

# FHWA Roadway Departure Initiatives

*Working Together to Save Lives*

*Camille Otto  
Acting Director of Technical Services  
December 13, 2019*



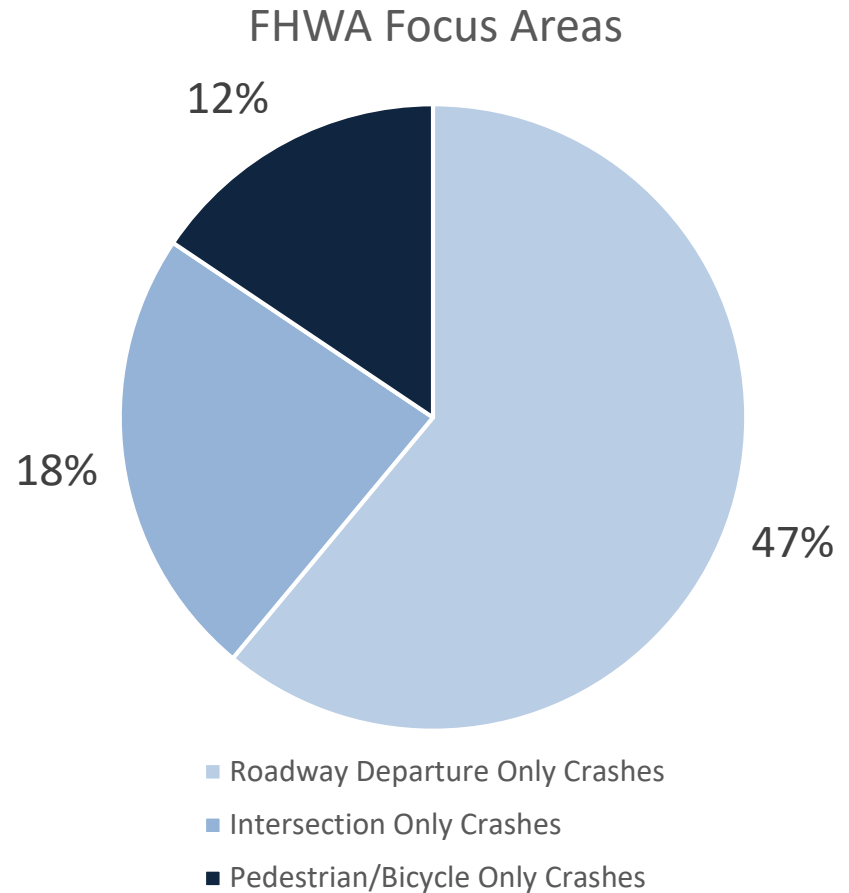
U.S. Department of Transportation  
**Federal Highway Administration**



<http://safety.fhwa.dot.gov>

# Saving Lives – A National Priority

- Every 14 minutes someone is killed on American highways.
- Fatalities dropped 2.4% percent:
  - 2017 – 37,473 fatalities.
  - 2018 – 36,560 fatalities.



# What is a Roadway Departure (RwD)?

3

- A crash in which a vehicle crosses an edge line, a center line, or otherwise leaves the traveled way.

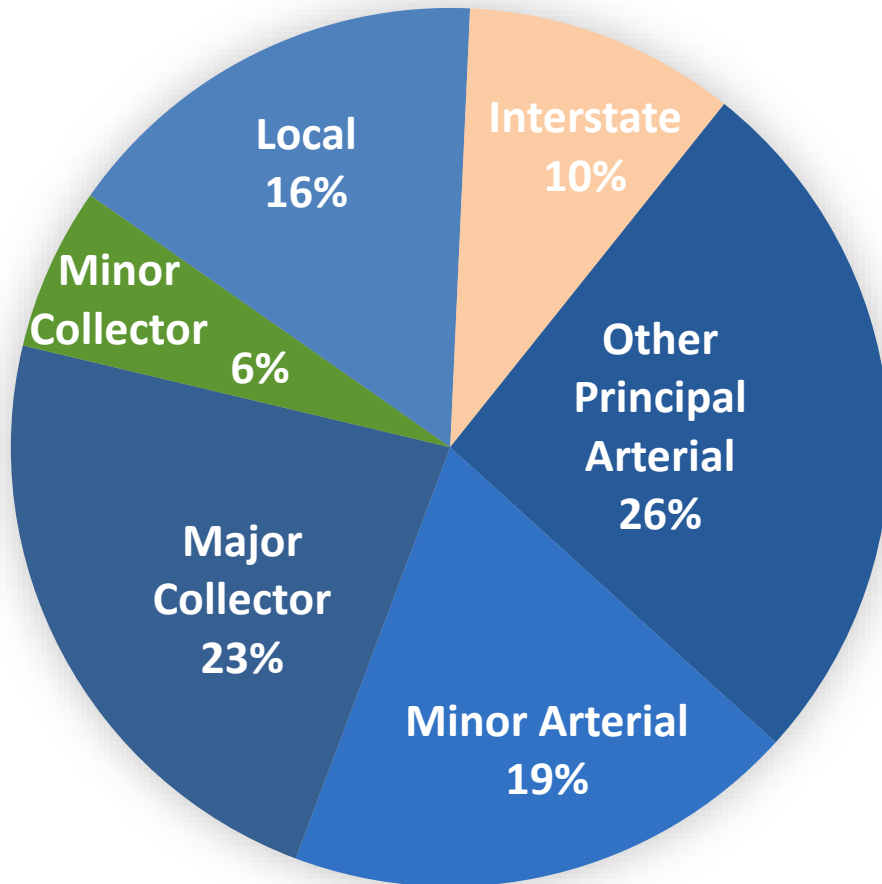


# The Rural RwD Component of Fatalities



Source: NHTSA FARS (2014 – 2016 Annual Average)

# Why All Public Roads?



Roads typically maintained by states = 55% of Rural RwD fatalities

Roads typically maintained by locals = 45% of Rural RwD fatalities

2014-2016 Annual Average of Rural Roadway Departures

Source: FARS

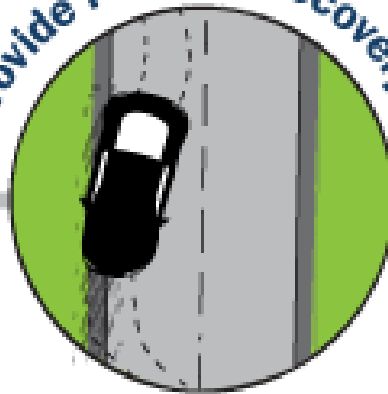
# Roadway Departure Safety Program

## COUNTERMEASURES

Keep Vehicles on Roadway



Provide for Safe Recovery

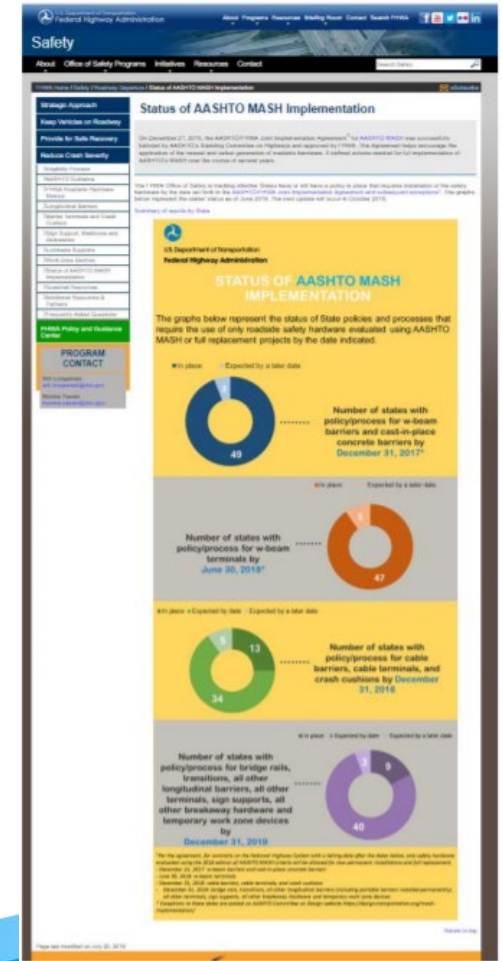


Reduce Crash Severity



# Status of AASHTO MASH Implementation

- AASHTO/FHWA Joint Implementation Agreement for [AASHTO MASH](#)
- Agreement helps encourage the application of the newest and safest generation of roadside hardware.
- Office of Safety is tracking whether States have or will have a policy in place that requires installation of the safety hardware by required dates. (Updated Quarterly)



# AASHTO/FHWA Joint Implementation Agreement on AASHTO MASH



Per the agreement - letting dates for MASH tested hardware:

- **December 31, 2017:** w-beam barriers and cast-in-place concrete barriers
- **June 30, 2018:** w-beam terminals
- **December 31, 2018:** cable barriers, cable terminals, and crash cushions
- **December 31, 2019:** bridge rails, transitions, all other longitudinal barriers (including portable barriers installed permanently), all other terminals, sign supports, all other breakaway hardware, and temporary workzone devices.



# Nov. 2019 Q&A's – Flexibility

States may specify MASH 2009-compliant or NCHRP 350-compliant devices when:

- a) a MASH 2016-compliant device does not exist to address the situation;
- b) a MASH 2016-compliant device exists but does not meet the state's needs given project or regional conditions;
- c) the state is awaiting completion of MASH-2016 testing for a specific device, in which case the State must document the plan for testing the device that will be used on future projects in lieu of the specified NCHRP 350 device;
- d) the device is a temporary work zone device that has been in use prior to December 31, 2019, and is still within its normal service life.

# AASHTO/FHWA Technical Working Group

- Q&As regarding AASHTO MASH & Implementation
- Changes to MASH implementation dates and clarification to MASH are posted on the AASHTO Committee on Design website



For more: <https://design.transportation.org/mash-implementation/>

# Clarifications of the Agreement and more...

For more & future documents:

AASHTO Committee on Design

<https://design.transportation.org/mash-implementation/>

FHWA Roadside Hardware Policy Memos & Guidance

[https://safety.fhwa.dot.gov/roadway\\_dept/countermeasures/reduce\\_crash\\_severity/policy\\_memo\\_guidance.cfm](https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/policy_memo_guidance.cfm)

# In-Service Performance Evaluation (ISPE)

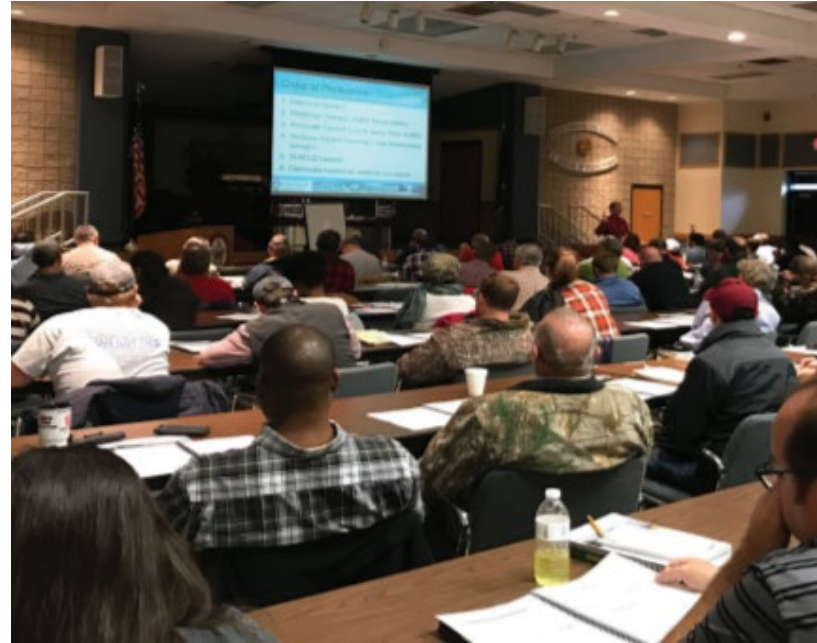
- ISPE Peer Exchange held November 2019 (CA, TN, AZ, SC, PA & PA Turnpike, UT)
- ISPE Peer Exchange held August 2018 (WA, SC, TX, MO, FL, VA, MN, IA).
- Take-aways:
  - States very interested in ISPE to support decisions
  - Sharing data, clearinghouse, pooled fund and learning from other states
  - Looking at best tools to capture the existing inventory

For more info and ISPE resources:

[https://safety.fhwa.dot.gov/roadway\\_dept/countermeasures/reduce\\_crash\\_severity/guardrail\\_ispe.cfm](https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/guardrail_ispe.cfm)

# Fast Act Guardrail Training

- Customized to State Practices and Policies
- Develop materials for selection, design, installation, and maintenance
- Establish a mentor program



Brochure -

[https://safety.fhwa.dot.gov/roadway\\_dept/countermeasures/reduce\\_crash\\_severity/docs/FAST-act-brochure-update7-19.pdf](https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/docs/FAST-act-brochure-update7-19.pdf)

# Guardrail Training

## 3-day State Specific Training

Received to date	Scheduled
Kansas, Arizona, California, Arkansas, Montana, Washington, Idaho, North Dakota, Indiana	Illinois, Iowa, Colorado, Oregon (TBD)

## Mentoring training

Received to date	Scheduled
Tennessee, Pennsylvania, Delaware, Texas Florida, Arkansas, Montana	Connecticut

## Generic training – not state specific

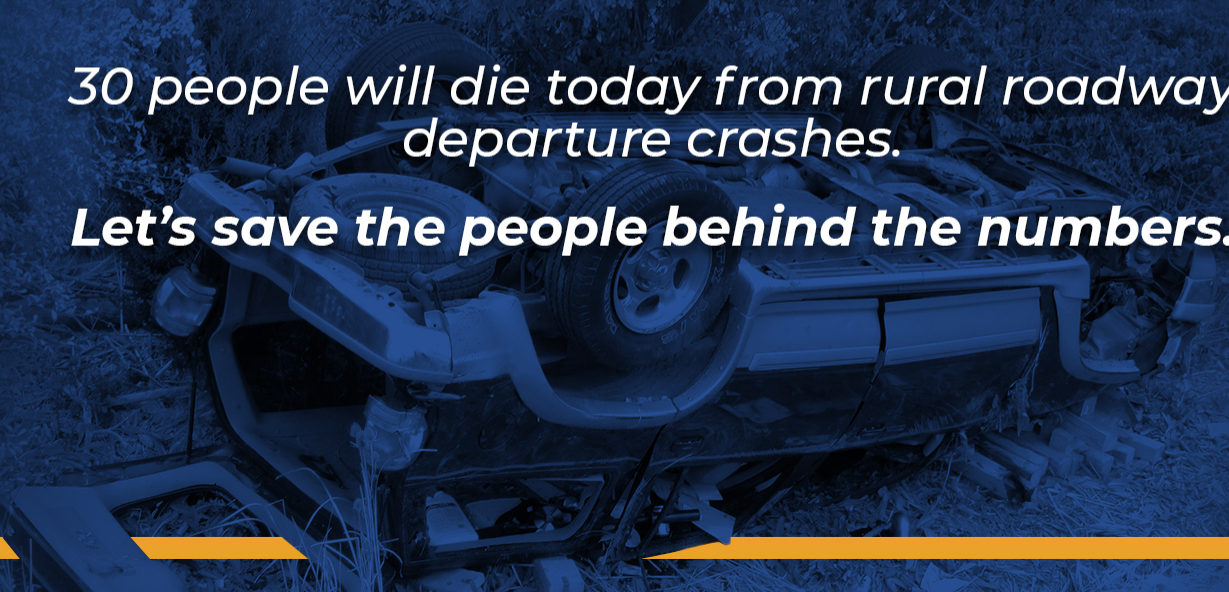
Received to date	Scheduled
Maryland	



U.S. Department of Transportation  
Federal Highway Administration



*30 people will die today from rural roadway  
departure crashes.  
Let's save the people behind the numbers.*



U.S. Department of Transportation  
Federal Highway Administration



**Safe Roads for a Safer Future**  
Investment in roadway safety saves lives

<http://safety.fhwa.dot.gov>

# Focus on Reducing Rural Roadway Departures

## Mission:

Reduce the potential for **serious injury and fatal** roadway departure crashes on all public rural roads by increasing the systemic deployment of proven countermeasures.





# Systemic Analysis



## How Healthy is Your Road System?

Find out with systemic analysis

*Systemic analysis* is like a health screening for your road system. Just as your doctor identifies risk factors for illness, systemic analysis identifies locations that are at highest risk for severe crashes. Practitioners can then prioritize projects based on risk and apply low-cost safety treatments to reduce severe crashes across the whole at-risk system.



CURVE COUNTY - X RAY RESULTS

### Symptoms

Severe roadway departure crashes on curves.

#### Possible Risk Factors:

- Avg. Daily Traffic > 1,000 vehicles
- Curve Radius < 1,000 feet
- Intersection within Curve
- Visual Trap within Curve
- Severe Crash within Curve

### Treatment

Prioritize highest risk sites and treat with low-cost countermeasures such as chevron signs or rumble strips.

### Follow-Up

Track and evaluate safety improvements. Further remediation can be implemented as needed.

### Diagnosis

11% of all curves have 3 or more risk factors.

#### Lab Results:

- Curve A
- Curve B
- Curve C
- Curve D
- Curve E

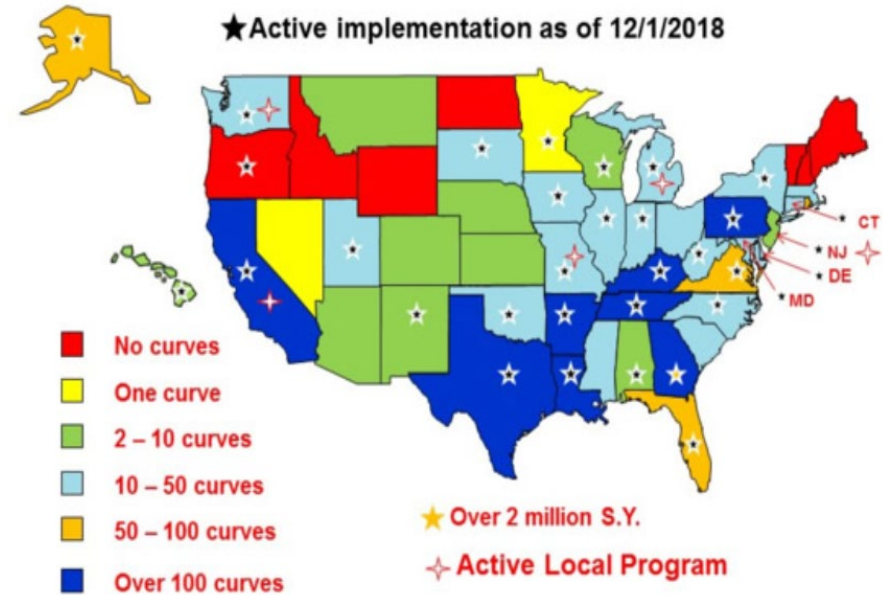
### Systemic vs. Systemwide

Systemic does not mean treating all locations. It allows agencies to treat the highest-risk sites within limited budgets.



# High Friction Surface Treatment (HFST)

- HFST and Continuous Friction Measurement Peer Exchange – 12/19
- Resources Available on FHWA's website



# FHWA Proven Safety Countermeasures



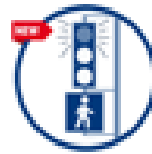
Roadside Design Improvement at Curves



Reduced Left-Turn Conflict Intersections



Systemic Application of Multiple Low Cost Countermeasures at Stop-Controlled Intersections



Leading Pedestrian Interval



Local Road Safety Plan



USLIMITS2



Enhanced Delineation and Friction for Horizontal Curves



Longitudinal Rumble Strips and Stripes on Two-Lane Roads



Median Barrier



Safety Edge<sup>TM</sup>



Backplates with Retroreflective Borders



Corridor Access Management



Dedicated Left- and Right-Turn Lanes at Intersections



Roundabouts



Yellow Change Intervals



Medians and Pedestrian Crossing Islands in Urban and Suburban Areas



Pedestrian Hybrid Beacon



Road Diet



Walkways



Road Safety Audits

# PSCi – Available Resources

<http://safety.fhwa.dot.gov/provencountermeasures>

- 1-pager marketing flyers.
- Slides from webinar and link to recorded session.
- Links to additional FHWA resources for each item.

**PROVEN SAFETY COUNTERMEASURES**

### Corridor Access Management

Some transportation technologies, such as the connectivity and cell phone usage, have led to an increase in the number of vehicles that are on the roadway at any given time. This increase in traffic volume has led to an increase in the number of crashes that occur on the roadway. Corridor access management is a strategy that can be used to control access to the roadway and reduce the number of crashes that occur on the roadway.

**SAFETY BENEFITS**

- 5-23% Reduction in crashes
- 25-31% Reduction in total crash costs
- 27% Reduction in total crash fatalities

80% of crashes occur on roads with limited access

For more information on this and other FHWA Proven Safety Countermeasures, please visit <http://safety.fhwa.dot.gov/provencountermeasures>

**PROVEN SAFETY COUNTERMEASURES**

### Roadside Design Improvements at Curves

Roadside design improvements at curves can reduce the number of crashes that occur on the roadway. These improvements include widening the roadway, adding shoulders, and installing guardrails. These improvements can help to reduce the number of crashes that occur on the roadway and improve the safety of the roadway.

**SAFETY BENEFITS**

- 27% Reduction in total crash fatalities
- 80% of crashes occur on roads with limited access

For more information on this and other FHWA Proven Safety Countermeasures, please visit <http://safety.fhwa.dot.gov/provencountermeasures>

**PROVEN SAFETY COUNTERMEASURES**

### Local Road Safety Plans

Local road safety plans can improve the safety of local roads. These plans include a variety of measures, such as widening the roadway, adding shoulders, and installing guardrails. These measures can help to reduce the number of crashes that occur on the roadway and improve the safety of the roadway.

**SAFETY BENEFITS**

- 46% Reduction in total crash fatalities
- 56% Reduction in total crash costs

For more information on this and other FHWA Proven Safety Countermeasures, please visit <http://safety.fhwa.dot.gov/provencountermeasures>

**PROVEN SAFETY COUNTERMEASURES**

### Medians and Pedestrian Crossing Islands in Urban and Suburban Areas

Medians and pedestrian crossing islands can improve the safety of urban and suburban areas. These measures include widening the roadway, adding shoulders, and installing guardrails. These measures can help to reduce the number of crashes that occur on the roadway and improve the safety of the roadway.

**SAFETY BENEFITS**

- 46% Reduction in total crash fatalities
- 56% Reduction in total crash costs

For more information on this and other FHWA Proven Safety Countermeasures, please visit <http://safety.fhwa.dot.gov/provencountermeasures>

**PROVEN SAFETY COUNTERMEASURES**

### SafetyEdge

SafetyEdge can improve the safety of roads. This measure involves installing a safety edge on the roadway, which can help to reduce the number of crashes that occur on the roadway and improve the safety of the roadway.

**SAFETY BENEFITS**

- 11% Reduction in total crash fatalities
- 5% Reduction in total crash costs

For more information on this and other FHWA Proven Safety Countermeasures, please visit <http://safety.fhwa.dot.gov/provencountermeasures>

**PROVEN SAFETY COUNTERMEASURES**

### USLIMITS2

USLIMITS2 can improve the safety of roads. This measure involves installing a safety edge on the roadway, which can help to reduce the number of crashes that occur on the roadway and improve the safety of the roadway.

**SAFETY BENEFITS**

- 11% Reduction in total crash fatalities
- 5% Reduction in total crash costs

For more information on this and other FHWA Proven Safety Countermeasures, please visit <http://safety.fhwa.dot.gov/provencountermeasures>

# Questions

