

# SAFETY COMPASS

## NEWSLETTER



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### A Message from FHWA Associate Administrator for Safety Beth Alicandri

#### The Long View – The FHWA 2019-2022 Strategic Plan



The mission of the Federal Highway Administration is to enable and empower the strengthening of a world-class highway system that promotes safety, mobility, and economic growth, while enhancing the quality of life of all Americans. FHWA will work closely with our partners and stakeholders to continue our quest to eliminate traffic-related deaths on our Nation’s highways and roads. To help guide us toward zero deaths, early last fall the agency issued the

FHWA Strategic Plan FY2019-2022.

In addition to reiterating the agency’s mission, the Strategic Plan outlines FHWA’s values, strategic goals, and strategic objectives, aligning our efforts with the strategic goals for safety, infrastructure, innovation, and accountability in the [FY 2018–2022 USDOT Strategic Plan](#). Developed to complement and support the USDOT Strategic Plan, the FHWA Strategic Plan also describes key programs, initiatives, and performance measures associated with each of the FHWA strategic goals and objectives.

At the Office of Safety, our highest priority goal is to reduce transportation-related fatalities and serious injuries across the transportation system, and this new plan will help us accomplish that as we continue to advance performance-driven highway safety management practices and further advocate for the deployment of innovative safety countermeasures. We will reach our goal by:

- Doubling down on what works through proven, evidence-based strategies and solutions such as the new EDC-5 Reducing Rural Roadway Departures resources (see [page 3](#)) and the new tools for improving vulnerable road user safety (see [page 5](#)) and intersection safety (see [page 12](#)).
- Advancing life-saving technology in vehicles and infrastructure, such as using connected and autonomous vehicles to reduce roadway departure crashes (see [page 20](#)) and using high-friction surface treatments to keep vehicles on the road (see [page 10](#)).
- Prioritizing safety by adopting a safe systems approach and creating a positive safety culture (see [page 9](#)).

If you haven’t yet reviewed the many resources that support State, local, Tribal, and other safety partners’ efforts in these areas, I encourage you to do so today by reading the related stories on the pages referenced above. To learn more about FHWA’s strategic goals, we invite you to download the new [FY 2019-22 FHWA Strategic Plan](#).

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## 2018 SAFETY DISCIPLINE CONFERENCE SUMMARY

By: Rosemarie Anderson, Lincoln Cobb, Felix Delgado, Thomas Elliott, Alan Ho, Karen King, Juan Balbuena-Merle, Isbel Ramos-Reyes, Jessica Rich, and Keith Sinclair, FHWA

In early August, highway safety practitioners from across the country came to Baltimore, Maryland, for the 2018 Safety Discipline Conference. For 2 days, about 100 Federal employees from across the organization (headquarters staff, divisional staff, Federal lands staff, and staff from Turner Fairbank Highway Research Center) convened to share information on highway safety-related topics through presentations, workshops, and informal networking.

The conference kicked off with a message from then FHWA Acting Executive Director Cheryl Walker and Associate Administrator for Safety Beth Alicandri highlighting the important role safety plays in the overall FHWA mission of eliminating fatalities and injuries on the roadways. After a networking session, participants broke into technical sessions based on a variety of topics across the safety discipline, including State safety reporting, highway design and infrastructure, funding, innovations in connected and automated vehicles, pedestrian and bicycle safety, and speed management, all developed by teams of subject matter experts.

Additionally, throughout the conference, participants were randomly assigned to teams to solve an assigned challenge. The three challenges included:

1. Programs Track – Thinking beyond the HSIP / SHSP by injecting safety everywhere.
2. Infrastructure Track – Identifying the role of infrastructure in facilitating safe and efficient deployment of automated vehicles.
3. Innovation Track – What should be the next big step in safety?

Following the conference, the challenge teams presented their solutions in a series of webinars from October through December. These solutions included ideas on how safety can be incorporated



Field Safety Engineer attendees at the 2018 Safety Discipline Conference. Source: FHWA



Summit facilitators introduced an element of fun by encouraging attendees to toss the beach ball to the person who had the floor to ask or answer a question. Source: FHWA

into the areas of programs, infrastructure, and innovation.

The triennial Safety Discipline Conference allows staff to join together with peers, brainstorm potential solutions, and exchange ideas and information on topics related to their areas of expertise and interest throughout the safety discipline. The next in-person safety conference is anticipated to occur in 2021.

## SAFETY FOCUS AREA: ROADWAY DEPARTURE CRASHES

## EDC5 AIMS TO BAT ONE OUT OF THE PARK WITH FOCUS ON RURAL ROAD SAFETY

*By: Cate Satterfield, FHWA Office of Safety, Co-Lead for EDC-5 Reducing Rural Roadway Departures*

While less than 20 percent of the U.S. population lives in rural areas, NHTSA data shows that more than half of roadway fatalities occur on rural roads.<sup>1</sup> Further, fully two-thirds of these rural fatalities involved a roadway departure (RwD), where a vehicle crosses a center line, an edge line, or otherwise leaves its travel lane. This means that not only are deaths on rural roadways severely overrepresented, so are fatalities and serious injuries related to RwD crashes—quite a curveball!

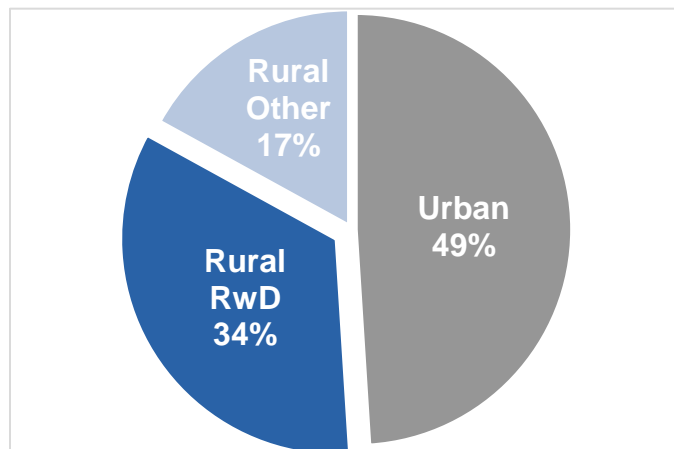
To address this considerable safety issue on the Nation's rural road systems, FHWA has selected "Reducing Rural Roadway Departures" as 1 of the 10 innovations that are the focus of round 5 (2019-2020) of the [Every Day Counts \(EDC-5\)](#) initiative.

"We want States, locals, Tribes, and Federal agencies to consider that they can do more, and we want to show them how a data-driven systemic approach can help them proactively reduce the risk of future crashes," said Karen Scurry, FHWA Office

FHWA and EDC-5 have identified proven RwD countermeasures that can help States improve their game when it comes to rural road safety:

- **Barriers** reduce the severity of crashes that occur on your roadways.
- **Clear zones** reduce the potential for a crash when a driver leaves their lane.
- **Rumble strips** help keep drivers in their lane.

By systemically applying these "heavy hitters," local agencies will find they are covering all the bases when it comes to reducing RwD crashes!



*While less than 20 percent of the U.S. population lives in rural areas, NHTSA data shows that more than half of roadway fatalities occur on rural roadways.*

of Safety HSIP Program Manager and a core member of the team for this EDC effort.

"When a batter comes up to the plate, he puts on a batter's helmet," said Dick Albin, the FHWA Resource Center Co-Leader for the EDC effort, who turned to a baseball analogy to emphasize the importance of factoring the element of risk when addressing safety. "That batter may have never been hit with a pitch, but he knows this is a high-risk location—he's facing a baseball traveling nearly 100 mph—and there is potential for life changing consequences, so he takes this precaution of wearing a helmet. Similarly, the systemic approach to safety looks for high-risk locations where countermeasures can be applied to reduce the potential risk of a crash."

### The Systemic Approach to Roadway Departures

Agencies can use a variety of tools to analyze and prioritize the locations and countermeasures that will be most effective in keeping vehicles in their travel lanes, reducing the potential for crashes when vehicles do leave the roadway, and minimizing the severity of those crashes that do occur. The systemic or risk-based approach identifies treatment locations based on a set of common risk factors rather than solely based on crash data. This is an important consideration since many rural roadways have lower average daily traffic rates than urban areas do, and crash data do

not always indicate concentrations of Rwd crashes. Further, agencies can develop safety action plans for addressing high-risk locations systemically even if they have limited data. By addressing locations with high risk rather than all roads, the limited funds available can be used most effectively.

From October-November 2018, FHWA conducted a series of five regional EDC summits where innovation champions from around the country came to learn about deploying innovations; exchange ideas with their State, local, and industry counterparts; and provide feedback to FHWA on the support and resources needed to adopt the innovations.

Beginning in 2019, FHWA will begin working to provide training, technical assistance, and resources to assist agencies with their rural roadway departure strategies. In many cases that will probably begin with developing Rural Road Safety Action Plans that are in sync with the State's Strategic Highway Safety Plan (SHSP). Many Tribes and some counties already have plans in place and are reaping the safety benefits as a result. These plans often provide the justification that makes it easier to access available funding. For instance, Highway Safety Improvement Program (HSIP) funds are available for use on all public roads. Minnesota and Washington are two States that have set the bar high, proportionally allocating HSIP funds to the types of agencies that are facing high rates of severe crashes, rather than using them exclusively on the State system. Training will also be available on how to conduct a systemic safety analysis using the data and



FHWA's Dick Albin and Tori Brinkly "pitch" the new Reducing Rural Roadway Departures innovation at an EDC5 Regional Summit.

information that agencies have available, even if it is limited. Other outreach efforts will focus on the correct installation of low-cost countermeasures such as chevrons on curves. Train-the-trainer courses and resource packages will focus on ways to involve champions with better connections to these agencies, such as Local and Tribal Technical Assistance Programs (LTAP/TTAP).

"Our goal is for agencies to make informed decisions about when and where to apply countermeasures, sort of like lining up the right pinch hitter," Satterfield joked. "But in all seriousness, our goal is to help agencies reduce roadway departure fatalities and injuries on rural roads. The NHTSA's Fatal Analysis Reporting System (FARS) indicates that nearly 12,000 people annually drive onto a rural roadway but don't make it home because they are killed in a roadway departure crash. Everybody can do more, and sometimes the way we can do that is by making more effective use of the data and resources we've got."

Interested in learning more or getting started using the EDC5 "Reducing Rural Roadway Departures" innovation? Please contact your FHWA Division Office Safety Specialist today!

<sup>1</sup> NHTSA, "Traffic Safety Facts – 2016 Data – Rural/Urban Comparison of Traffic Fatalities." DOT HS 812 521, April 2016. Available at: <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812521>



Available to attendees at the regional summits, a set of All-Star Roadway Departure Counter-measures are featured on Trading Cards that offer a quick explanation of their use and effectiveness. Gum included!

## SAFETY FOCUS AREA: VULNERABLE ROAD USERS

### STEP, STATES DEVELOP ACTION PLANS FOR PEDESTRIAN SAFETY AT UNCONTROLLED CROSSINGS

*By: Becky Crowe, FHWA Office of Safety*

Over the past 12 months, the leadership of 22 State departments of transportation (DOTs) met with representatives from FHWA in a series of 1-day, face-to-face meetings to develop policy, planning, design and programmatic recommendations for improving pedestrian safety at uncontrolled locations. These States sought to advance implementation of the countermeasures promoted by the FHWA Safe Transportation for Every Pedestrian (STEP) program. STEP, an innovation of Every Day Counts, supported these one-day meetings to develop recommendations later compiled into State-specific action plan reports. The States are distributing or posting their reports as they are finalized.

Some States are beginning implementation, while others will consider incorporating recommendations and information from the action plans into future policy updates. For example, the MaineDOT is creating a pedestrian countermeasure toolbox, a recommendation in the State's action plan. When implemented, the recommended actions will help reduce the number and rate of pedestrian crashes, fatalities, and injuries on State highways. If emulated by local transportation agencies, these benefits may also be realized on local roads. The following actions are recommended for inclusion in most action plans:

1. Overarching policy related to safety.
2. Marked crosswalk installation, location, prioritization, and countermeasure selection.
3. Facility design manual updates and expansion.
4. Resurfacing.
5. Training and technical assistance.

The following is a list of recommendations reflective of the results of the one-day meetings. Frequently, the recommendations also included a timeline and identification of who from the DOT would be responsible for implementation.

- *Overarching policy related to safety.* State DOTs recognized that the commitment to pedestrian safety needs to be reflected in all policies, projects, and programs. Strategically, this means looking for opportunities to include guidance for improving pedestrian safety whenever DOT policy, planning, and design documents are revised. It also requires that State funding sources need to be eligible to be used for pedestrian safety improvements. Here is an example of a typical policy recommendation:

*The commitment to safety, as articulated in the DOT Vision, Mission, and Goals statement, should be reflected in all DOT policies, projects, and programs. This includes giving priority to funding safety projects and using best design practices when making improvements.*

- *Marked Crosswalk Location, Identification, Prioritization, and Countermeasure Selection.* When State DOTs met, they quickly recognized that they needed to embark on a series of sequential steps to reduce crashes involving pedestrians at uncontrolled locations with marked crosswalks. They also recognized that while they were already taking some actions, additional steps would support efforts to reduce pedestrian crashes (each State was different). Example steps and recommendations include:
  - Crash Tracking and Analysis: Continue to collect and map pedestrian-involved crashes on a yearly basis to identify high-crash locations and corridor segments. Develop crash maps and make them available to all DOT divisions so that the divisions can take the map data into consideration when prioritizing projects and programs in each region.
  - Guidelines on installing marked crosswalks: Review and update (and in some cases create) DOT guidelines on installing marked crosswalks at uncontrolled locations.
  - Inventory of marked crosswalks: Identify and complete a detailed inventory of marked crosswalks at uncontrolled locations on State roads.

- **Countermeasure Identification:** Upon completion of the inventory of marked crosswalks at uncontrolled locations, select appropriate STEP countermeasures.
- **Prioritization:** Using [NCHRP 803](#) (or another existing methodology), prioritize locations for improving pedestrian facilities at uncontrolled locations. Agencies should give consideration to dividing recommended improvements into three types of interventions: simple measures, moderately complex measures, and complex measures. The more complex the measure, the more time, money, and coordination among different divisions may be required.
- **Facility Design.** Most of the DOT design manuals reviewed for the action plan meetings were silent on one or more of the recommended STEP countermeasures, and in other cases included out-of-date design guidance. Subsequently, the recommendations that came out of the one-day meeting were very specific to each countermeasure, focusing on using best practices and updating appropriate DOT manuals. Frequently, specific but common DOT manuals were often identified for revision; for example:

*It is anticipated that the following documents will be revised within the next 3 to 5 years:*

- *Roadway Design Manual*
- *Traffic Engineering Standards and Specifications*
- *Roadway Design Standards and Specifications*
- **Resurfacing:** DOTs recognized that implementing pedestrian improvements, including Road Diets, as part of resurfacing projects is a cost-effective way to reduce pedestrian injuries and fatalities. They also recognized the timing challenges that this created. Here is a typical example of a resurfacing recommendation:  
*Continue moving toward a 2-year cycle for the resurfacing program as a strategy for implementing the countermeasures in this plan, identifying the institutional changes needed to insure everyone supports this revised approach.*
- **Training:** Most of the DOTs recognized that they need to continue to look for opportunities to bring

in training courses; especially courses on how to plan for and design pedestrian networks and countermeasures. Training should include new employees as well as engineers, planners and project managers. Several States also recognized the need to look for opportunities to provide training at statewide conferences and traffic safety forums.

- **Technical Assistance:** Finally, most of the DOTs expressed an interest in receiving FHWA technical assistance in the form of best practices, examples from other States, in-depth review of existing guidelines, problem solving along specific corridors, and additional training.

For more information about STEP, visit the [EDC4 STEP Program Page](#) or contact Becky Crowe at [rebecca.crowe@dot.gov](mailto:rebecca.crowe@dot.gov).

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## NEW! FHWA PED/BIKE RESOURCES NOW AVAILABLE!

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### Learn How to Develop Scalable Risk Values and Assess Exposure to Risk

*By: Tamara Redmon, FHWA Office of Safety*

FHWA and other agencies within the U.S. DOT are working together to assist States and localities in improving the safety and connectivity of their bicycling and walking networks. One of the key issues faced by stakeholders is assessing the degree to which exposure to risk changes over time or by location or region.

To help practitioners address this issue, FHWA recently published the [Guide for Scalable Risk Assessment Methods for Pedestrians and Bicyclists](#), which outlines eight sequential steps for developing risk values and describes the scope and nature of each step, including guiding principles. Practitioners can use these scalable risk assessment methods to evaluate pedestrian and bicyclist risk at different geographic scales to inform program and project funding decisions.

An accompanying spreadsheet tool to estimate statewide and metropolitan planning organization (MPO) area non-motorized exposure, which is based on combined data from the American Community Survey and the National Household Travel Survey, will soon be available online. In the meantime, the tool can be obtained by contacting Tamara Redmon at [tamara.redmon@dot.gov](mailto:tamara.redmon@dot.gov).

FHWA is also providing technical assistance through mid-2020 for States, cities, communities, and MPOs interested in implementing these risk assessment and exposure estimation approaches.

In 2017, FHWA also published an online [Synthesis of Methods for Estimating Pedestrian and Bicyclist Exposure to Risk](#). This report summarizes a variety of methods that safety practitioners may use to estimate and evaluate exposure to risk in pedestrian and bicyclist safety analyses.

FHWA hosted and recorded a [webinar](#) on October 10 to showcase and explain the Guide and spreadsheet tool. The webinar outlined and described three basic exposure estimation

approaches for pedestrians and bicyclists: 1) site counts, 2) travel demand estimation models (several different types), and 3) travel surveys. Panelists from the Texas A&M Transportation Institute (TTI), the University of Michigan Transportation Research Institute, and the FHWA shared the new guidance and spent time responding to discussion questions from attendees.

For more information on the guide, training, or technical assistance, contact the project's Principal Investigator Shawn Turner (of TTI) at [s-turner@tti.tamu.edu](mailto:s-turner@tti.tamu.edu) or Tamara Redmon at [tamara.redmon@dot.gov](mailto:tamara.redmon@dot.gov).

## LEARNING TOGETHER

### SYSTEMIC SAFETY ANALYSIS WORKSHOP NOW AVAILABLE!

*By: Karen Scurry, FHWA Office of Safety*

The Systemic Approach to Safety involves implementing improvements widely across a network based on the identification of high-risk roadway features correlated with specific severe crash types. The systemic approach provides a comprehensive method for safety planning and implementation that supplements and complements traditional site analysis. It helps agencies broaden their traffic safety efforts and consider risks as well as crash history when identifying locations to make low-cost safety improvements.

FHWA is now offering a systemic safety analysis workshop, a four-hour, instructor-led course that leads practitioners through the systemic safety analysis process presented in the [Systemic Safety Project Selection Tool](#) (SSPST). The course provides an overview of the Systemic Approach to Safety analysis process and gives safety practitioners a high-level understanding of the SSPST and the resources needed to apply the tool. The instruction focuses on the benefits of the systemic approach to safety as well as how to correctly apply the methodology to identify systemic safety improvement projects through interactive exercises and case studies.

By participating in this course, safety program managers and practitioners will:

- Gain a high level understanding of the systemic approach to safety
- Understand and apply the 4-step systemic safety planning process
- Understand the resources required to conduct systemic safety analysis
- Develop the desire and determination to start or continue systemic safety planning efforts within their agency.

Safety professionals looking to develop local road safety plans or advance systemic safety projects through their Highway Safety Improvement Program are invited to inquire about training for your agency or jurisdiction. To find out more or to host a workshop, please contact Karen Scurry in the FHWA Office of Safety at [karen.scurry@dot.gov](mailto:karen.scurry@dot.gov) or 202-897-7168.

### EDUCATION WILL PAVE THE WAY FOR A SMART, SUSTAINABLE, AND EQUITABLE FUTURE THROUGH THE NATIONAL HIGHWAY INSTITUTE

*By: Thomas S. Elliott, NHI Training Program Manager,  
and Mary Burke, CHIEF Inc.*

We're seeing a seismic shift in the way education is thought about worldwide. For modern employees to keep up with the rapid pace of technological innovation, education must extend beyond graduation. Employers everywhere want to ensure



*Workplace Learning Trends in 2018. Source: Origin Learning, Inc.*

that workers possess the skills necessary for job performance and that their workforce shares a commitment to continuous education.

Gone are the days where one can check the box on school and settle in to a professional position for decades. In this new skills-based economy, everyone in the workforce must keep up with the steep learning curve of a constantly evolving tech landscape. Luckily, the educational ecosystem is evolving too—particularly for adult learners.

The traditional classroom is no longer the only, or even first option, for many professionals. With over 97 percent of the U.S. population between the ages of 18-49 having access to the internet,<sup>1</sup> it's no surprise corporate eLearning has grown by 900 percent<sup>2</sup> in the last 16 years. In fact, it is predicted that by 2019, 50 percent of all education will be delivered online,<sup>3</sup> and transportation professionals are contributing to this growing trend. At the [National Highway Institute](#), the number of distance learning participants has risen year over year and as a result, online participants outnumber classroom participants.

Why is this movement particularly relevant to transportation professionals? Technology-driven innovation means a shorter shelf life for skills and a tightening labor market. With transportation professionals located in every corner of the country, access to physical training centers isn't always possible.

Additionally, for some specialty topics there may only be a handful of subject matter experts in the country. The cost of sending personnel to a training course outside of their locality can be prohibitive,

but the need for investment in innovation is crucial. That's why the [Web-based training NHI offers](#) is a key part of ensuring a "smart, sustainable, and equitable future" for transportation all professionals.

By offering ongoing, easy access to [learning opportunities](#) we're helping bolster the skills of the transportation workforce—and the safety of our Nation's infrastructure system at large. After all, necessity is the mother of invention. In a recent LinkedIn poll, 68 percent of employees indicate they prefer to learn at work,<sup>4</sup> 58 percent prefer to learn at their own pace, and 49 percent prefer to learn at the point of need. That's why NHI is constantly looking for new ways to support our audiences by offering a [variety of instructor-led and Web-based training](#) and looking forward to debuting our new Learning Management System in 2019.

But we won't stop there. With new advancements in the realms of mobile "bite sized" and app-based learning, gamification, AI/VR, and mixed reality, the sky is really the limit in making sure all transportation professionals get access to the ongoing training their careers—and the digital world—demands.

Interested in taking web-based safety training? Browse [NHI's safety course offerings](#), and don't forget to attend our TRB Live! session to hear more about what NHI is doing to lead transportation's training arm.

<sup>1</sup> Statista.com, "Share of adults in the United States who use the internet in 2018, by age group." Available at: <https://www.statista.com/statistics/266587/percentage-of-internet-users-by-age-groups-in-the-us/>. Accessed 11 Oct. 2018.

<sup>2</sup> eLogic Learning, "15 eLearning Trends and Statistics to Know for 2017," March 2, 2017. Available at: <https://ellogiclearning.com/15-elearning-trends-and-statistics-to-know-for-2017/>. Accessed October 11, 2018.

<sup>3</sup> iMod Education, "The Popularity of Online Courses & E-Learning in 2016 Based on Trends & Statistics," July 27, 2016. Available at: <https://www.imodeducation.com/popularity-online-courses-e-learning-2016-based-trends-statistics/>. Accessed October 11, 2018.

<sup>4</sup> LinkedIn, "New Report shows talent development is playing an increasingly strategic role in today's economy," February 27, 2018. Available at: <https://news.linkedin.com/2018/2/linkedin-workplace-learning-report-2018>. Accessed October 11, 2018.



## HOW ARE VISION ZERO, SAFE SYSTEM, AND TRAFFIC SAFETY CULTURE RELATED?

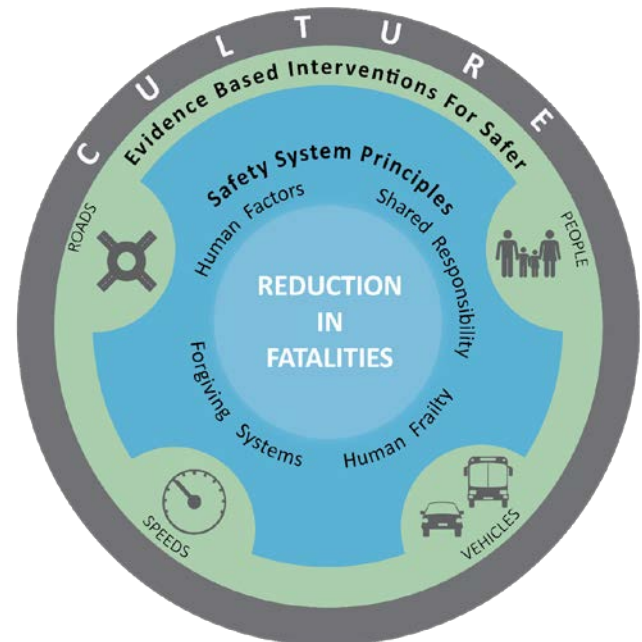
By: Nicholas J. Ward and Jay Otto, Center for Health and Safety Culture, Montana State University, and Brent Jennings (Ret.), Idaho Office of Highway Safety

The recent increase in traffic fatalities on U.S. roads reminds us all of the need to increase our efforts to improve traffic safety.<sup>1</sup> As many States and localities adopt a vision of zero fatalities (and serious injuries), increasingly greater attention is being given to applying a safe systems approach to traffic safety that requires a change in the culture—both amongst road users and traffic safety stakeholder agencies. Any yet, there is perhaps some uncertainty and confusion about how these different concepts relate to each other: Vision Zero, safe systems, and traffic safety culture. This article offers a discussion of the relationships amongst these concepts. By creating a shared understanding of these relationships, we can hope to apply these concepts more effectively to reach our traffic safety goals.

**Vision Zero** is a strategy to eliminate all traffic fatalities and serious injuries. It declares that “zero” is the only acceptable number of traffic fatalities and serious injuries. This vision is motivated by the widely shared value of protecting the health and safety of every road user, motorized and nonmotorized alike. Vision Zero makes explicit that death and injury from traffic crashes are unacceptable in our society.

*Vision Zero is our target. Safe systems is our approach for reaching that target. Safety Culture includes the values, beliefs, and attitudes shared by stakeholders that ensure we succeed together.<sup>2</sup>*

The **safe systems** concept refers to an intentional approach for achieving Vision Zero. It recognizes that humans make mistakes, and we can only achieve Vision Zero by integrating safety improvement efforts amongst all traffic safety stakeholders (road designers, vehicle manufacturers, policy makers, enforcement agencies, families, workplaces, schools, etc.) to create a safe system. A safe systems approach is



*Illustration of the safe systems approach.*

Source: Based on <https://roadsafety.gov.au/nrss/safe-system.aspx>

one in which practitioners work to design, build, and maintain a transportation system that promotes safe road user behaviors (human factors) and protects all road users from physical harm (forgiving systems). All stakeholders in this system are responsible for reducing crashes (shared responsibility).

The U.S. DOT defines a **safety culture** as *the shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands*. **Traffic safety culture** encompasses the values, assumptions and beliefs that influence road user behaviors and stakeholder actions. Communities with a robust safety culture have citizens who understand the risks associated with transportation and choose to make safe choices when using the transportation system.

The FHWA also recognizes that transportation agencies have an organizational safety culture. The extent to which safety is valued and pursued by transportation agency indicates the strength of that organization's safety culture.

As social beings, we are naturally motivated to choose behaviors consistent with the culture of the groups with whom we identify. Thus, our behaviors

and actions are influenced by our shared culture with the groups to which we belong (families, friends, workplaces, agencies, communities, etc.). In this case, our goal is to cultivate a strong and consistent safety culture that promotes safe road user behavior. By growing a strong safety culture, safe road user behavior is reinforced and sustained by the social environment.

**Vision Zero** and the **safe systems** approach are also based on a specific set of values, assumptions, and beliefs. For example, Vision Zero values safety above all other priorities. The belief underlying the safe systems approach is that Vision Zero can only be achieved by integrating traffic safety efforts that include growing a strong safety culture to motivate the integration of safety efforts, applying appropriate speed management policies, and engineering safer roads and vehicles. At the core of Vision Zero is the need for safe behavior by all road users. Thus, an important function of **safety culture** is for transportation stakeholders to measure road user culture and develop strategies that transform this culture to encourage and sustain safer behaviors. Necessarily, this will result not only in road users choosing to be safer themselves, but also helping other people become safer too.

To be implemented successfully, the **safety culture** among public stakeholders must align with these same values and beliefs, and stakeholders must recognize that traffic safety culture is a key component of the safe systems approach. A strong safety culture within a DOT is necessary to

motivate the allocation of resources and planning needed to support the full range of innovative strategies that align with Vision Zero. Thus, growing a strong safety culture ensures that safety is considered during the process of making decisions about any portion of the roadway transportation network. It also creates a context for the acceptance of Vision Zero and the safe systems approach.

To assist transportation agencies with the growth and alignment of a safety culture, the Montana State University's [Center for Health and Safety Culture \(CHSC\)](#) is starting a collaborative project with a cohort of State DOTs and other stakeholder organizations. The goal is to help these organizations to grow a strong and innovative organizational safety culture, which encourages new resources and novel strategies to work towards the elimination of fatal and serious injury crashes. A cohort approach distributes costs and leverages shared learning so the project is more cost-effective for participating agencies. Interested organizations are invited to contact Brent Jennings at [borisjennings@gmail.com](mailto:borisjennings@gmail.com) or 208-859-5459.

<sup>1</sup> National Safety Council, "2017 Estimates Show Vehicle Fatalities Topped 40,000 for Second Straight Year," (n.d.). Available at: <https://www.nsc.org/road-safety/safety-topics/fatality-estimates> (accessed November 14, 2018).

<sup>2</sup> For more information on Safe Systems, see <https://www.transportation.gov/utc/new-safety-utc-envisions-safe-systems-approach-us-roadways>; on Vision Zero, see <http://www.towardzerodeaths.org>; and on Traffic Safety Culture, see <https://safety.fhwa.dot.gov/zerodeaths/>.

## SUPPORTING THE STATES AND TRIBES: FEDERAL AID PROGRAMS

### ASAP FUNDS HFST OPEN HOUSE IN ALABAMA

*By: Joseph Cheung, FHWA Office of Safety*

**The Accelerating Safety Activities Program** (ASAP) specifically supports the goal of promoting safety innovation through training, outreach, and education focusing on roadway departure, intersection, pedestrian, and bicycle safety. The program also promotes partnerships between the FHWA, State, and local transportation agencies, and Local and Tribal Technical Assistance

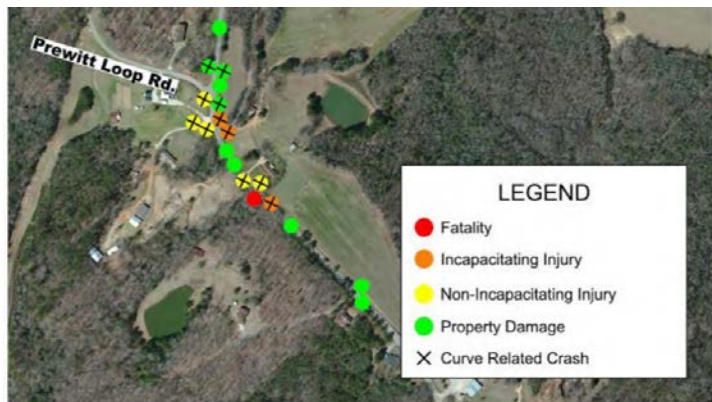
Programs. Currently, ASAP funding is limited to the 23 States that are eligible to participate in the [Focused Approach to Safety](#).

This is the 12th consecutive year in which ASAP is assisting States with implementing innovations in safety. The program has awarded a total of 11 projects from 8 States for FY 2018. Among the grant awardees is the Alabama DOT, which received grant funding to conduct two High Friction Surface Treatment (HFST) demonstrations and follow-on open houses to showcase the HFST treatment for State and local DOTs. Each of the HFST demonstrations and open houses started

with an overview of the HFST technology followed by an HFST installation at the selected site. Demonstrations concluded with a question and answer session.

The first location to receive treatment is near the intersection of Maysville Road and Cooper Drive in Madison County near the City of Huntsville. This site experienced at least 10 crashes in the past 5 years, 2 of which caused incapacitating injuries. For this installation, Madison County government funded the milling and resurfacing activities needed to prepare the road for the HFST treatment, while the ASAP grant is funding the actual HFST treatment and the demonstration activities.

Pointing to a 90 percent reduction in crashes experienced at locations in Georgia where the treatment was applied, Madison County Commissioner Craig Hill is hopeful that installing HFST will result in similar crash reductions in Alabama.



The second location slated to receive an HFST treatment is north of Tuscaloosa on SR-171 at MP 5 at Prewitt Loop Road.

The second location that received an HFST treatment is north of Tuscaloosa on SR-171 at MP 5 at Prewitt Loop Road. As shown in the location maps below, this site has also experienced multiple crashes with varying degrees of severity. The demonstration of the HFST installation impressed

The Accelerating Safety Activities Program (ASAP) supports the goal of promoting safety innovation through training, outreach, and education focusing on roadway departure, intersection, pedestrian, and bicycle safety. An announcement with the FY 2019 ASAP application and award dates will be issued after our **new ASAP Web page**, at <https://safety.fhwa.dot.gov/asap>, goes live on February 1, 2019.

the District Chief Engineer, who indicated that two additional locations will be evaluated for potential HFST installation.

## NEW GUIDANCE: 100 PERCENT FEDERAL FUNDING SHARE FOR TRUCK PARKING PROJECTS

By: Jeff Purdy, FHWA Office of Freight Management and Operations

Commercial motor vehicle parking shortages are a national safety concern. Section 1401 of the Moving Ahead for Progress in the 21st Century (MAP-21, Pub. L. 112–141 July 6, 2012), commonly referred to as “Jason’s Law”—named in memory of truck driver Jason Rivenburg, who was murdered in 2009 while parked at an abandoned gas station because he could not find safe parking—was established to provide a “national priority on addressing the shortage of long-term parking for commercial motor vehicles on the National Highway System to improve the safety of motorized and non-motorized users and for commercial motor vehicle operators.”

Truck parking is an eligible activity under a number of Federal-aid Programs, including the National Highway Performance Program, the Surface Transportation Block Grant Program, the National Highway Freight Program, and the Highway Safety Improvement Program. Additional guidance has been released for 23 U.S.C. 120(c), which allows a 100 percent Federal share for safety rest areas located on a segment of highway that the FHWA Division Administrator determines to have a shortage of rest areas.

FHWA recommends the States use a data-driven, systemic process to identify highway corridors that have a shortage of safety rest areas and are at risk for crashes related to driver fatigue. Potential project locations may also include areas with large numbers of trucks parking in illegal or unsafe locations that create hazards to other motorists. The analysis should support additional rest areas as an appropriate countermeasure to mitigate commercial motor vehicle-related crashes or fatigue-related crashes. The [Jason's Law Truck Parking Survey and Comparative Analysis](#) along with State Freight Plans, truck parking plans, crash data, and commercial motor vehicle enforcement data are good sources of information for making this determination. To be eligible for HSIP funds,

the project must also be consistent with the State's Strategic Highway Safety Plan.

For more information on this guidance or other resources on safe truck parking, please visit the

FHWA Office of Freight Management and Operations [Truck Parking](#) page, or contact Jeff Purdy at [jeffrey.purdy@dot.gov](mailto:jeffrey.purdy@dot.gov).

## BY THE NUMBERS: SAFETY DATA AND ANALYSIS

### ICE IS NICE: TOOLS TO SUPPORT INTERSECTION CONTROL EVALUATIONS

By: Pete Jenior, Kittelson & Associates, Inc., Kevin Chiang, KLS Engineering and Jeffrey Shaw, FHWA Office of Safety

A growing number of states are adopting Intersection Control Evaluation (ICE) policies so that they can more consistently consider innovative intersection solutions on a project-by-project basis. ICE policies provide a framework with which to objectively evaluate different intersection and interchange ramp-terminal forms, including roundabouts and other innovative designs such as restricted crossing U-turns (RCUTs) and diverging diamond interchanges (DDIs). Nearly a dozen States have implemented ICE policies, including the early-adopter States of California, Washington, Minnesota, Indiana, Wisconsin, Georgia, and Florida. Among the notable benefits of ICE policies is the ability to explicitly consider safety performance in the early scoping stages of a project.

Designers must consider many performance measures before they ultimately choose a preferred intersection form. Safety and traffic operations are two important factors to consider, but they are among the most challenging for practitioners to analyze. Many commercial traffic operations analysis software packages do not explicitly analyze emerging control strategies—especially innovative intersections—and the process of selecting and applying appropriate crash modification factors (CMFs) for some intersection forms can be time consuming.

While existing ICE policies take different approaches and involve varying processes, at their core, these policies involve objective analysis of individual intersection forms under consideration. Through its Transportation Pooled Fund Study Program, the FHWA recently developed two tools to help States implement ICE—an updated [Capacity Analysis for Planning of Junctions \(CAP-X\) Tool](#) and a new [Safety Performance for](#)

[Intersection Control Evaluation \(SPICE\) Tool](#).

Taken together, the CAP-X and SPICE Tools will further streamline efforts to consider innovative intersections routinely.

#### The CAP-X Tool

The updated CAP-X Tool enables planning-level traffic analyses for 23 conventional and innovative intersection forms. The only required user inputs are a peak-hour turning movement count and the basic lane configuration of each intersection/interchange form. CAP-X uses critical lane volume analysis to evaluate signalized intersections (including innovative forms), planning-level techniques from the *Highway Capacity Manual (HCM) Planning and Preliminary Engineering Applications Guide* (NCHRP Report 825) to analyze stop-controlled intersections, and HCM methods to evaluate roundabouts. With these planning-level techniques, users can quickly compare the traffic operations feasibility of different intersection and interchange forms.

The updated CAP-X includes new data entry screens, customizable report screens, analysis capability for several new intersection and interchange forms, and assessments of pedestrian and bicycle comfort and quality of service at each intersection/interchange form. Collectively, these updates make CAP-X easier to use and enable the tool to produce customized reports and outputs that are useful and informative to users.

#### The SPICE Tool

The SPICE Tool uses *Highway Safety Manual* (HSM) methodologies to analyze 17 conventional and innovative intersection forms. The tool incorporates safety performance functions (SPFs), when possible, and uses HSM Part D CMFs for intersection/interchange forms for which no nationally established SPFs are available. The CMFs selected for roundabouts and innovative intersections are based on nationally applicable, high-quality research. HSM analysis is often challenging in the early project planning stages

because some inputs required to compute SPFs and associated adjustment factors (i.e., Part C CMFs) may not be known. As a result, the SPICE Tool uses default values for inputs that have a relatively small effect on crash prediction. The SPICE Tool allows for use of locally developed calibration factors, and advanced users can replace the HSM SPFs with locally developed SPFs.

Both tools are spreadsheets with macro code performing some computations. Because these tools are open-source, users can modify and customize any of the calculations and functionalities. Both tools may be downloaded at no cost from the FHWA website.

### Expanding Innovative Intersection Design

Efforts to mainstream and accelerate the installation of innovative intersections will continue due to the proven safety benefits of these configurations. The growth of roundabouts in recent decades offers a glimpse of the potential for overall innovative intersection growth. The first U.S. roundabout was constructed in 1990;<sup>1</sup> by 1998, approximately 38 had been built,<sup>2</sup> and by 2017 that number had grown to more than 4,400.<sup>3</sup> Many States have now mainstreamed roundabouts to the point that they are routinely considered for new and modified intersections.

The same progress will likely occur with all innovative intersections. Easy-to-use analytical tools that help practitioners consider innovative designs will contribute toward that progress. States that have had ICE policies in place for several years have already seen an increase in the number of innovative intersections constructed, leading directly to our most important goal—fewer people killed or injured at those intersections.

For more information about ICE and the SPICE and CAP-X tools, please contact Jeff Shaw at [jeffrey.shaw@dot.gov](mailto:jeffrey.shaw@dot.gov) or visit the FHWA's [Intersection Control Evaluation page](#).

<sup>1</sup> Pochowski, Alek, Andy Paul, and Lee Rodegerdts. NCHRP Synthesis 488: Roundabout Practices. Transportation Research Board, Washington, DC, 2016.

<sup>2</sup> Rodegerdts, Lee et al. NCHRP Report 672: Roundabouts, An Informational Guide, 2nd Edition. Transportation Research Board, Washington, DC, 2010.

<sup>3</sup> Rodegerdts, Lee. "Status of Roundabouts in North America," poster presented at the Fifth International Roundabout Conference, Green Bay, Wisconsin, May 2017.

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## EDC UPDATE: MAKING DECISIONS MORE DATA-DRIVEN

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*By: Jerry Roche, FHWA Office of Safety*

FHWA's EDC-4 Data-Driven Safety Analysis innovation team has been busy delivering technical assistance this fall, helping transportation agencies across the country make more data-driven decisions within their policies and procedures. Here's just a snapshot of some of the recent activities.

### City of Pittsburgh, PA

Staff in the city's newly formed Department of Mobility and Infrastructure have invested in growing the available multimodal transportation facilities, but wanted to improve their understanding of the safety concerns facing non-motorized users to better prioritize investments. The assistance provided through this effort helped the city develop a framework for conducting safety analysis using a combination of crash history and risk-based characteristics at:

- High-Pedestrian Crash Locations – Locations with a recent history of pedestrian crashes.
- High-Risk Pedestrian Corridors – Locations with high-risk factors for pedestrian safety in areas of high equity concerns.
- High-Need Pedestrian Corridors – Locations with high motor vehicle traffic volumes with few or infrequent pedestrian improvements.
- Key Walking Streets – Business districts located within walking distance of frequent transit service.

These safety analyses will also support the development of a city-wide Pedestrian Safety Action Plan (PSAP), the first phases of which kicked off in 2018.

### Kentucky Transportation Cabinet

Traditionally, the Kentucky Transportation Cabinet (KYTC) employed a critical crash rate method for network screening as a part of its project identification and prioritization process. KYTC had a desire to better estimate the potential safety performance of generalized projects prior to the

development of design-level details. The DDSA team provided technical assistance and helped develop a method for KYTC to rank sites across facilities using a combination of critical crash rates and safety performance functions. The team also helped develop “planning-level” crash modification factors (CMFs) to estimate the potential safety effects of projects in the planning process. These planning-level CMFs were developed based on previous work performed by the Virginia and North Carolina DOTs.

## Tennessee Department of Transportation

Historically, Tennessee Department of Transportation (TDOT) has used a safety management process that relied on traditional analytical methods, including the use of observed crash frequencies and rates to identify locations that have higher-than-normal crash experience. The methods are akin to those described in the Highway Safety Manual as being prone to regression to the mean. A recent FHWA research effort<sup>1</sup> provided evidence that more-rigorous DDSA methods were in fact more reliable in identifying locations that could benefit most from additional safety investments. TDOT expressed a desire to further incorporate DDSA throughout their project development process and requested assistance in developing an implementation plan to achieve this. The DDSA team worked with TDOT to conduct a workshop that included sessions with each relevant business unit (planning, strategic investments, design, operations, maintenance, environment, and safety). The workshop had four primary objectives:

1. Develop improved analyses in a formal safety management process.
2. Support, expand, and formalize TDOT’s data governance over safety data.
3. Develop data-driven safety analyses supporting design activities.
4. Incorporate data-driven safety analyses into other TDOT business processes.

Tasks to accomplish these objectives will be developed in late 2018 and documented in the forthcoming implementation plan.

If your agency is interested in DDSA technical assistance, or if you have questions about how to use data-driven safety analysis to improve your agency processes, please contact Jerry Roche at

[jerry.roche@dot.gov](mailto:jerry.roche@dot.gov) or John McFadden at [john.mcfadden@dot.gov](mailto:john.mcfadden@dot.gov). We also encourage you to visit the [DDSA web page](#) to access an array of resources that will help you improve your agency’s approach to predictive and systemic analysis.

<sup>1</sup> FHWA. Reliability of Safety Management Methods: Network Screening. FHWA-SA-16-037. Washington, DC, 2016. Available at: <https://safety.fhwa.dot.gov/rsdp/downloads/fhwasa16037.pdf>

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## FHWA ENHANCES THE SHRP2 RID TO IMPROVE DATA UTILITY AMONG SAFETY RESEARCHERS

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*By: Yusuf Mohamedshah, FHWA Office of Safety Research and Development*

Congress authorized the second Strategic Highway Research Program (SHRP2) under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Section 5210 (Public Law 109-59) to address highly pressing needs related to the Nation’s highway system, including the reduction of highway deaths and injuries. The SHRP2 program is the central element of the roadway safety community’s response to Congress’ instruction. SHRP2 focused on the collection of two truly unique, rich, and massive data sets to provide safety researchers the opportunity to delve into the relationships between human behavior and safety on the road:

- **SHRP2 Naturalistic Driving Study (NDS).** The NDS comprises data from the vehicles of more than 3,500 volunteers. These vehicles were heavily instrumented with a number of sensors as well as both still and motion cameras. (More than 1 million hours of video is included in the NDS data set.) For up to 2 years, all of that data was recorded whenever the vehicle was running. The NDS consists of an extensive collection of detailed information capturing in-depth insights into the driver, vehicle, trip, and the roadway. Overall, the NDS data represents an unprecedented environment for advanced life-saving research.
- **Roadway Information Database (RID).** Although the NDS is understandably exciting for most researchers, there is another aspect of the overall SHRP2 data program that provides

crucial information for researchers, although it might not seem as “glamorous” or as extensive as the NDS. It is the Roadway Information Data, or RID, which is a compilation of the roadway data for each of the NDS trips taken by the more than 3,500 NDS volunteers. The RID is useful on its own for many research questions; however, it also offers the opportunity for researchers to cross-link information about the road environment with the behavioral data garnered by the NDS, magnifying the research value of each data set.

## Enhancing the RID

The RID consists of two general types of data:

1. New roadway data collected consistently across six study sites (see Figure 1) by mobile data collection vehicles. After it was collected, this data was then validated and quality checked to ensure it met project specifications.
2. Existing data acquired from State DOTs and other public sources (e.g., FHWA, National Oceanic and Atmospheric Administration).

The RID data covers approximately 12,500 centerline miles across the study sites and, in addition to the roadway characteristics and features, includes a high-definition video-log. The acquired public data covers approximately 200,000 centerline miles. In addition to the State roadway inventory files, it includes supplemental data on traffic volumes, weather, work zones, crash histories, and safety laws.

The new roadway data collected for each study site are in Arc/GIS format, so using and processing the data requires expertise in manipulating data using Arc/GIS software. To make the RID more user-friendly, the SHRP2 RID team developed a set of enhancements to make it easier for researchers who are not experts in Arc/GIS to be able to use the data effectively.

## Reduced Datasets

The following reduced datasets will enhance and simplify the use of RID for researchers conducting data analysis and extraction:

- **The Speed Limit Dataset** consists of speed limits merged from mobile data collection, State-

provided data, Highway Performance Monitoring System data, and ESRI Links data. The merged dataset provides a single speed limit for each route based on a data source hierarchy. The hierarchy is established such that the values from mobile data are considered the most accurate, followed by State-provided data, HPMS data, and Links data.

- **The Horizontal Curves Dataset** summarizes roadway attributes along a curve, allowing for a quick way to query the curve segments based on roadway attributes. Typically, this process requires an experienced user to perform multiple dynamic segmentations (description below) to merge data from lanes, signs, grades, and shoulder features data.

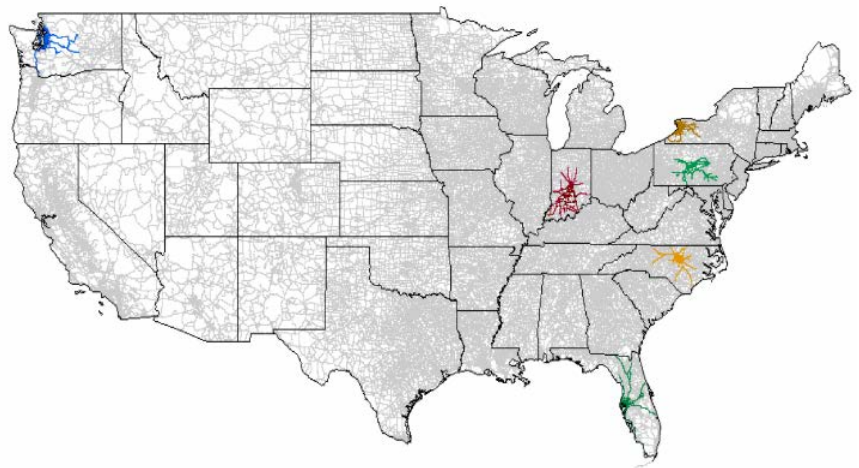


Figure 1. The six States from which data were collected were Florida, Indiana, New York, North Carolina, Pennsylvania, and Washington.

- **The Lanes Dataset** provides the total number of lanes in both directions of travel. The original data in the RID was collected separately for each direction of travel. For an inexperienced user, it would be difficult to associate the number of lanes in both directions of travel. Dynamic segmentation associates the different directions of travel and provides the total number of lanes in both directions while also retaining the roadway attributes for each direction.
- **The Intersections Dataset** creates a single composite intersection based on data present for each leg of the intersection, eliminating duplicate counts of the number of intersections. In addition, distance to the nearest intersection and intersection stop-control type is part of the dataset, providing researchers additional capabilities to query the intersections by distance to nearby intersection feature.

- **The Divided/Undivided Roadway Dataset** provides a simplified representation of median presence/absence along the routes where mobile data was collected. This dataset will make it easier to determine divided and undivided roadway segments.
- **The Annual Average Daily Traffic (AADT) Dataset** provides easy access to traffic data, which is critical for any highway safety research. The AADT in the RID is available in multiple feature layers, but it is not consistent in terms of accuracy and reporting. This dataset will allow users access to the most accurate AADT values in both directions of travel.

The reduced datasets are distributed to all the registered RID users, bundled with the latest version of the RID. These datasets allow users with limited GIS experience to integrate multiple features layers to perform highway safety research.

### The Dynamic Segmentation Tool

Dynamic segmentation (DS) is the process of merging two features layers in GIS based on certain criteria. Successfully executing DS requires many steps in a certain order to achieve the desired output. To make the process of merging various layers easier for novice Arc/GIS users, the SHRP2 RID team developed an application based on a graphical user interface. It allows the user to select the features layers and apply a sub-setting criterion to each layer (up to 10 layers at a time) to

produce a final, research-ready dataset. The Dynamic Segmentation Tool is bundled with the latest version of the RID and is available to all registered users.

### Basic Characterization of Variables

The RID comes with basic documentation listing all the variables collected by the automated data collection van, the orientation of variables (point versus line), and range of values for a given variable.

There are two types of variables for each site: continuous (e.g., AADT, degree of horizontal curves, lane widths, etc.) and discrete (e.g., shoulder types, median types, signs, etc.).

The SHRP2 RID team also developed a series of tables showing mileage and number of segments for select geometric variables for each of the six sites. Table 1 shows counts and mileage by various lane widths. These tables are available upon request from FHWA. The tables will help users determine how much data to expect for a given variable for each study site. With these tables, users will be able to answer basic questions such as:

- What are the total miles for a given lane width?
- What are the total miles by degree of curve?
- What are the different barrier types?
- How many different highway signs are there?

Table 1. Counts and mileage by lane width.

Lane Width	Florida		Indiana		Pennsylvania		North Carolina		New York		Washington	
	Counts	Mileage	Counts	Mileage	Counts	Mileage	Counts	Mileage	Counts	Mileage	Counts	Mileage
1-7	418	33	1,488	338	57	10	475	74	1,379	273	39	2
8	1,336	107	2,540	526	198	44	1,355	241	2,061	436	471	36
9	3,483	265	3,180	635	1,101	330	3,311	539	2,335	486	3,754	335
10	10,653	1,058	4,289	941	4,150	1,135	9,506	1,489	3,299	811	10,837	1,112
11	17,308	1,988	4,333	1,171	4,767	1,216	8,728	1,345	2,771	657	8,712	1,534
12	3,647	432	1,517	334	1,867	326	3,548	413	1,548	315	3,390	490
13	1,442	141	759	58	983	74	1,504	112	1,037	98	1,489	135
14	540	30	701	28	855	52	666	49	877	53	963	52
15+	4,237	144	6,219	193	4,395	170	1,606	63	5,753	214	10,091	344
<b>Total</b>	<b>43,064</b>	<b>4,198</b>	<b>25,026</b>	<b>4,224</b>	<b>18,373</b>	<b>3,358</b>	<b>30,699</b>	<b>4,325</b>	<b>21,060</b>	<b>3,344</b>	<b>29,655</b>	<b>3,696</b>



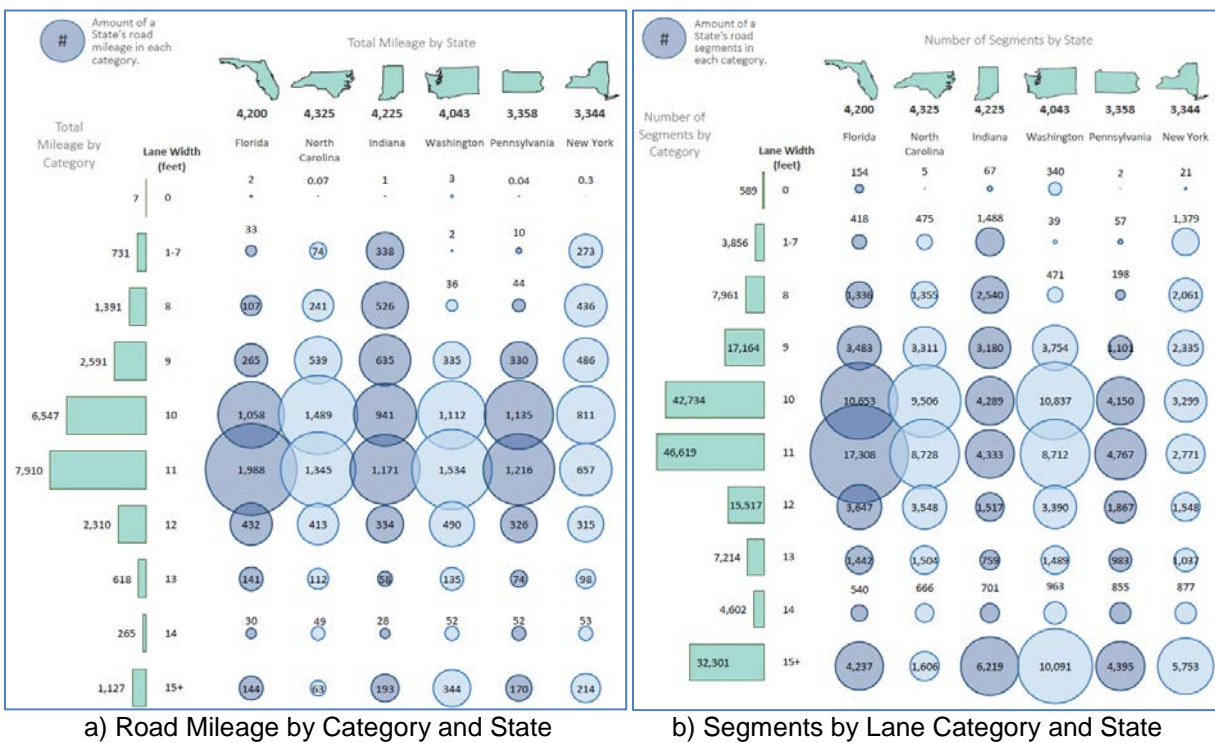
### Visual Representation of Mileage and Segment Counts

Looking at Table 1, users might have difficulty seeing any pattern for a given variable. To make better sense of data and help users visually detect the values in tables, the SHRP2 RID team developed a bubble graph as a companion for each of the variables. The team also developed counts and mileage frequencies for each of the variables. Figures 2a and 2b are the bubble chart representations of Table 1 values. The [bubble charts](#) are available on the RID web page.

### Conclusion

By providing several enhancements to the RID, both in terms of reduced datasets and better visualization of data, users will be able to use the RID more quickly and efficiently. The SHRP2 RID team is also in the process of developing additional reduced datasets and webinars to explain their development and usage, so check the [RID web page](#) often for updates and announcements.

For more information about the NDS or the RID, please contact Yusuf Mohamedshah at [yusuf.mohamedshah@dot.gov](mailto:yusuf.mohamedshah@dot.gov).



Figures a) and b) summarize RID data availability across the six participant States. For each of several roadway characteristics, users can see at a glance how much mileage is in the RID database for road segments different categories. Source: FHWA

## STATE OF THE PRACTICE: UPDATES FROM STATES AND LOCALITIES

### CIRCLING AROUND ON THE FIRST “NATIONAL ROUNDABOUTS WEEK” CAMPAIGN

By: Jeffrey Shaw, FHWA Office of Safety and Hillary Isebrands, FHWA Resource Center

The first-ever “National Roundabouts Week” took place the third week of September 2018. The FHWA Safety Program and Office of Public Affairs

coordinated the timing and themes for National Roundabout Week with representatives from State, local, and Tribal road agencies, as well as national road safety partners and associations, in order to promote the safety benefits of roundabouts to the general public. According to the AASHTO *Highway Safety Manual*, roundabouts can reduce crashes that result in fatalities and injuries by roughly 80 percent. As Mike Griffith, Director, Office of Safety

Technologies stated, “When it comes to making travel through intersections safer, the modern roundabouts being built by State, local and Tribal agencies are true lifesavers.”

For 5 days, FHWA and its partners used social media channels such as Twitter, Facebook, Instagram and LinkedIn to share basic information, educational videos, examples of successful roundabouts, and provide a forum for an exchange of all things roundabouts. FHWA created a [National Roundabout Week web page](#) to guide the content throughout the week, encouraging partners to use the [#nationalroundaboutsweek](#) or [#roundaboutsweek](#) hashtags when posting items to social media channels.

An internet search of these two hashtags revealed more than 500 original posts throughout the 5-day period across social media channels, not including the number of re-tweets, likes, replies, etc. Among the more compelling posts, highlighted at right, were those from local emergency responders expressing in their own words, based on their own experiences, how effective roundabouts are at saving lives in their communities. Additionally, National Roundabouts Week garnered attention from regional and local media outlets, including positive television coverage and newspaper stories across the country.

Two Midwestern cities went all in for National Roundabouts Week, sponsoring local events in addition to posting items to social media. In the City of Carmel, Indiana, which is known as “Roundabout City, USA” with more than 100 roundabouts on its road network, a week-long celebration of roundabouts culminated in a roundabout block-party featuring roundabout trivia and live music. Just 3 hours east, along Interstate 70, the City of Hilliard, Ohio, spent the week highlighting an ongoing educational campaign of its own built around the theme [#RoundaboutRules](#). This campaign is designed to help drivers navigate two-lane roundabouts safely by reinforcing a few simple rules: Yield to Both Lanes, Choose the Correct Lane, and Yield to Pedestrians at Crosswalks. Both cities even produced their own roundabout t-shirts, as shown at right.

FHWA encourages agencies to consider roundabouts during new construction and reconstruction projects as well as for existing



*Firefighters at the Norwich Township Fire Department and Staff from the City of Hilliard in Ohio join citizens in Carmel, Indiana to celebrate National Roundabouts Week. Tweets courtesy of Letty Schamp and the City of Carmel, IN.*

intersections that have been identified as needing safety or operational improvements. To learn how to implement a roundabout in your community,

please contact Jeffrey Shaw at [jeffrey.shaw@dot.gov](mailto:jeffrey.shaw@dot.gov) or Hillary Isebrands at [hillary.isebrands@dot.gov](mailto:hillary.isebrands@dot.gov). Find more information on this and 19 other life-saving safety improvements at the FHWA's [Proven Safety Countermeasures](#) page.

## RHODE ISLAND COMPLETES ITS LARGEST ROUNDABOUT EVER IN HISTORIC APPONAUG VILLAGE

*By: Wilfred Hernandez, FHWA, Rhode Island Division Office*

The \$71 million Apponaug Circulator project, built by the Rhode Island Department of Transportation (RIDOT), has transformed this historic village in the heart of Warwick, Rhode Island's third largest city.

Roundabouts are being installed throughout Rhode Island to improve traffic flow, increase safety, and, in the case of one of its largest roundabout projects, to promote economic development. Gone is a one-way circulation pattern that was in place for decades and funneled 25,000 vehicles a day through the center of the village, adversely impacting business growth and pedestrian traffic.

Today, Apponaug features a newly constructed roadway linked with a series of roundabouts to move traffic efficiently and safely through the area. With the removal of congestion, the stage is set for new economic development opportunities. The

village center is more pedestrian friendly and amenable to the restaurants and shops located there. An 18th century mill site, isolated by the previous configuration, was sold and is being renovated to house the offices of AAA Northeast.

Across the State, there are about 20 roundabouts in operation and many more are in the design pipeline. This summer alone, RIDOT opened three new roundabouts. In Tiverton, RIDOT entered into a public-private partnership with the Tiverton Casino Hotel to fund a long-planned intersection improvement project that now incorporates the entrance to the new gaming facility. In Chepachet Village in the Town of Glocester, RIDOT installed a new roundabout to replace a signalized intersection that operated poorly and experienced extensive traffic delays on a regular basis. Finally, in Coventry, a new roundabout along a rural section of Route 102 calms traffic while significantly reducing the possibility of serious injuries or fatalities from higher-speed crashes.

Learn more about the Apponaug Circulator project by visiting <http://www.ridot.net/news/apponaug/index.php>, or contact Wilfred Hernandez at [wilfred.hernandez@dot.gov](mailto:wilfred.hernandez@dot.gov). For more information, including an interactive presentation on all roundabouts in Rhode Island, visit the [Rhode Island DOT's Roundabouts information page](#).



*The Apponaug Village roundabout will feature a landscaped central island. Source: RIDOT.*



*Aerial view of the new Apponaug Village roundabout during final construction. Source: RIDOT*

## NEW RESOURCE ROUNDUP

### IHSDM UPDATE: RELEASE 14.0.0 NOW AVAILABLE!

By: Abdul Zineddin, FHWA Office of Safety R&D

The Interactive Highway Safety Design Model (IHSDM) 2018 Public Release (version 14.0.0) is now available for free downloading at the [IHSDM Home Page](#). FHWA held a Data-Driven Safety Analysis (DDSA) webinar on **November 1** to introduce the new release. A [recording of the webinar](#) is now available.

#### What is IHSDM?

Developed in support of the Data-Driven Safety Analysis (DDSA) initiative through the FHWA's Every Day Counts 4 (EDC-4) efforts, the IHSDM is a suite of safety analysis tools designed to evaluate the safety and operational effects of project-level geometric design decisions on highways. The IHSDM Crash Prediction Module (CPM) serves as a faithful implementation of [Highway Safety Manual](#) (HSM) Predictive Methods (Part C) for two-lane rural highways, multi-lane rural highways, urban and suburban arterials, freeways and ramps/interchanges. The complete IHSDM suite consists of six modules and is [available for download](#) at no cost.

#### What's new in the IHSDM 2018 Release?

- **CPM Evaluation Reports:** Expanded result tables now include Total, FI, and PDO crash frequencies by highway segment. The 2018 additions to the tool include "Crash Frequencies by Year" (for Total, FI, and PDO crashes) tables. For evaluations using the Empirical-Bayes (EB) process, Expected, Predicted, and Expected–Predicted Crash Frequencies are now available for each highway segment/intersection, as is a summary table comparing predicted and expected crashes for the evaluation period.
- **Site-Based Data:** The new issue also includes a new ability to export/import site set data of a specific site type via Export Site Data and Import Site Data options.
- **IHSDM Economic Analyses Tool (EA Tool):** The new issue features updated default crash costs.

- **IHSDM Tutorial:** The expanded Crash Prediction Module tutorial (Lesson 4) now includes a Pennsylvania I-70 interchange alternatives analysis case study.

#### How do I obtain the 2018 Release?

**Registered IHSDM users:** visit the [IHSDM Home Page](#) and use your IHSDM username and previously assigned password to access and download this new release. If you have an earlier version of IHSDM installed, a "call home" feature will remind you to update to the latest version the next time you use the software.

**New IHSDM users:** visit the "[Download Registration](#)" page and follow the instructions.

#### Whom do I contact for IHSDM technical support?

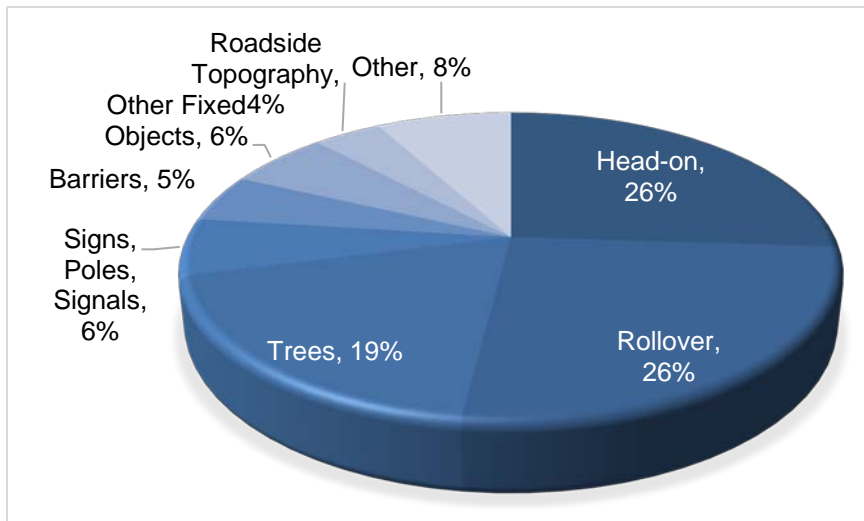
Contact the IHSDM Technical Support team at [IHSDM.Support@dot.gov](mailto:IHSDM.Support@dot.gov) or (202)-493-3407. An updated [IHSDM Resource List](#) provides a summary of all IHSDM-related resources. The [IHSDM Home Page](#) includes information related to the new [IHSDM User Group](#), case studies/user applications, past webinar materials, and frequently asked questions.

### NEW! FHWA REPORT EXPLORES THE USE OF CAV TO REDUCE RWD CRASHES

By: Abdul Zineddin, FHWA Office of Safety

The FHWA Office of Safety R&D recently released a new report, [Infrastructure Initiatives to Apply Connected- and Automated-Vehicle Technology to Roadway Departures](#) that addresses the effects and opportunities resulting from widespread adaptation of connected and automated vehicle (CAV) technologies on our roads. The primary purpose of this study is to explore the role of highway infrastructure in enabling these technologies to reduce the number and severity of roadway departure (RwD) crashes.

The project produced a list of initiatives that FHWA may deploy to support the deployments of CAV technologies in ways that will address RwD



Proportion of roadway departure fatalities by most harmful event.  
Source: FHWA

crashes. The initiatives were developed based on both a review of the current literature as well as through consultation with technology developers, vehicle manufacturers, State and local departments of transportation, infrastructure officials, and other stakeholders. The audience for this report includes traffic engineers, highway designers and planners, and other transportation professionals interested in infrastructure development and reducing roadway departure crashes. The findings will acquaint these readers with potential infrastructure changes that could be deployed to maximize the utility and safety benefits of these emerging vehicle technologies.

For more information about this initiative, please contact Abdul Zineddin, [abdul.zineddin@dot.gov](mailto:abdul.zineddin@dot.gov).

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## JURISDICTION-WIDE SPEED MANAGEMENT PLANS SAVE LIVES

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### Overcoming the Speeding-Related Crash Challenge Proactively and Systemically

By: Guan Xu, FHWA Office of Safety

Speeding—exceeding the posted speed limit or driving too fast for conditions—is a contributing factor in about 30 percent of all fatal crashes. However, while speeding is a national safety issue, effective solutions depend on local and State agencies. As of December 2017, 42 states included speeding, either within the context of aggressive driving and enforcement or as one or more engineering strategies/actions for managing speed

in their Strategic Highway Safety Plans. Since effective solutions must be applied locally, the FHWA Speed Management (SM) Program has been providing technical informational guides, tools, and free training and webinars to assist State and local safety practitioners in implementing SM countermeasures to reduce speeding-related crashes.

A jurisdiction-wide State or local speed management action plan characterizes speeding-related safety problems and speed management issues; identifies appropriate engineering, enforcement, and educational countermeasures and strategies; and outlines actions the State, locality, and other partners can take to implement these strategies to reduce speeding and speeding-related

fatal and injury crashes. An SM action plan can also help facilitate coordination and cooperation among various agency stakeholders, including road planners, designers and managers, enforcement officials, public health practitioners, and policy makers to implement a sustainable speed management program and to target locations where the most cost-effective and feasible countermeasures will have the greatest safety benefits.

During the past several years, FHWA has been providing direct technical assistance to six jurisdictions (five States and one county) to develop and implement their jurisdiction-wide SM action plans. Based on the experience and feedback from State and local practitioners developing these SM action plans, the FHWA Office of Safety has recently developed two flyers related to speed management:

1. Speed Management Action Plan Implementation Steps – Put Your Speed Management Plan into Action.
2. Speed Management – A Systemic Safety Approach – Improving Speed Management Using a Systemic Safety Approach.

These two flyers, available on the [Speed Management Program Reference Materials page](#), outline steps for how the plans could be implemented and summarize how Systemic Safety Approach can be used to identify speeding safety problems and locations.

The FHWA Office of Safety is currently in the process of sponsoring development of three

additional jurisdiction-wide SM plans, and we will continue our efforts to assist State and local agencies that are working to reduce speeding-related crashes and fatalities in developing and implementing their own SM action plans.

For more information, or to request assistance in developing an SM action plan for your state or local jurisdiction, please contact Guan Xu at [guan.xu@dot.gov](mailto:guan.xu@dot.gov).

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## NEW NOTEWORTHY PRACTICES ADDRESS RAIL-HIGHWAY CROSSING SAFETY AND HRRR

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By: Kelly Morton, FHWA Office of Safety

FHWA has been hard at work collecting noteworthy practices to help State practitioners explore effective solutions for improving rural road safety as well as safety at rail-highway at-grade crossings. This fall, four new noteworthy practices were entered into the [Roadway Safety Noteworthy Practices database](#):

- [Funding High Risk Rural Road Projects: Overcoming Limited Data in Kansas](#) – Find out how Kansas overcame its limited data challenge by using the systemic approach to identify and treat rural roads through its High-Risk Rural Road program. KDOT offers advice to other agencies interested in starting their own systemic program in this noteworthy practices flyer.
- [Diagnostic Reviews for Rail-Highway Crossings: Effective Partnering in California](#) – Don't overlook the power of observation! The best way to address a rail crossing safety concern may be taking the time to really look at the location to identify and then treat safety issues. Learn more about how the Rail Crossing Field Diagnostic Teams in California harness the power of observation by conducting structured field reviews of crossings with safety concerns.
- [Using Traveler Information to Mitigate Blocked Rail-Highway Crossings: Local Approaches to Signing Lead to Success](#) – Sometimes safety



*In California, diagnostic field reviews help identify safety issues, confusing warning signs, and other safety risk factors that can be addressed using low-cost treatments. Source: California Public Utilities Commission.*

can be improved using a creative and low-cost solution. Both Kirkwood, MO, and Jackson, MS, are using low-tech, affordable warning signs that divert traffic away from blocked rail crossings to reduce queues and keep travelers moving.

- [Empowering the Community to Achieve Consensus: Rail Corridor Crossing Consolidation and Safety Improvement Project in Missouri](#) – Not all small communities want their rail-highway crossings closed, especially in rural areas where the number of access roads may be limited. Listening to residents and getting their input on which safety solutions to implement can both give the community a sense of empowerment and improve safety. It can also enhance the public's trust in the DOT.

For more information on any of these practices, or to learn more about how you can improve safety on high-risk rural roads or at-grade rail-highway crossings, please visit the FHWA's [High Risk Rural Roads](#) web page, the [Rail-Highway Crossings \(Section 130\) Program](#) page, or contact Kelly Morton at [kelly.morton@dot.gov](mailto:kelly.morton@dot.gov).

## ANNOUNCEMENTS AND EVENTS

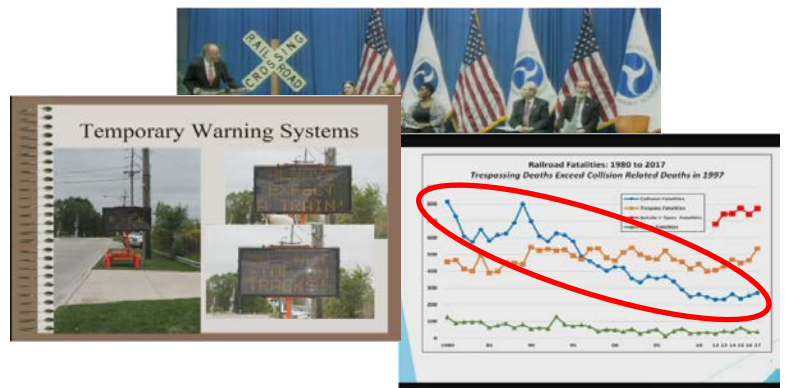
### NATIONAL WALK TO SCHOOL DAY 2018



U.S. DOT staff around the country celebrated National Walk to School day on October 10, 2018, by “hoofing it” with their kids.

## FHWA PARTICIPATES IN FRA SUMMIT ON RAIL HIGHWAY GRADE CROSSING AND TRESPASSING FATALITY PREVENTION

On October 30, 2018, FHWA Office of Safety Program Manager Kelly Morton participated in the FRA Summit on Rail Highway Grade Crossing and Trespassing Fatality Prevention at the U.S. DOT Headquarters in Washington, DC. Kelly shared with the audience FHWA’s efforts to reduce rail-highway grade crossing fatalities and communicated the importance of working with stakeholders to continue to save lives.



## THE 19<sup>TH</sup> ANNUAL NATIONAL WORK ZONE AWARENESS WEEK KICKS OFF ON APRIL 8, 2019!

This year, the National Work Zone Awareness Week will be held April 8-12, 2019, with the national kick-off press event to be held on April 9, 2019, in Washington, DC. National Work Zone Awareness (NWZAW) has been successful in promoting the importance of work zone safety because of participation from a wide array of dedicated individuals and organizations. Just last year, hundreds of companies and individuals reached out via Twitter and Facebook to demonstrate the many ways they were participating in NWZAW. We encourage individuals and organizations to get involved in NWZAW and participate in the annual Go Orange Day to show support for roadway safety, and especially for the families of victims who have lost their lives in work zones. For more information about upcoming NWZAW events, please visit the [National Work Zone Awareness Week](#) home page or contact Martha Kapitanov at [martha.kapitanov@dot.gov](mailto:martha.kapitanov@dot.gov).



*FHWA Puerto Rico division staff pitch in to remind drivers to slow down to save lives in work zones. Source: FHWA*

### Visit the FHWA Office of Safety at Booth 721 in the TRB exhibit hall!

If you are attending the **98<sup>th</sup> Annual Transportation Research Board** meeting this month, be sure to stop by booth 721 in the exhibit hall to check out all the Office of Safety has to offer.

We will be featuring interactive demos of many of the proven safety countermeasures as well as **free materials** from all of our program areas, including (but not limited to):

- The Highway Safety Improvement Program (HSIP)
- Intersection Safety
- Local and Rural Road Safety
- Pedestrian and Bicycle Safety
- Roadway Departure Safety
- The Roadway Safety Data Program
- Speed Management
- Zero Deaths
- Transportation Safety Planning
- Proven Safety Countermeasures
- Road Diets
- STEP
- DDSA

#### Exhibit Hours will be as follows:

Sunday, January 13: 4:00 PM - 7:00 PM  
 Monday, January 14: 9:00 AM - 4:00 PM  
 Tuesday, January 15: 9:00 AM - 4:00 PM.

For more information, please contact Tara McLoughlin at 202-366-2176 or [tara.mcloughlin@dot.gov](mailto:tara.mcloughlin@dot.gov)



**2018 Lifesavers Conference, March 31-April 2, 2019, Louisville, KY**

(<https://lifesaversconference.org/>). The Lifesavers Conference brings together a unique combination of public health and safety professionals, researchers, advocates, practitioners and students committed to sharing best practices, research, and policy initiatives that are proven to work. From distracted motorists and pedestrians to new technologies, drugged driving, autonomous vehicles, and more, Lifesavers addresses the issues impacting roadway safety today.

**NACE, April 14-18, 2019 Annual Meeting/ Management & Technical Conference, Wichita, KS**  
(<https://www.naceevents.org/about-nace-2019>).

This annual conference will allow attendees to compare competing technologies and services, yet spend quality time with the solution providers and peers. The conference includes a series of sessions on topics related to construction and construction management, pavement surfacing and preservation,

emergency management, local road safety plans, innovative technologies, and much more.

**2019 American Society of Highway Engineers (ASHE) National Conference, Nashville, TN**

(<http://2019conference.ashe.pro/>). The conference is expected to attract over 600 public and private sector design professionals, vendors, contractors and guests from across the country, and provide a forum for networking and education on topics relevant to the transportation industry. The agenda is filled with informative technical sessions, social events and networking opportunities.

**ITS America Annual Meeting, June 4-7, 2019, Washington, DC** (<https://www.itsamerica2019.org/>).

With the 2019 theme of "Intelligent Mobility: Safer. Greener. Smarter," ITS America's 2019 Annual Meeting will highlight seamless mobility around the movement of people, data and freight. Innovative business models can flourish in the new age of mobility. Attendees will be a part of the conversation that will shape an environment for safe deployment of connected and automated mobility.

**The *Safety Compass Newsletter***

is a publication of the U.S. Department of Transportation, Federal Highway Administration.

The Federal Highway Administration publishes the Safety Compass newsletter three times a year. We can be reached at:

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Room E71-320  
Washington, DC 20590

The Safety Compass is available online at the FHWA Office of Safety website at: <http://safety.fhwa.dot.gov/newsletter/safetycompass/>.

We welcome your comments and highway safety-related articles. The purpose of this newsletter is to increase highway safety awareness and information and to provide resources to help save lives.

We encourage readers to submit highway safety articles that might be of value to the highway safety community. Send your comments, questions and articles for review electronically to Tara McLoughlin at: [tara.mcloughlin@dot.gov](mailto:tara.mcloughlin@dot.gov).