Amtrak Police
- Bryan Madden, BNSF & Rick Deichmann, NS Police
  Citizens for Rail Security/Protect the Line

12:00 – 1:00 pm Lunch (On Your Own)

1:00 – 2:30 pm Session 6: *Intentional Deaths/Acts*
Moderator: Charlie Hagood, FRA
- Dr. Linda Langford, Suicide Prevention Resource Center
- Scott Gabree, Volpe — *Nationwide Database to Track Trespass & Suicides*
- Mike Martino, AAR — *Countermeasures to Reduce Suicides on Railroad Rights of Way*
- Louis Brown, WMATA —*Suicide Prevention Program*

2:30 – 2:45 pm *Organization of Working Groups/ Introduction of Teams*

2:45 – 3:00 pm Break

3:00 – 5:00 pm Working Group Breakouts
- *Pedestrian Safety Issues* (Green Team) Location: Salon A
- *Hazard Management* (Red Team) Location: Salon B
- *Design, Technology and Infrastructure* (Yellow Team) Location: Salon D
- *Community Outreach* (Orange Team) Location: Salon E
- *Enforcement* (Blue Team) Location: Salon F
- *Intentional Deaths/Acts* (Purple Team) Location: Salon C

5:00 pm Adjournment/Team Leads Report Out

Thursday, August 16

8:00 — 8:15 am	*Welcome Addresses:* • Ronald Ries, FRA • Levern McElveen, FTA
8:15 — 10:15 am	Working Group Summaries of Top Research Needs
10:15 — 11:00 am	Final Thoughts and Workshop Closeout

Abbreviations and Acronyms

AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation Officials
APTA	American Public Transportation Association
AREMA	American Railway Engineering and Maintenance-of-Way Association
DARE	Drug Abuse Resistance Education Program
EPA	Education and Public Awareness
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GPS	Global Positioning System
HSR	High-Speed Rail
LACMTA	Los Angeles County Metropolitan Transportation Authority
MAP-21	Moving Ahead for Progress in the 21st Century
MBTA	Massachusetts Bay Transportation Authority
MUTCD	Manual on Uniform Traffic Control Devices
NHTSA	National Highway Traffic Safety Administration
NRC	National Response Center
NTSB	National Transportation Safety Board
OLI	Operation Lifesaver, Inc.
PTC	Positive Train Control
R&D	Research and Development
RITA	Research and Innovative Technology Administration
RSAC	FRA Railroad Safety Advisory Committee
RSIA	Rail Safety Improvement Act of 2008
Section 130	23 U.S.C. 130, Rail-Highway Crossings
SSPP	System Safety Program Plan
Three Es	Education, Engineering, and Enforcement
TRACS	FTA Transit Rail Advisory Committee for Safety
U.S. DOT	U.S. Department of Transportation
Volpe Center	John A. Volpe National Transportation Systems Center
WMATA	Washington (DC) Metropolitan Area Transportation Authority