PREPARING FOR WINTER

Protecting Your Workforce From Injuries and Illnesses When Temperatures Plummet
DRIVING ON DETERIORATED URBAN ROADS COSTING MOTORISTS $1,049 ANNUALLY

Based on 2016 data, TRIP said 33 percent of the nation’s major urban roads had pavements that were in "substandard condition," resulting in a nationwide total annual extra cost to motorists of $130 billion.

LOCAL ROAD SAFETY PLANS MADE SIMPLE

To address local agency concerns about how much time, effort, and cost may be involved in developing an LRSP, the FHWA Data Driven Safety Analysis (DDSA) Team developed an LRSP video to give a brief overview of why LRSPs can be important and to explain how easy the four-step process is.

FHWA OFFERS NEW WEB-BASED TRAINING FOR ROADWAY LIGHTING

FHWA is now offering no-cost, web-based training to help practitioners get a refresher on the basics of nighttime lighting concepts.

PREPARING FOR WINTER: PROTECTING YOUR WORKFORCE FROM INJURIES AND ILLNESSES WHEN TEMPERATURES PLUMMET

Winter is coming! Winter is coming! Yes, that includes for us here in Texas too.

PREPARING FOR WINTER: SAFETY GUIDE FOR WINTER TRAVEL

During the winter months, maintenance teams work hard to make sure roadways are prepared to handle hazardous weather conditions.

TXDOT RECEIVES $7 MILLION IN FEDERAL GRANTS TO BUY NEW BUSES FOR TEXANS LIVING IN RURAL AREAS

The program helps rural transit agencies purchase buses and related equipment and to construct bus-related facilities.

NCHRP GUIDE HELPS PLANNERS MITIGATE WORK ZONE CRASHES

The advent of intelligent transportation systems offers solutions to some of the issues uncovered by analyzing the crash narratives.

TWO SAFETY INNOVATIONS TAKE THE STAGE IN EDC-5: REDUCING RURAL ROADWAY DEPARTURES AND SAFER TRANSPORTATION FOR EVERY PEDESTRIAN

According to national traffic data from the U.S. Department of Transportation, severe and fatal crashes are on the rise across the country, increasing 5.6 percent from 2015 to 2016.

FHWA MAKES $225 MILLION AVAILABLE FOR HIGHWAY BRIDGE IMPROVEMENT GRANTS

The funds must be used for highway bridge replacement or rehabilitation projects on public roads that leverage the efficiencies associated with "bundling" at least two highway bridge projects into a single contract.

FHWA PLANS NEW EDITION OF NATIONAL TRAFFIC CONTROL MANUAL TO ADDRESS INNOVATION, GET READY FOR AUTOMATED VEHICLES – UPDATED MANUAL TO FOCUS ON NEW HIGHWAY TECHNOLOGIES

The publication of a new edition will propose to streamline processes and reduce burdens on state and local agencies by adopting many of the successful devices that have resulted from some of the 150 official experiments that FHWA has approved.

THE UNPREDICTABILITY OF STORMS’ AND OTHER LESSONS LEARNED FROM HURRICANE HARVEY

The unpredictability of storms such as Harvey was one of the key lessons Emmett and his team learned.

TXLTAP EVENT & WORKSHOP SCHEDULE

Register for free TxLTAP workshops and events occurring in 2018 and 2019.
Driving on Deteriorated Urban Roads Costing Motorists $1,049 Annually

A new study issued by TRIP Inc. claims that driving on deteriorated urban roads costs U.S. motorists an average of $1,049 annually in additional vehicle repair needs, extra maintenance, higher fuel consumption and tire wear, plus accelerated vehicle deterioration and depreciation.

"Drivers are paying a hefty price for our nation's crumbling roads and bridges," noted Kathleen Bower, AAA senior vice president of public affairs and international relations, in a statement. "Those traveling daily through urban cities bear the weight of the problem – with many wasting thousands of dollars each year on rising transportation costs due to pot holes and wasted fuel."

TRIP said its 24-page report – entitled Bumpy Roads Ahead: America's Roughest Rides and Strategies to make our Roads Smoother and released on Oct. 17 – examined urban pavement conditions, transportation funding, travel trends and economic development across the nation's large (500,000-plus population) and mid-sized (200,000 to 500,000 population) urban areas.

The group then calculated the additional costs passed on to motorists as a result of driving on rough roads, as well as charting the top 20 large- and mid-sized urban areas with the highest share of pavements in poor condition on major locally and state-maintained roads and highways, as well as the areas with the highest vehicle operating costs or VOCs incurred due to those pavement conditions.

"Motorists are facing a rough ride in many urban areas because of a lack of adequate funding for road repairs"

Based on 2016 data, TRIP said 33 percent of the nation's major urban roads – which includes interstates, freeways and other arterial routes – had pavements that were in "substandard condition," resulting in a nationwide total annual extra cost to motorists of $130 billion.

TRIP added that road conditions could deteriorate further as vehicle travel growth rates are returning to pre-recession levels and large truck travel anticipated to grow significantly, increasing the "wear and tear" on the country's urban roads and highways.

The group noted that vehicle miles travelled or VMT increased by 16 percent from 2000 to 2016 and increased by 6 percent from 2013 to 2016. Travel by large commercial trucks increased by 29 percent from 2000 to 2016, TRIP added, and is anticipated to increase by approximately 56 percent from 2018 to 2045, putting even greater stress on the nation's roadways.

"The needs of our nation's infrastructure continue to grow. This report provides clear evidence that deteriorating roads are a strain on motorists and bad for the economy," noted Ed Mortimer, vice president of transportation and infrastructure at the U.S. Chamber of Commerce, in a statement. "It is past time for federal lawmakers to come together to enact a long-term infrastructure modernization plan."

TRIP added that USDOT's semi-annual report on the condition, use, and funding needs of the nation's surface transportation program pegged the current backlog in needed road and highway rehabilitation at $419.5 billion and that the nation's current $41 billion annual investment in maintaining the condition of roads and highways should be increased by 33 percent to $61 billion annually to cover the cost of needed improvements.

"Motorists are facing a rough ride in many urban areas because of a lack of adequate funding for road repairs," Will Wilkins, TRIP's executive director, explained in a statement. "Some states and regional governments have begun to address their needs through recent funding increases, but it will also take action by the federal government. Congress can help by fixing the federal Highway Trust Fund with a sustainable source of user-fee based revenue."
People hear the words "Local Road Safety Plan" (LRSP) and they start to think that it needs to include rigorous analysis, have lots of pages, take a lot of time, or that they need a consultant to write it. But the truth is, LRSPs are scalable and, often, starting with a plan as short as 10 or 15 pages that can be enhanced over time is the best way to gain experience and perspective.

To address local agency concerns about how much time, effort, and cost may be involved in developing an LRSP, the FHWA Data Driven Safety Analysis (DDSA) Team developed a LRSP video to give a brief overview of why LRSPs can be important and to explain how easy the four-step process is.

The simple video, which runs just under 2.5 minutes, explains that all an agency needs to get started is a small group of stakeholders—from law enforcement, EMS, public health and elected officials, for example. And an agency doesn't need comprehensive data to create an effective plan, either. Data sources can include crash data, maintenance logs, details of safety audits, and even traffic violations. Then, the stakeholder team selects proven, low-cost countermeasures to address these locations—for example, placing chevrons at a subset of an agency’s curves or a installing a leading pedestrian interval at certain signalized intersections. Finally, the solutions are implemented to reduce crashes and fatalities on local roads. One way this has been accomplished is by bundling the application of multiple countermeasures into one project, even including locations within multiple agencies. And, local agencies don’t need to wait to develop improvement projects; many strategies can be undertaken by maintenance and enforcement partners in short order.

FHWA developed the video in partnership with the National Association of County Engineers (NACE) and the National Local Technical Assistance Program Association. Both groups provided feedback on the video and are using it to promote safety within their own programs and initiatives. In fact, as part of the Every Day Counts Round 4 initiative, the DDSA team partnered with NACE on a pilot project to help 25 counties in California, Colorado, Florida, Nevada, Ohio, and Wisconsin develop LRSPs. The video was developed with the first group of NACE pilot counties in mind, and was debuted with them to determine whether it was effective. At present, the DDSA team is identifying States and corresponding counties for a second round of the pilot as well.

For more information on the Local Road Safety Plan initiative, or to find out more about how to develop an LRSP for your community, contact Jerry Roche at jerry.roche@dot.gov.
The advent of light-emitting diode (LED) has initiated a major transition in the way agencies are approaching and using roadway lighting. LEDs offer the potential for savings in energy and maintenance costs, improved visibility, and easier control of lighting intensity. However, along with these potential advantages, questions have also arisen about the possibility of increased glare, light pollution, and impacts on human circadian rhythms.

In recent years, many transportation agencies have begun to experience a lack of “in-house” expertise about lighting design due to retirements or personnel reassignments. To address this knowledge gap, and to help answer agency questions about how and when to use new lighting technologies such as LEDs, FHWA developed a new training course entitled “Web-based FHWA Roadway Lighting Workshop,” which is now available as a web-based, on-demand training program. The course is based on a combination of guidance from the Roadway Lighting Handbook as well as a series of workshops held around the country and other, more recent technical advancements on roadway lighting design.

FHWA is now offering no-cost, web-based training to help practitioners get a refresher on the basics of nighttime lighting concepts and to learn about the latest technologies for safely and effectively lighting roadways at night. Other topics include basic terminology, practices for determining whether and how lighting should be installed and controlled, measurement issues, and more.

The course is divided into four modules to enable practitioners to view each module in convenient one-hour periods:
• Module 1: Overview of Roadway Lighting Design
• Module 2 Lighting Hardware Design and Light Source Considerations for Roadway Lighting
• Module 3: Street and Roadway Lighting Design
• Module 4: Special Topics (including Lighting Equipment Location, Special Locations, Ambient Environments, and Spectral Effects)

Individuals who complete this course will gain a greater understanding of the basics of roadway lighting, its potential benefits, and how decisions are made regarding its installation. They will also learn about the technology and hardware used in roadway lighting and adaptive control systems and be able to take into consideration the criteria and calculations that underlie roadway lighting design and measurement. They will be equipped to address special situations, like the level and type of lighting needed for crosswalks and roundabouts and how to address visual perception issues and light pollution. They will also gain insight into the possible impacts of lighting on human circadian rhythms.

The primary intended audience for this training includes traffic safety engineers from transportation agencies whose responsibilities include making design decisions about roadways and roadway safety systems, those who work with the public and communicate about agency decisions regarding roadway lighting, and lighting contractors for the design and specification of roadway lighting systems. The initial module may also be of interest to the general public wishing to learn more about roadway lighting.

This web-based training is openly available free of charge. FHWA urges you to take the “Web-based FHWA Roadway Lighting Workshop” to improve your understanding of the many important elements that should be taken into account when designing, installing, and maintaining roadway lighting. For more information about this course or FHWA’s Nighttime Visibility initiative, please contact Joseph Cheung at joseph.cheung@dot.gov.
Winter is coming! Winter is coming! Yes, that includes for us here in Texas too. Although our winters are typically mild in comparison to other parts of the country, preparations must still be taken to protect outdoor workers when temperatures drop to near and below freezing.

Three important factors that outdoor workers should keep in mind are air temperature, wind, and moisture. In short low temperature + wind speed + wetness = injuries and illnesses. Using the sliding scale developed by the American Conference of Governmental Industrial Hygienist, that is based on air temperature, wind, and moisture, OSHA created the cold stress equation informative graphic below.

The graphic shows that exposed skin is in danger of freezing within one minute when the temperature is between -20° and -30° F and no wind is present. With winds around 20 mph, that danger zone threshold begins at 10° F because blowing air can take away at least part of the bubble of heat that the body creates. Trench foot and chilblains can occur at temperatures as high as 60° F, according to NIOSH.

**Wind Chill Temperature: A Guide for Employers**

Outdoor workers exposed to cold and windy conditions are at risk of cold stress, both air temperature and wind speed affect how cold they feel. Wind Chill is the term used to describe the rate of heat loss from the human body, resulting from the combined effect of low air temperature, and wind speed. The Wind Chill Temperature is a single value that takes both air temperature, and wind speed into account. For example, when the air temperature is 40° F, and the wind speed is 35 mph, the wind chill temperature is 28° F; this measurement is the actual effect of the environmental cold on the exposed skin. The National Weather Service (NWS) Wind Chill Calculator allows users to input the air temperature and wind speed, and it will calculate the wind chill temperature.

The American Conference of Governmental Industrial Hygienists (ACGIH) developed a Work/Warm-up Schedule for a 4-hour shift that takes both air temperature and wind speed into account, to provide recommendations on scheduling work breaks and ceasing non-emergency work.

**What Should Employers Do?**

OSHA does not have a definitive standard on working in the cold but states that employers must protect workers from hazards in accordance with the Occupational Safety and Health Act.

OSHA and NIOSH recommends:
- Employers should train workers.
  Training should include:
  - How to recognize the environmental and workplace conditions that can lead to cold stress.
  - The symptoms of cold stress, how to prevent cold stress, and what to do to help those who are affected.
  - How to select proper clothing for cold, wet, and windy conditions.
- Employers should:
  - Monitor workers physical condition.
  - Schedule frequent short breaks in warm dry areas, to allow the body to warm up.
  - Schedule work during the warmest part of the day.
  - Use the buddy system (work in pairs).
  - Provide warm, sweet beverages. Avoid drinks with alcohol.
  - Provide engineering controls such as radiant heaters.

Additionally, NIOSH advises workers to avoid touching metal surfaces with their skin, and to bring extra clothing. Other items workers should have with them include blankets, a thermos with a hot beverage, and a first aid kit with chemical hot packs and a thermometer. OSHA warns workers to avoid working fatigued or exhausted “because energy is needed to keep muscles warm.”

**What Happens to the Body and What Should Be Done?**

OSHA and NIOSH recommend that employers train workers on the prevention, risks and symptoms of cold stress well in advance of winter weather.

**Frostbite:** occurs when skin and tissue freezes, and can lead to permanent damage, potentially leading to amputation in severe cases. Symptoms include numbness, tingling, aching, blistering, and skin that feels firm or hard. The skin also might look waxy and white, bluish or grayish-yellow.

Experts recommend that someone suffering from frostbite be taken to a warm place as soon as possible, and co-
PROTECTING YOUR WORKFORCE FROM INJURIES AND ILLNESSES WHEN TEMPERATURES PLUMMET

workers on the scene should alert medical personnel. Unless necessary, a person with frostbitten toes or feet should not walk. If outside, workers can protect frostbitten hands by putting them in their armpits, or they can cover their face, nose or ears with a dry, gloved hand.

Other first aid tips:
- Remove any clothing or accessories that might hinder circulation. However, wait until you’re indoors to remove wet clothing.
- Use a loose, dry cloth to protect the frostbitten area until medical help arrives.
- Don’t rub the affected area – rubbing could damage the skin or break blisters.
- Don’t warm the frostbitten area with a heating lamp or hot bath.
- Don’t rewarm the affected area in a dry, warm covering.
- May Clinic warns against trying to warm a worker’s arms and legs if he or she is suffering from hypothermia, as it can add stress to the heart and lungs. The clinic also advises against rewarming a hypothermia victim too quickly “such as with a heating lamp or hot bath.”

Mayo Clinic warns against trying to warm a worker’s arms and legs if he or she is suffering from hypothermia, as it can add stress to the heart and lungs. The clinic also advises against rewarming a hypothermia victim too quickly “such as with a heating lamp or hot bath.”

For mild frostbite, rewarm the affected area with warm water (99° to 108° F) for 15 to 30 minutes, according to Mayo Clinic.

Hypothermia: Severe shivering is one of the first signs of hypothermia, which occurs when the body temperature drops to less than 95° F. Other symptoms include confusion/memory loss, slurred speech, coordination difficulties, slow breathing, irregular heartbeat and loss of consciousness. Emergency personnel should be called as quickly as possible, and wet clothing should be removed and replaced in a warm, dry shelter. Experts also recommend:
- Gradually warm the affected worker, starting with the core of the body (chest, neck and groin).
- If the worker is conscious, give warm, sweet and nonalcoholic liquids.
- Be prepared to administer CPR if the worker becomes unresponsive.
- Once body heat returns, keep the worker – including the head and neck – wrapped in a dry, warm covering.

Trench foot: Warning signs of trench foot, also known as immersion foot, include red skin, tingling, numbness, cramps and blisters. NIOSH advises removing shoes and wet socks, drying the feet, and avoiding walking, which can further damage tissue.

Chilblains: caused when exposure to the cold damages the capillaries in the skin. Symptoms may include redness, inflammation, itching and potential blisters. Sufferers should avoid scratching the skin, which should be slowly warmed. Corticosteroid cream can relieve swelling and itching, and any blisters or ulcers should be cleaned and covered.

Angina: Cardiac issues can arise in the winter more frequently than in summer because there’s a seasonality to heart disease, said Dr. John Osborne, from Grapevine, TX-based State of the Heart Cardiology. Breathing in cold air can cause angina, or chest pains, from the heart not getting enough oxygenated blood. Problems also can arise from lower temperatures constricting the blood vessels and the heart’s extra pumping from a worker’s exertion; so watch for shortness of breath, nausea, and dizziness or lightheadedness.

### Work/Warm-up Schedule for a 4-Hour Shift

<table>
<thead>
<tr>
<th>Air Temperature–Sunny Sky</th>
<th>°F (approximate)</th>
<th>°C (approximate)</th>
<th>Maximum Work Period</th>
<th>Number of Breaks</th>
<th>Maximum Work Period</th>
<th>Number of Breaks</th>
<th>Maximum Work Period</th>
<th>Number of Breaks</th>
<th>Maximum Work Period</th>
<th>Number of Breaks</th>
<th>Maximum Work Period</th>
<th>Number of Breaks</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 mph Wind</td>
<td>10 mph Wind</td>
<td>15 mph Wind</td>
<td>20 mph Wind</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Noticeable Wind</td>
<td>5 mph Wind</td>
<td>10 mph Wind</td>
<td>15 mph Wind</td>
<td>20 mph Wind</td>
<td>Noticeable Wind</td>
<td>5 mph Wind</td>
<td>10 mph Wind</td>
<td>15 mph Wind</td>
<td>20 mph Wind</td>
<td>Noticeable Wind</td>
<td>5 mph Wind</td>
<td>10 mph Wind</td>
</tr>
<tr>
<td>-26 to -28</td>
<td>-15 to -19</td>
<td>(Normal Breaks) 1</td>
<td>(Normal Breaks) 1</td>
<td>75 min</td>
<td>2</td>
<td>55 min</td>
<td>3</td>
<td>40 min</td>
<td>4</td>
<td>Non-emergency work should cease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-29 to -31</td>
<td>-20 to -24</td>
<td>(Normal Breaks) 1</td>
<td>75 min</td>
<td>2</td>
<td>55 min</td>
<td>3</td>
<td>40 min</td>
<td>4</td>
<td>30 min</td>
<td>5</td>
<td>Non-emergency work should cease</td>
<td></td>
</tr>
<tr>
<td>-32 to -34</td>
<td>-25 to -29</td>
<td>75 min</td>
<td>2</td>
<td>55 min</td>
<td>3</td>
<td>40 min</td>
<td>4</td>
<td>30 min</td>
<td>5</td>
<td>Non-emergency work should cease</td>
<td></td>
<td></td>
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<tr>
<td>-35 to -37</td>
<td>-30 to 34</td>
<td>55 min</td>
<td>3</td>
<td>40 min</td>
<td>4</td>
<td>30 min</td>
<td>5</td>
<td>Non-emergency work should cease</td>
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<tr>
<td>-38 to -39</td>
<td>-35 to 39</td>
<td>40 min</td>
<td>4</td>
<td>30 min</td>
<td>5</td>
<td>Non-emergency work should cease</td>
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<tr>
<td>-40 to -42</td>
<td>-40 to 44</td>
<td>30 min</td>
<td>5</td>
<td>Non-emergency work should cease</td>
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<td>-43 &amp; below</td>
<td>-45 &amp; below</td>
<td>Non-emergency work should cease</td>
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</table>

Schedule applies to any 4-hour work period with moderate to heavy work activity; with warm-up periods of ten (10) minutes in a warm location and with an extended break (e.g. lunch) at the end of the 4-hour work period in a warm location.  

*Adapted from ACGIH 2012 TLVs*
During the winter months, maintenance teams work hard to make sure roadways are prepared to handle hazardous weather conditions. Through the use of de-icing/anti-icing agents, salt spreaders, and snowplows, road crews work to ensure your safety. However, the traveling public should also use every resource available to improve their own safety. During winter weather conditions, make sure that you:

- Remove snow and ice from your vehicle before you drive
- Ensure headlights and taillights are functioning properly - limited visibility during snow storms makes this paramount
- Accelerate slowly and approach bridges, shaded spots, and turns slowly

Vehicle maintenance is also an important, but often neglected aspect of driving safety. During the winter months, your vehicle's engine, tires, brakes, wipers, and other parts are all taxed to their design limits. Making sure they are operating and functioning properly is vital to being in a safe position on the road.

Check out this guide released by the Texas Department of Transportation with tips on how to winterize your vehicle, resources to get information about road conditions, and what parts of your car to check to complete a full auto safety check.

The Texas Department of Transportation will receive $7 million in grant funding from the Federal Transit Administration's (FTA) Buses and Bus Facilities Infrastructure Investment Program to provide funds to rural transit providers throughout the state to purchase new buses. The program helps rural transit agencies purchase buses and related equipment and to construct bus-related facilities.

"We are grateful to our federal partners for these resources that will help transport rural Texans to work, medical appointments and other necessary destinations," said Marc Williams, TxDOT deputy executive director. "Providing newer buses to our rural transit providers means providing more efficient travel for Texans in need."

When combined with other available funding, the grant will replace up to 275 of over 1,600 fleet used to provide rural area services, updating overall fleet condition through 2019. The vast majority of Texas rural transit districts will receive funding based on replacement needs.

The public transportation funds administered by TxDOT support transit programs serving 41 percent of the state's population and cover more than 96 percent of the state's land area. Residents of these areas use these transit services to get to work, school, shopping and medical appointments.

The full listing of all FTA Transportation awards can be found here.

For media inquiries, contact TxDOT Media Relations at MediaRelations@txdot.gov or (512) 463-8700.
Roadways don’t build themselves. They require careful planning, construction and regular maintenance, all of which require work zones designed to keep both workers and travelers safe.

Sometimes those measures fail. According to the Texas Department of Transportation (TxDOT), in 2017, there were 27,148 work zone crashes in Texas. Of those, 199 were fatalities, and 813 resulted in serious injuries. TxDOT and other state and national agencies responsible for building and maintaining our transportation system are consistently looking for ways to decrease those numbers. Rear-end collisions can occur more frequently due to slow-downs and traffic congestion during roadway construction.

Consider the concept of accelerated construction — building the system faster, smarter and with a goal to make it last longer — in the context of safety. One might think that doing things faster inherently means doing them less safely, but Texas A&M Transportation Institute (TTI) Senior Research Engineer Jerry Ullman looks at it a different way. “Reducing the duration of the project is a big safety win, actually,” says Ullman, manager of TTI’s Work Zone and Dynamic Signs Program. “Each additional day a work zone exists increases the chance of a crash occurring in it.”

Ullman and his team recently completed National Cooperative Highway Research Program (NCHRP) Project 17-61, Analysis of Work Zone Crash Characteristics and Countermeasures. TTI performed an in-depth analysis of crash narratives to better understand why crashes occur in work zones.

“It was no surprise to anyone that rear-end collisions and sideswipes with another vehicle or barrier are the most common types of crashes due to slow-downs and the congestion that naturally occurs during construction,” Ullman says. “Driver confusion upon approaching a work zone, as well as work vehicles entering and exiting the area are also significant factors.”

Rear-end collisions can occur more frequently due to slow-downs and traffic congestion during roadway construction.

The advent of intelligent transportation systems offers solutions to some of the issues uncovered by analyzing the crash narratives. For example, TTI led the deployment of an end-of-queue warning system as part of its support for TxDOT during the I-35 Reconstruction Project. Since 2011, the 96-mile widening and safety improvement effort between Hillsboro and Salado, Texas, has spanned a multitude of work zones that, literally, see hundreds of thousands of cars a day pass through them. Deploying the end-of-queue warning system upstream of a work zone — and warning travelers of slow-downs before they happen — has helped reduce crashes by up to 55 percent. Other options, like rumble strips, can also alert drivers to upcoming safety hazards.

“Mitigating the interactions between the traveling public and work vehicles entering and exiting the work space is also important,” Ullman explains. “Designing access points to allow work vehicle/equipment deceleration and acceleration out of the main travel lanes before entering or exiting a work area can reduce conflicts and crashes, as can the use of technology to warn approaching motorists of slower moving construction vehicles and equipment when they are actually present.”

As part of the NCHRP project, researchers developed Estimating the Safety Effects of Work Zone Characteristics and Countermeasures: A Guidebook. The guidebook assists traffic planners developing phasing and staging plans for temporary traffic control through work zones to better evaluate the expected safety impacts of their plans. Those stages are crucial to successful accelerated-construction efforts, and maximizing safety when planning them is just as vital.

"NCHRP’s guidebook helps planners understand the safety implications of alternative work zone designs under consideration," Ullman says. "It also provides information on how effective the various crash mitigation strategies are at saving lives."

As we look for ways to improve our transportation system — to make it faster, less expensive to build and longer lasting — improving safety is always of paramount importance. That emphasis has to start with the work zones themselves, before a single square foot of asphalt is ever laid down.

Reprinted with permission from Texas Transportation Researcher, Volume 54, Number 3.
According to national traffic data from the U.S. Department of Transportation, severe and fatal crashes are on the rise across the country, increasing 5.6 percent from 2015 to 2016.

Two crash types in particular pose a significant challenge – those resulting from roadway lane departures and pedestrian-involved incidents. In fact, these two crash types combined account for more than 65 percent of roadway fatalities nationwide. In Texas, single vehicle, roadway lane departure crashes resulted in 1,313 deaths or 35.29% of all motor vehicle traffic deaths in 2017. Pedestrian-involved fatalities totaled 671 in 2017.

The Reducing Rural Roadway Departures innovation includes multiple analysis, diagnostic, and countermeasure selection tools that can help agencies identify areas on their network that are at highest risk for rural roadway departures. Practitioners can then systemically apply safety treatments that mitigate these crashes and are in sync with their State’s Strategic Highway Safety Plan (SHSP).

Analyse which countermeasures will be most effective in improving the safety of roadways,

To help reduce these crashes, the fifth round of the FHWA Every Day Counts (EDC-5) program includes innovations dedicated to helping State and local agencies address these crash types.

The Reducing Rural Roadway Departures innovation is new for EDC-5 and the Safe Transportation for Every Pedestrian (STEP) effort was so successful in EDC-4 that it was selected to continue in round 5. The deployment teams that support these innovations will spend the next 2 years promoting proven safety countermeasures and best practices to help reduce these crash types through technical assistance, outreach, training, and more.

However, substantial safety improvements can be difficult to make because of the sheer size of the rural road network. There are almost three million miles of rural roadway in America, accounting for approximately 70 percent of public road mileage. That network is most often operated by local agencies with limited resources in safety analysis or planning.

Two-thirds of all rural roadway fatalities involve a roadway departure, where a vehicle crosses a center line, an edge line, or leaves the traveled way where there are no pavement markings. But with so many miles of rural roadways, it can be difficult to select the locations where applying roadway departure countermeasures will do the most good.
of its roads. In this case, the agency can still expect to see improved safety if edge lines are systemically applied to areas of high risk for roadway departure.

Roadway departure countermeasures that can be applied systemically include:

- Signing and markings to delineate lane edges and alignment changes, helping drivers navigate.
- Rumble strips to alert drowsy and distracted drivers drifting from their lane.
- Friction treatments at curves or other at-risk locations to reduce loss of control.
- Shoulders, the SafetyEdgeSM, and clear zones to provide opportunities for a safe recovery when drivers leave the roadway.
- Crashworthy roadside hardware to help reduce the severity of roadway departure crashes.

This initiative seeks to help rural districts in State DOTs as well as regional planning organizations and rural local agencies to analyze which countermeasures will be most effective in improving the safety of their roadways, where to apply those countermeasures, and how to apply them effectively.

**SAFE TRANSPORTATION FOR EVERY PEDESTRIAN (STEP)**

In 2016, the Nation witnessed the most pedestrian fatalities since 1990, with pedestrians accounting for approximately 16 percent of all roadway fatalities (5,987). The vast majority of these deaths (72 percent) occurred while people crossed a roadway at mid-block (or other locations away from intersections), while 18 percent of these fatalities occurred at intersections.

By focusing on both urban and rural pedestrian crossing locations, agencies can comprehensively address a significant national safety problem and improve the quality of life for pedestrians of all ages and abilities. The STEP innovation deployment team will promote and help agencies implement the following cost-effective countermeasures. These countermeasures can also be applied using a systemic approach to reduce these crashes and bring measured safety benefits at uncontrolled and signalized pedestrian crossing locations.

Mid-block pedestrian crossing location with crosswalk visibility enhancements. Photo courtesy of VHB.

- Rectangular rapid flash beacons (RRFBs) are active (user-actuated) or passive (automated detection) amber LEDs that use an irregular flash pattern. They can be placed at mid-block or uncontrolled crossing locations and significantly increase driver yielding behavior.
- Leading pedestrian intervals (LPIs) at signalized intersections allow pedestrians to walk—usually 3 to 4 seconds—before vehicles get a green signal to turn left or right. The LPI increases visibility for pedestrians, reduces conflicts, and improves vehicular yielding.
- Road diets can reduce vehicle speeds and the number of lanes pedestrians cross, and they can create space to add new pedestrian facilities such as pedestrian crossings and refuge islands.
- Pedestrian hybrid beacons (PHBs) provide positive stop control in areas with high pedestrian traffic volumes. The PHB is an intermediate option between a flashing beacon and a full pedestrian signal.
- Pedestrian crossing/refuge islands allow pedestrians a safer place to stop at the midpoint of the roadway before crossing the remaining distance. This is particularly helpful for older pedestrians or pedestrians with limited mobility.
- Raised crosswalks can serve as a traffic calming measure and reduce vehicle speeds.
- Crosswalk visibility enhancements, such as crosswalk lighting and enhanced signage and markings, help drivers detect pedestrians—particularly at night.
- With more and more drivers and pedestrians on the roads every year, and roadway fatalities on the rise, now is a key time to address two of our most persistent roadway safety issues.

For more information about the Reducing Rural Roadway Departures innovation, please contact Cate Satterfield at cathy.satterfield@dot.gov. For more information about the STEP innovation, please contact Becky Crowe at rebecca.crowe@dot.gov. To learn about the full series of EDC-5 innovations, please visit the EDC-5 web page.
The Federal Highway Administration recently published a Notice of Funding Opportunity (NOFO) in the Federal Register for rural states to compete for $225 million in Competitive Highway Bridge Program (CHBP) grants.

“Bridges are an integral part of our infrastructure, and these funds will help rural states ensure that their bridges remain safe and well-maintained,” said U.S. Transportation Secretary Elaine L. Chao.

By law, the funds are restricted to states with a population density of less than 100 people per square mile. Twenty-five states qualify: Alabama, Alaska, Arizona, Arkansas, Colorado, Idaho, Iowa, Kansas, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Vermont, West Virginia and Wyoming.

The funds must be used for highway bridge replacement or rehabilitation projects on public roads that leverage the efficiencies associated with “bundling” at least two highway bridge projects into a single contract.

“This program represents an important funding source to repair and replace bridges,” said Deputy Federal Highway Administrator Brandye L. Hendrickson. “Bundling projects will relieve rural bridge owners of administrative burden and capitalize on buying in bulk which will make it easier for bridge repairs or replacement projects to begin.”

Congress funded the CHBP grant program in the Consolidated Appropriations Act of 2018, from the U.S. Treasury’s General Fund. State Departments of Transportation in the eligible states are invited to apply under the program.

The NOFO is available at the Federal Register.
The Federal Highway Administration (FHWA) recently announced it is pursuing an update to the “Manual on Uniform Traffic Control Devices for Streets and Highways” (MUTCD) in preparation for the future of automated vehicles and to afford states and local communities with more opportunities to utilize innovation.

“The new manual will be forward-looking in accommodating technologies necessary to support highway connectivity, automation and innovations that improve safety and efficiency,” Deputy Federal Highway Administrator Brandye L. Hendrickson said. “The revised edition will lay the groundwork for supporting the infrastructure of the future.”

The MUTCD update was announced as part of USDOT’s release of new federal guidance for automated vehicles -- “Preparing for the Future of Transportation: Automated Vehicles 3.0.”

The MUTCD is the national standard for traffic signs, signals, and pavement markings. The last edition was published in 2009 and was revised in 2012. The upcoming new edition will propose to update the technical provisions to reflect advances in technologies and operational practices, incorporate recent trends and innovations, and set the stage for automated driving systems as those continue to take shape.

The publication of a new edition will propose to streamline processes and reduce burdens on state and local agencies by adopting many of the successful devices that have resulted from some of the 150 official experiments that FHWA has approved, including congestion-reduction strategies such as variable speed limits, dynamic lane control and shoulder use and pedestrian safety enhancements such as the rectangular rapid-flashing beacon and crosswalk marking patterns. Overall, the new edition will propose to allow more flexibility and innovation to improve travel for drivers, pedestrians and bicyclists.

Hendrickson added that FHWA’s goal was to ensure that the MUTCD improve the public’s travel experience – whether driving on the interstate or in a large city, small town or rural America—and that FHWA was being responsive to stakeholders who requested an update to the MUTCD.

As part of the process of updating the Manual, FHWA will seek input from the public nationwide, including state and local traffic engineers, traffic control device technicians and other stakeholders. The proposed changes are expected to be released for public review and comment next spring.

The FHWA has administered the MUTCD since 1971 and has published six editions. The MUTCD was first published in 1935 to establish uniform and easily recognizable traffic control features on the highways as car travel increased. While technologies and travel trends have evolved since 1935, the need for uniformity—for the safe and efficient movement of road users—still remains today.
Before Hurricane Harvey came ashore in August 2017 in Harris County, TX, its ferocity was not a constant.

When hurricanes form, “we have a 120-hour window” to get people out, said Harris County Judge Ed Emmett, who presented the Occupational Keynote at the 2018 National Safety Council Congress & Expo which was held in Houston from October 20th – 26th.

“Harvey was a hurricane, then it came across Mexico’s Yucatan Peninsula and dissipated, went back to a tropical storm and nobody was worried,” said Emmett, who also serves as the county’s Director of Homeland Security and Emergency Management. “Then, within 48 hours, it was a Category 4 hurricane. For six nights, it was brutal.”

Emmett said his emergency management team practices for such catastrophic storms “all the time,” adding that “hurricanes are easy compared to Harvey.”

According to the Harris County Flood Control District website, the county’s maximum rain measurement for seven days during Harvey was 47.4 inches, and more than two dozen rain gauges around the county measured at least 40 inches.

The unpredictability of storms such as Harvey was one of the key lessons Emmett and his team learned.

“Now we’ve had two storms – Harvey and Michael (in October 2018) – that came up from a tropical storm to a Category 4 or Category 5 storm in about 40 to 48 hours,” Emmett said. “Our timeline is 120 hours to get people out, so we’ve got to rethink that.”

The first, and perhaps most important, lesson Emmett shared was the need for constant communication.

“Communication between all the groups involved (is important),” he said. “Communication among the city, county, state, the Red Cross and everybody is vital. What’s more vital is the communication to the public. The public has to know what is going on.”

With a major disaster, media coverage and failures of various agencies can cause hurdles. Emmett said it is important for his team to avoid such distractions. “When you’re in the midst of a crisis, you need to be solving the crisis,” he said.

During most emergency situations, Emmett said he believes in letting trained team members do their jobs and empowering them to make decisions. “Don’t let them be afraid of doing their job,” he said.

Whether it is working with his staff, other agencies or the public, Emmett said people are the most important factor.

““In the end, it always comes back to people,” he said. “How we respond to a crisis comes back to people – us, the people who work for us and the people we serve.”

Some of the most rewarding work Emmett has done, he said, is dealing with emergencies. “You all understand safety,” he told the audience. “That’s your life. The emergency management piece is something I take very seriously and very personally.”

From the emergency operations center in Harris County, Emmett and his team of 50 full-time employees spent six nights monitoring weather, roads, shelters and a variety of impacts of Harvey.

“We have the largest, best, most technologically advanced emergency operations center in the country,” he said. “It looks like a casino floor. We have 98 workstations. When we’re activated, we have everybody from federal military access all the way down to local nonprofits.”

Emmett said his team assisted local agencies this year in Florida and the Carolinas.

“We know what to do,” he said. “We have a lot of moving parts. Everybody knows what their job is. When people say, ‘Are you ready for the next storm?’ Yeah, we’re ready. But every one is different.”

More than a year later, Emmett said he still is moved by the efforts of first responders and private citizens, such as the “Cajun Navy,” a group of hundreds of Louisiana citizens with boats who drove into Harris County to rescue people from flooded homes.

“To this day, I have no idea how they got here,” he said. “The roads were flooded. They helped save a lot of people. And our first responders were out there day after day after day.”
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While training and information sharing at conferences or through a newsletter can do a lot of good, TXLTAP recognizes sometimes there is just nothing like rolling up your sleeves, experiencing the problem first hand and then offering a meaningful solution. That’s why in addition to hosting classes and publishing Better Roads, Safer Roads, our program offers local roadway agencies an opportunity to consult directly with a TXLTAP subject matter expert to specifically address your organization’s unique issue. And like all resources TXLTAP offers, there is no charge to receive our help or expertise.

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