Presented by:

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U.S. Government Grade Crossing Research & Stakeholder Engagement

International Level Crossing Awareness Day (ILCAD) — 11TH EDITION
Amersfoort, Netherlands • June 6, 2019 • 16:00 - 16:55
Theme of Session: Engineering, Innovation

U.S. Department of Transportation
Federal Railroad Administration

Federal Railroad Administration (FRA)

FRA's Mission:

- *To enable the safe, reliable, and efficient movement of people and goods for a strong America, now and in the future.*

We accomplish our mission of grade crossing safety and trespasser prevention by:

- Issuing and enforcing safety regulations
- Investing in rail corridors
- Conducting research and developing technology

Image source: https://www.aar.org/railroad-101

U.S. Grade Crossing and Trespassing Trends

The U.S. Railroad System

775
Railroads

140,000
Route Miles of Track

209,000
At-Grade Railroad Crossings

Crossings in the U.S.

Active
54%
(with gates, bells, and/or flashing lights)

Passive
46%
(with signs and markings, but not active warning devices)

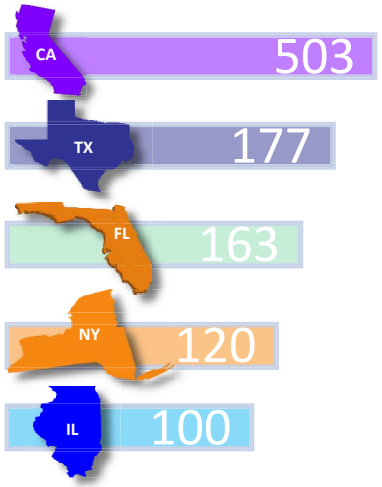
Stop! Trains Can't!

A train traveling
55 mph
takes
1 mile
or more to stop!

5-Year Trespassing Trends

Fatalities
470 (2014)
570 (2018)
21%

Top 5 for Trespassing Fatalities
(2014—2018)

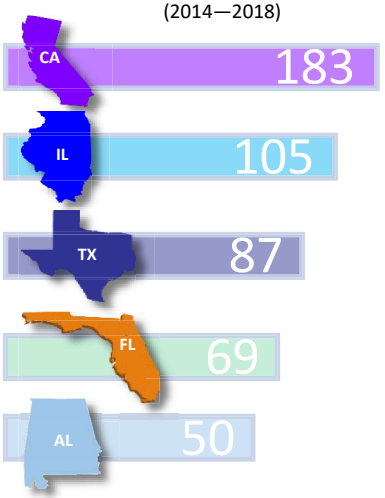


9 people or vehicles are hit by a train daily.

5-Year Crossing Trends

Fatalities
262 (2014)
270 (2018)
3%

Top 5 for Crossing Fatalities
(2014—2018)



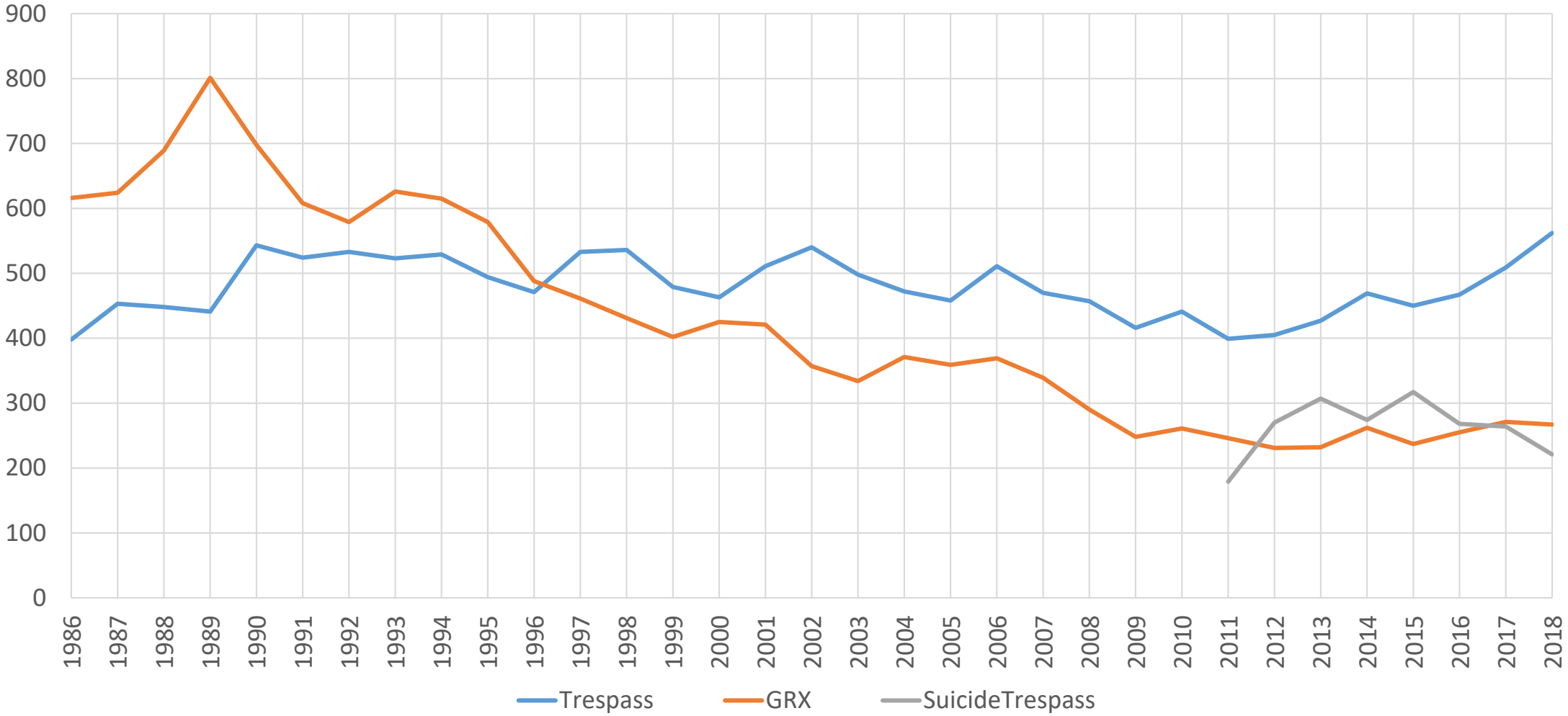
Drivers
14% of all Incidents (2014-2018)

1,538 drivers went around lowered gates.

Bottom Line
95% of rail-related fatalities over past 10 years

are due to railroad crossing and trespassing.

Fatalities in the United States



Source: FRA Safety Data, May 28, 2019

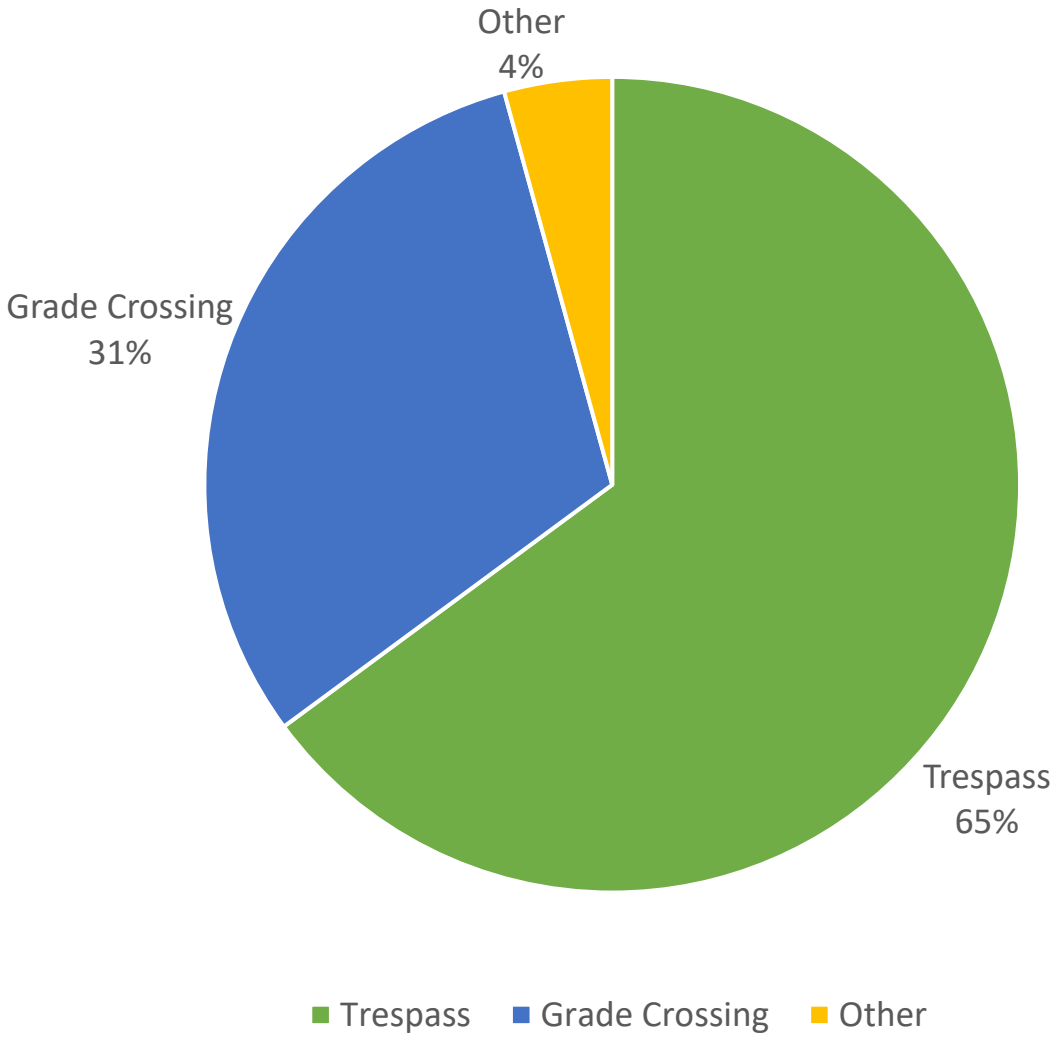
2018 Fatalities in the United States
[excluding suicides]

Highway-Rail Grade Crossing

- 267 fatal, down 1% from 2017

Rail Trespassing

- 562 fatal, up 10% from 2017



Source: FRA Safety Data, May 28, 2019

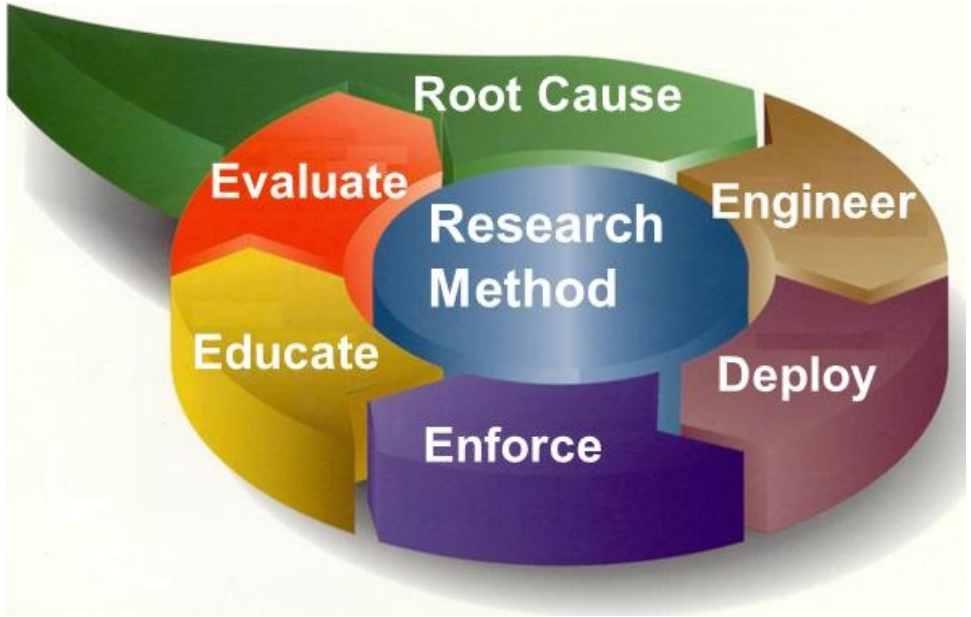
Highway-Rail Grade Crossing Safety and Trespass Prevention Research Program

Goal

- Analyze impact causation and develop safety countermeasures, programs, and guidance to reduce the number of causalities at grade crossings and along railroad rights-of-way

Research Methods

- Research the root cause of incidents and fatalities
- Identify corrective actions
  - Engineering, Enforcement, Education
- Engage stakeholders
- Deploy and evaluate solutions



1. Photo-Based Education at Crossings

Project Description

- Studied the effectiveness of photo enforcement to detect and enforce highway-rail grade crossing violations
- Location: Orlando, Florida

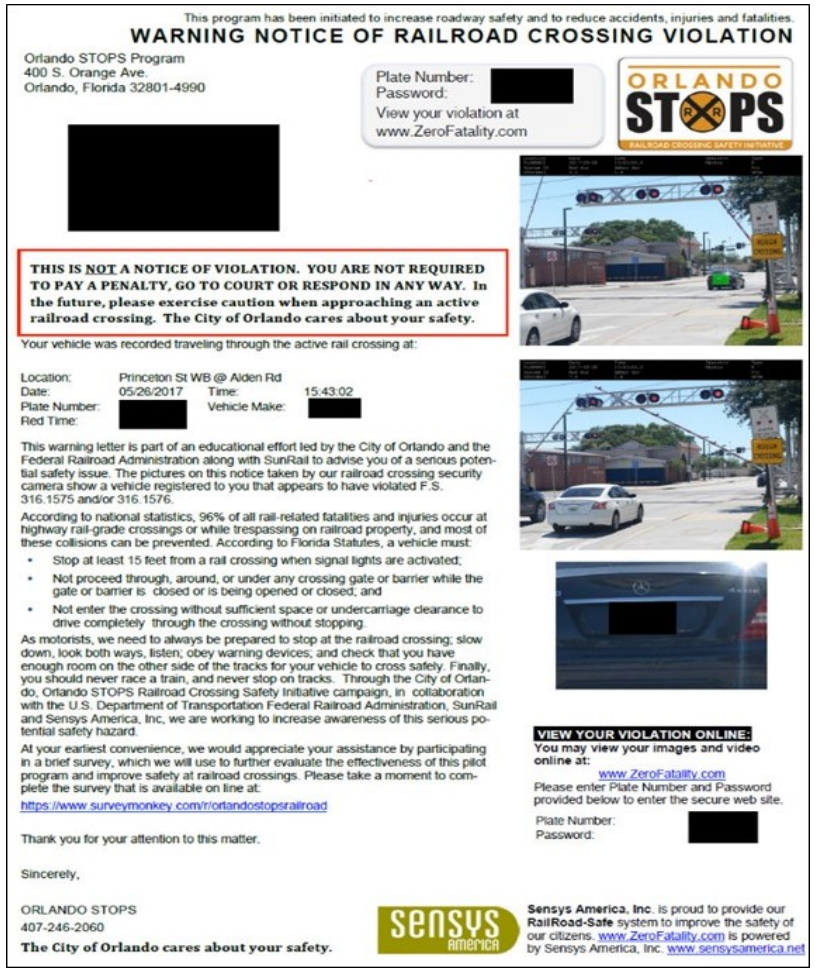
Status

- 2,958 violation notices

  (August 11, 2016 – December 31, 2018)
- 333 survey responses

  (August 11, 2016 – December 31, 2018)

Photo-Based Education at Crossings: Violation Notice and Educational Material



This program has been initiated to increase roadway safety and to reduce accidents, injuries and fatalities.

WARNING NOTICE OF RAILROAD CROSSING VIOLATION

Orlando STOPS Program
400 S. Orange Ave.
Orlando, Florida 32801-4990

Plate Number: [redacted]
Password:
View your violation at
www.ZeroFatality.com

ORLANDO STOPS

[redacted]

THIS IS NOT A NOTICE OF VIOLATION. YOU ARE NOT REQUIRED TO PAY A PENALTY, GO TO COURT OR RESPOND IN ANY WAY. In the future, please exercise caution when approaching an active railroad crossing. The City of Orlando cares about your safety.

Your vehicle was recorded traveling through the active rail crossing at:

Location: Princeton St WB @ Alden Rd
Date: 05/26/2017 Time: 15:43:02
Plate Number: [redacted] Vehicle Make: [redacted]
Red Time:

This warning letter is part of an educational effort led by the City of Orlando and the Federal Railroad Administration along with SunRail to advise you of a serious potential safety issue. The pictures on this notice taken by our railroad crossing security camera show a vehicle registered to you that appears to have violated F.S. 316.1575 and/or 316.1576.

According to national statistics, 96% of all rail-related fatalities and injuries occur at highway rail-grade crossings or while trespassing on railroad property, and most of these collisions can be prevented. According to Florida Statutes, a vehicle must:

- Stop at least 15 feet from a rail crossing when signal lights are activated;
- Not proceed through, around, or under any crossing gate or barrier while the gate or barrier is closed or is being opened or closed; and
- Not enter the crossing without sufficient space or undercarriage clearance to drive completely through the crossing without stopping.

As motorists, we need to always be prepared to stop at the railroad crossing; slow down, look both ways, listen; obey warning devices; and check that you have enough room on the other side of the tracks for your vehicle to cross safely. Finally, you should never race a train, and never stop on tracks. Through the City of Orlando, Orlando STOPS Railroad Crossing Safety Initiative campaign, in collaboration with the U.S. Department of Transportation Federal Railroad Administration, SunRail and Sensys America, Inc, we are working to increase awareness of this serious potential safety hazard.

At your earliest convenience, we would appreciate your assistance by participating in a brief survey, which we will use to further evaluate the effectiveness of this pilot program and improve safety at railroad crossings. Please take a moment to complete the survey that is available on line at:
https://www.surveymonkey.com/r/orlandostopsrailroad

Thank you for your attention to this matter.

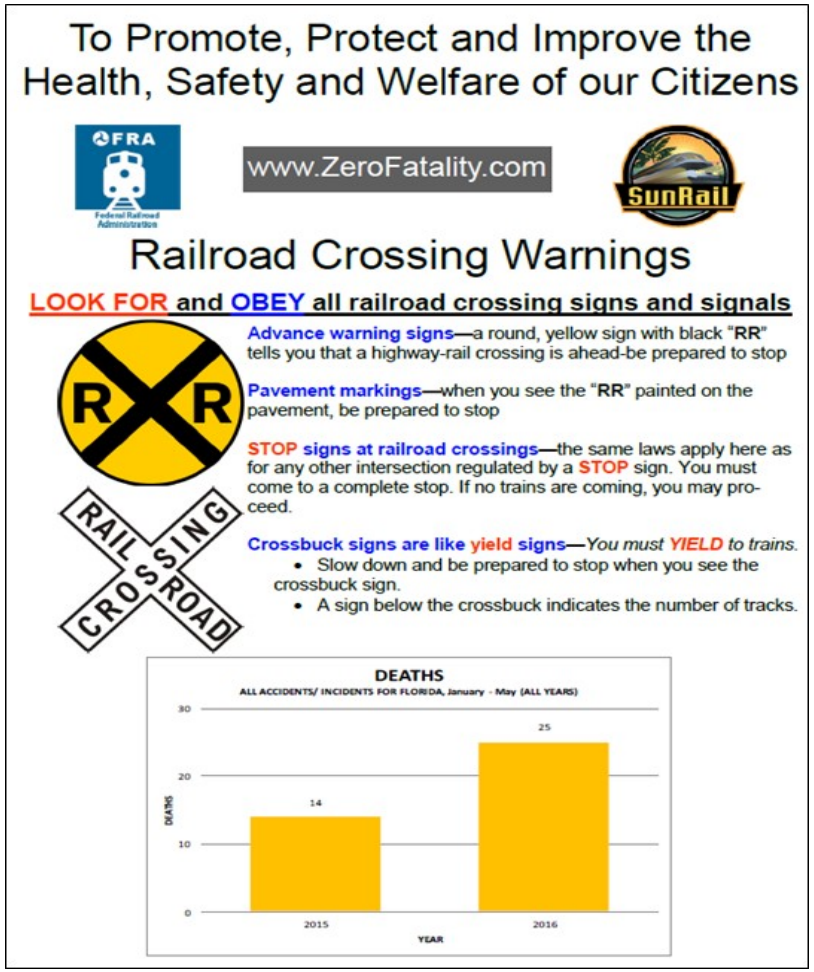
Sincerely,

ORLANDO STOPS
407-246-2060
The City of Orlando cares about your safety.

VIEW YOUR VIOLATION ONLINE:
You may view your images and video online at:
www.ZeroFatality.com
Please enter Plate Number and Password provided below to enter the secure web site.
Plate Number:
Password:

sensys AMERICA

Sensys America, Inc. is proud to provide our **RailRoad-Safe** system to improve the safety of our citizens. www.ZeroFatality.com is powered by Sensys America, Inc. www.sensysamerica.net



To Promote, Protect and Improve the Health, Safety and Welfare of our Citizens

FRA Federal Railroad Administration

www.ZeroFatality.com

SunRail

Railroad Crossing Warnings

LOOK FOR and OBEY all railroad crossing signs and signals

Advance warning signs—a round, yellow sign with black "**RR**" tells you that a highway-rail crossing is ahead-be prepared to stop

Pavement markings—when you see the "**RR**" painted on the pavement, be prepared to stop

STOP signs at railroad crossings—the same laws apply here as for any other intersection regulated by a **STOP** sign. You must come to a complete stop. If no trains are coming, you may proceed.

Crossbuck signs are like yield signs—*You must YIELD to trains.*

- Slow down and be prepared to stop when you see the crossbuck sign.
- A sign below the crossbuck indicates the number of tracks.

RAIL ROAD CROSSING

DEATHS
ALL ACCIDENTS/ INCIDENTS FOR FLORIDA, January - May (ALL YEARS)

Photo-Based Education at Crossings: Survey Results

Why Offenders Drove Through the Crossing During Activation*		
RESPONSE	**COUNT**	**PERCENT OF TOTAL**
I did not see the activated crossing signals (e.g., lights flashing, gate lowering)	139	42%
I felt I had enough time to get through	70	21%
I did not see the train	39	9%
I followed the car in front of me	27	8%
I was unfamiliar with the rules	28	8%
I don't know	23	7%
I was in a rush (e.g., late for an appointment)	17	5%
I felt the wait would be too long	7	2%
No Answer	7	2%
Other	62	19%
Total	**419**	**100%**

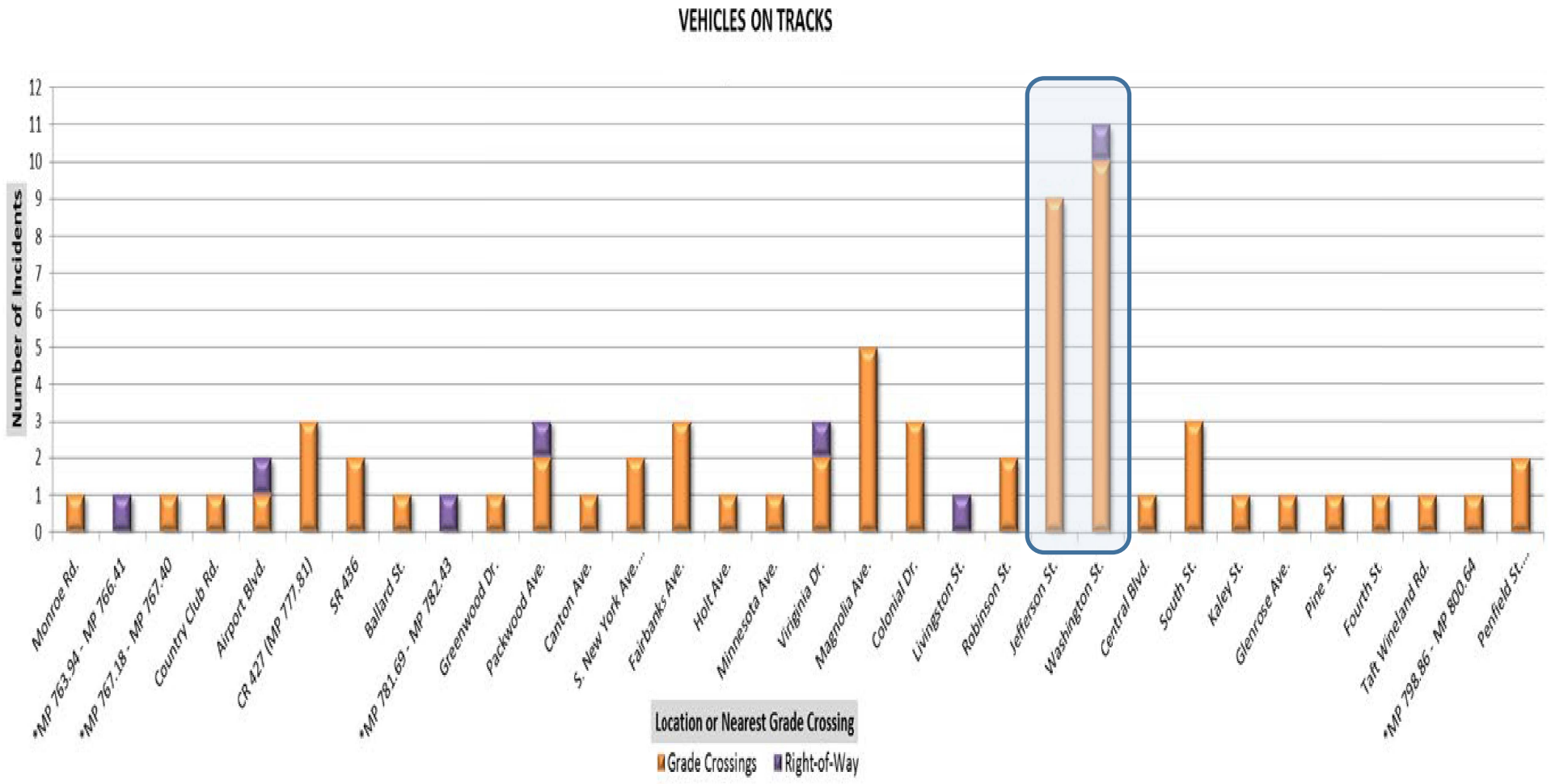
*Respondents were instructed to "check all that apply."

2. Vehicle Right-of-Way (ROW) Incursion Prevention

Project Description

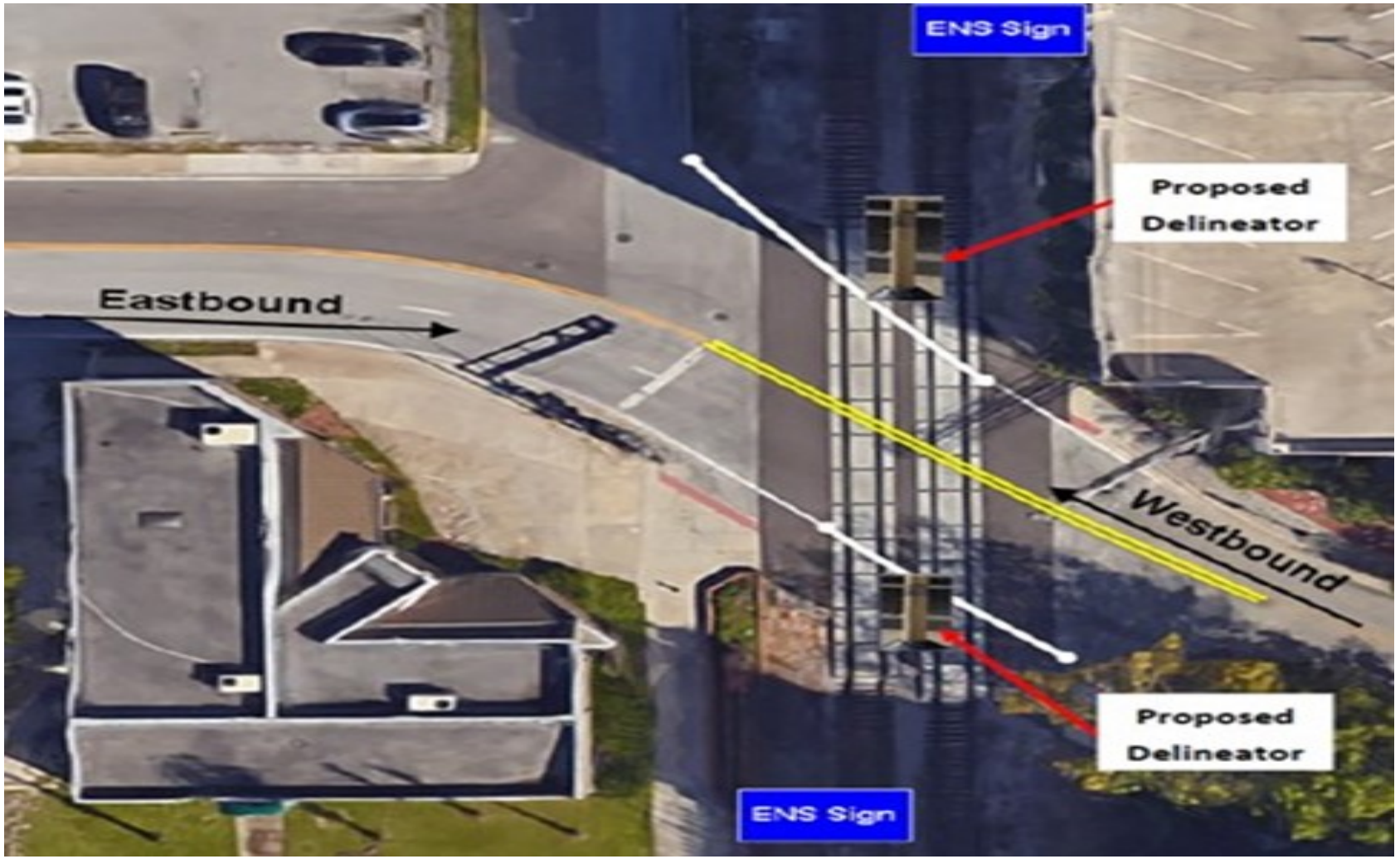
- Study interventions to prevent vehicle incursions into railroad rights-of-way
- Install and evaluate low-cost site-specific strategies
- Location: Orlando, Florida

Vehicle Right-of-Way Incursion Prevention: Vehicle-on-Tracks Incidents (Jan 2014 – June 2016)



Vehicle Right-of-Way Incursion Prevention

Vehicle Right-of-Way Incursion Prevention



Vehicle Right-of-Way Incursion Prevention

3. Real-Time Railroad Crossing Information System for Emergency Vehicle Drivers

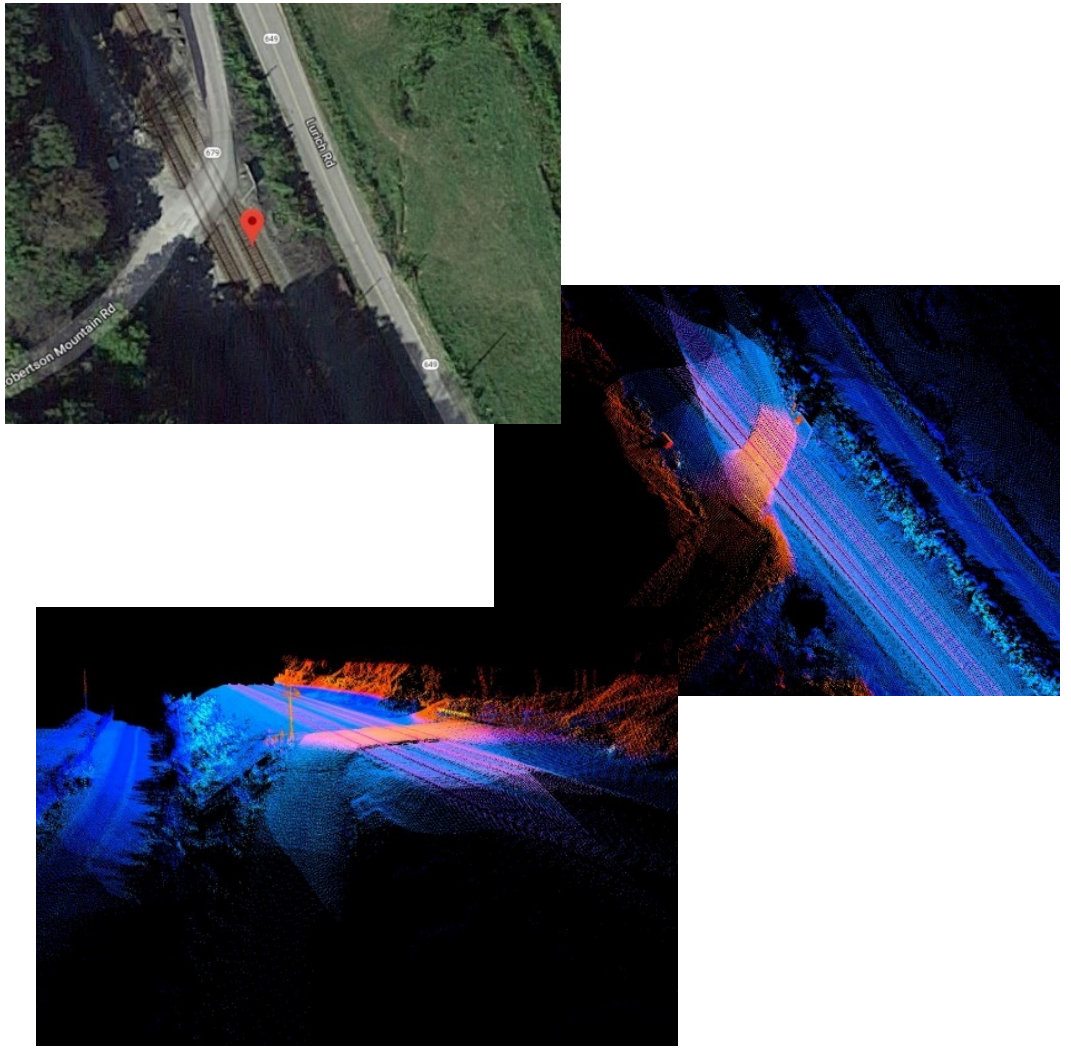
Project Description

- Develop an in-vehicle notification system to alert emergency vehicle operators when rail crossings are blocked
- The system will:
  - Help emergency service vehicle drivers avoid blocked crossings, and
  - Re-route vehicles to save response time
- Models will use GPS data from emergency vehicles and actual railroad crossing blockage data to measure and quantify the benefits of real-time information on emergency vehicle response times

4. Enhanced Humped Crossing Database Using LiDAR

Project Description

- Enhance FRA's National Grade Crossing Inventory database by including LiDAR (Light Detection and Ranging) point clouds of humped crossings
- Develop and test a quasi real-time alerting system if a humped crossing is detected and not reported as such
- Verify data reported to the National Grade Crossing Inventory database



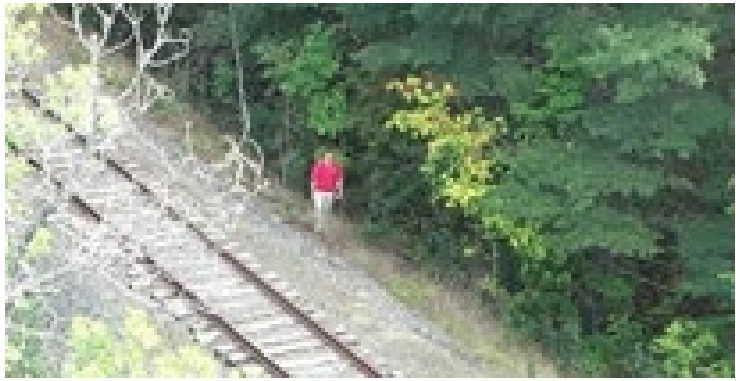
5. Trespass Detection and Warning – Drone System

Project Description

- Test the effectiveness of drone technology to detect trespassers on railroad property
- Mobile camera deployed on a drone by police
  - Provides significant coverage over the ROW in the project location when in use
  - Identifies and tracks trespassers in areas of the ROW difficult to access by the police

Potential Outcomes

- Reduce trespass frequency through detection and education of trespassers on right-of-way (ROW)
- Document best practices and lessons learned
- Possibility for nationwide application



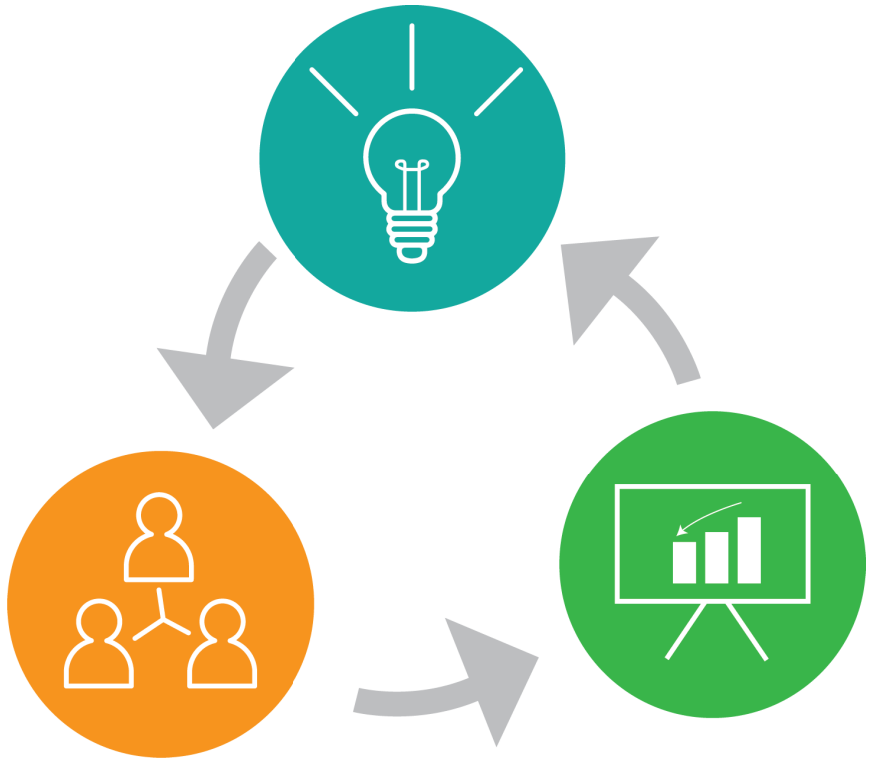
Stakeholder Engagement: 2017 Grade Crossing Research Needs Workshop

- Workshop to collaborate, identify, and prioritize specific research needs
- 150+ attendees: Federal, state, and local governments; railroad industry, academia, and consultants
- Five topic areas:
  - Engineering/Technologies
  - Human Factors
  - Community Outreach/Education
  - Enforcement
  - Hazard Management
- *Technical Report* of conference proceedings: https://www.fra.dot.gov/eLib/details/L19857

Site URL:
https://www.fra.dot.gov/conference/2017/rnw/presentations.shtml

Stakeholder Engagement: Grade Crossing Listening Sessions

- FRA held six listening sessions with following stakeholder groups between March and April 2019:
  - Railroads
  - Signal Equipment Manufacturers
  - Trade & Advocacy Groups
  - Technology Companies
  - Federal, State, Local Governments, and DOT Modes
  - Law Enforcement
- Topics discussed: Demonstrated and emerging technologies, barriers to implementation, and ideas for regulatory changes



Contact Us

Federal Railroad Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

For more information visit us at
www.fra.dot.gov

Connect with us **USDOTFRA**

U.S. Department of Transportation
Federal Railroad Administration