BETTER ROADS SAFER ROADS

ALERT & ALIVE

HOW TO REDUCE WORKER FATIGUE AND DISTRACTION RISKS

WORK-ZONE WARNINGS DELIVERED TO YOUR SMART PHONE

TEXAS SAFETY PERFORMANCE TARGETS

- TxLTAP -

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UNIVERSITY OF TEXAS ARLINGTON

BETTER ROADS
SAFER ROADS

Summer 2017 – TxLTAP.org

- TxLTAP -

The Local Technical Assistance Program (LTAP) is a nationwide effort financed by the Federal Highway Administration and individual state departments of transportation. Its purpose is to translate into understandable terms the best available technology for roadways, bridges, bicycle and pedestrian facilities, and public transportation for city and county roadway and transportation personnel. The TxLTAP, operated by the University of Texas at Arlington, is sponsored by the Texas Department of Transportation (TxDOT) and the Federal Highway Administration. This newsletter is designed to keep you informed about new publications, techniques, and training opportunities that may be helpful to you and your community.

FEDERAL HIGHWAY ADMINISTRATION LAUNCHES ROADWAY SAFETY HARDWARE MICROSITE

New site to improve public's access to information about guardrail performance.

The Federal Highway Administration (FHWA) recently launched a "microsite" on the agency's website to provide a central resource for information about guardrails and other roadside safety hardware.

The new site is the latest in an ongoing effort to emphasize the importance of, and improve accessibility to, state guardrail data – including preliminary data from an In-Service Performance Evaluation (ISPE) pilot program.

"Safety is our top priority and enhanced data will improve road safety," said Acting Deputy Federal Highway Administrator Butch Waidelich. "Our goal is to provide state DOTs with information they can use to make the right decisions for their states."

Notably, the site will make it possible for state DOTs to share data about in-service performance of roadside hardware by hosting an ever-expanding collection of findings from the states in response to interest about performance guardrail terminals.

The site will highlight FHWA's ISPE pilot – which began in 2015 and will continue through 2019 – being conducted jointly with California, Massachusetts, Missouri and Pennsylvania to find better ways to collect in-service performance data of roadside hardware. The site will also serve as the foundation of a publicly accessible database about guardrails used along America's highways.

Waidelich said federal officials recognize the lack of state-based information on roadside hardware, and that the ISPE will improve roadway safety by making it easier for states to uniformly collect performance data on guardrails

The microsite can be accessed by visiting safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/guardrail_ispe.cfm.

REDUCING WORKER FATIGUE & DISTRACTION RISKS

Each year, 120 highway workers are killed on the job, and thousands are seriously injured. One major cause of these accidents is fatigue. Fatigue makes you careless, distracted, slower to react and forgetful - much like excessive drinking. You wouldn't show up to a dangerous job site drunk, so don't show up fatigued either!

COUNTER FATIGUE THROUGH THESE TIPS

✓ GET ADEQUATE SLEEP

Be sure to get two full nights (7 hours each) before working the night shift.

If intermittent day and night work shifts are required, establish a 4-hour anchor sleep time each 24-hour period and supplement with naps.

✓ TAKE NAPS

The best naps are 10-12 minutes long. Perfect for during lunch breaks.

Long naps (2 hours) in the mid-afternoon prior to the night shift help reduce sleep debts.

✓ TAKE CARE OF YOUR HEALTH

Make exercise/stretching part of the daily routine.

Stay hydrated with water.

✓ KEEP LOOKING OUT FOR OTHERS

Watch for signs of fatigue in others.

Report unsafe behavior of a co-worker to a supervisor. Remember that lives are on the line.

Maintaining constant awareness of the many potential hazards on the job site is difficult even when you are refreshed and focused. It can be nearly impossible to maintain if you are drowsy or distracted. Working while extremely tired and sleepy can be as dangerous as working while drunk. As more work is being done at night or extended weekend shifts, the potential for worker fatigue increases. Fatigue can accumulate over time and continue to desensitize you to risks.

Distractions can also keep you from maintaining risk awareness on the job. Your cell phone or smart device is one of the biggest distractors. While most agencies prohibit use of personal devices while working, more and more equipment and work tasks rely on workers utilizing these devices for job duties. Use of such devices reduces work accuracy and increases reaction times. In fact, someone using one of these devices can actually experience "risk blindness," where hazards that are normally very visible are not even noticed.

To combat the risks of worker fatigue and distraction due to electronic devices, a new awareness and training initiative has been developed. The theme of this initiative as ALERT & ALIVE. The premise is that, unlike video games, where players can be virtually reborn after being killed, there are no "do-overs" if an accident occurs at a real-world job site. Tips for reducing risks on the job from being fatigued or distracted with electronic devices have been incorporated into posters and tip cards that can be accessed at WorkZoneSafety.org. In addition, two short (20-minute) on-line training modules have been developed, one for workers and one for managers and supervisors. These modules illustrate how fatigue and distraction affect safety on the job-site, and educate the viewer on ways to mitigate those effects.

For more information, visit workzonesafety.org/topics-of-interest/reducing-worker-fatigue-and-distraction-risks/.

TEXAS WORK ZONE FATALITIES INCREASE FOR THE SECOND STRAIGHT YEAR

In 2016, Texas work zone fatalities increased 27 percent, resulting in 181 lost lives. Of those fatalities, 174 (96 percent) were motorists, pedestrians and bicyclists.

"People often think work zone crashes result in the deaths of roadside workers, but statistics show the vast majority of these fatalities are drivers like you and me who are passing through as motorists," said TxDOT Executive Director James Bass.

"We urge you to pay attention and adhere to posted traffic signs when driving through work zones to ensure your safety and the safety of the men and women who are working on our roads. At the end of the day, we want everyone to return home safely to their loved ones."

TxDOT reminds drivers that every single day requires caution when driving through work zones. As the state's population continues to boom, the price of progress can mean more than 2,500 active TxDOT work zones at any given time. In 2016, there were 25,814 work zone crashes in Texas. The leading causes of fatal work zone crashes statewide – speeding and failure to stay in a single lane – are entirely preventable.

"People often think work zone crashes result in the deaths of roadside workers, but statistics show the vast majority of these fatalities are drivers like you and me,"

- TxDOT Executive Director James Bass.

By law, drivers are required to move over or slow down when approaching work crews, emergency vehicles or tow trucks stopped on the roadside or shoulder with flashing blue or amber lights. Traffic fines in work zones double when workers are present and can cost up to $2,000.

As part of its ongoing Work Zone Awareness campaign, TxDOT is partnering with Austin-based Texas Mutual Insurance Company to host events around the state. An integral part of Texas Mutual's mission – helping employers prevent workplace incidents and minimizing their consequences – aligns with TxDOT's Work Zone Awareness efforts.

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NEW NHTSA.GOV AIMS TO MAKE ROADS SAFER

Each year, hundreds of thousands of people visit nhtsa.gov, the U.S. Department of Transportation's National Highway Traffic Safety Administration website. These parents, driver educators, motor vehicle researchers, advocates, and the driving public are all in search of the same thing—information that will help create a safer driving environment for themselves, their loved ones, and the public.

In December 2016, NHTSA launched a new NHTSA.gov to make it easier to find important information related to traffic safety. From recalls to safety tips, the new site is a helpful tool that supports NHTSA's goal of eliminating traffic fatalities and major injuries on the Nation's roadways.

WHAT'S DIFFERENT

The new site is designed for the public. Topics are presented in easy-to-understand terms and organized to reflect the way consumers think about safety on the Nation's roads. Using the latest Web technology, best practices in user experience, and responsive design, the site puts popular topics at the fingertips of any user, whether via smartphone, tablet, or computer.

For those looking to discover behavioral issues associated with safety, NHTSA's aim is to educate. The agency presents its primary topics in a simple manner: (1) What is the problem? (2) What is NHTSA doing about it? and (3) What is the end result? For those who want to dig deeper, keyword tagging and improved search capabilities enable users to find the latest information on a given topic.

The site includes new features and functionality to improve the user experience and make it easier to find more information in one place. For example, the technical team developed an application program interface that, for the first time, pulls information from NHTSA's safety defects database, its 5-Star Safety Ratings, and from manufacturers to present a complete picture of a vehicle's safety profile.

One of the key features of the new site is the Safe Cars Save Lives section on the home page. A simple tool enables consumers to enter a vehicle identification number (VIN)—or the year, make, and model of a vehicle—and immediately get all of the latest recall information, crash test ratings, and safety updates related to that specific vehicle.

WHAT'S THE SAME

All the data, research, stats, legal documentation, and resources that NHTSA has provided to various stakeholders for years remain on the site. At the top right corner of the navigation are direct links to the agency's rich library of information: "Research & Data," "Laws & Regulations," and "Information For." The latter offers a dropdown menu to select topics by user type: parents and caregivers, those looking to import a vehicle, and vehicle manufacturers. Stakeholders can either self-select from the navigation or use the primary search tool to find the latest reports, research, and data on a topic.

A SITE THAT SAVES LIVES

The new NHTSA.gov consolidates all of the agency's content into one cohesive site. Previously, this information was spread across multiple Web sites, including SaferCar.gov. Now consumers can access the site anywhere, from any device. NHTSA encourages the public to visit the site and explore the new features offered.

"People turn to the National Highway Traffic Safety Administration every day for critical, life-saving news and information that directly impacts their lives," says Jack Danielson, NHTSA's executive director. "Whether you are on your phone or sitting at your desk, the new Web site makes finding safety information faster and easier. We believe that better access to life-saving information can help all Americans travel safely on our roadways."

For more information, visit nhtsa.gov or contact Lucia Sanchez at 202-366-2564 or lucia.sanchez@dot.gov.

NEW TOOL HELPS YOU MONITOR HEAT SAFETY AT YOUR WORKPLACE

An updated app for smart phones and other mobile devices can help workers stay safe when working outdoors in hot weather. The free app was redesigned by CDC's National Institute for Occupational Safety and Health (NIOSH), along with the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA).

The OSHA-NIOSH Heat Safety Tool mobile app, for iOS and Android devices, determines heat index values – a measure for how hot it feels – based on temperature and humidity. Workers exposed to hot and humid conditions, including construction workers, landscapers, farmers, and others, are encouraged to use the app to check weather conditions if they will be outdoors for short or long periods during the summer heat.

"With the hot summer months on our doorstep, this app is a valuable tool for employers and workers to help prevent heat-related illnesses," said John Howard, M.D., director of NIOSH. "In many cases, workers rely on their employers to provide opportunities for taking rest breaks and drinking water. This app puts life-saving information at the fingertips of both supervisors and workers to inform them when they need to take precautions to stay safe at the worksite."

EXTREME HEAT CAN BE DEADLY

Extreme heat causes more deaths than any other weather-related hazard; each year more than 65,000 people seek medical treatment for extreme heat exposure. In 2014 alone, 2,630 workers suffered from heat-related illness, and 18 died from heat stroke and related causes on the job, according to OSHA.

Work-related exposure to heat can also result in reduced productivity and growing risk of injuries, such as those caused by sweaty palms, fogged-up safety glasses, and cognitive impairment (that is, mental confusion, impaired judgment, and poor coordination).

The app, an updated version of OSHA's original Heat Safety Tool, uses the device's geolocation capabilities to pull temperature and humidity data from National Oceanic and Atmospheric Administration satellites to determine the heat index. The app shows the current risk level (minimal, low, moderate, high, or extreme) and forecasts the hourly heat index throughout the entire workday giving employers information they can use to adjust the work environment as needed to protect workers.

"We applaud NIOSH for updating this important worker safety tool. Workers are most vulnerable in the first few days of working in the heat and the app helps users to calculate risk levels and learn the protective measures they can take to prevent heat illness," said Dorothy Dougherty, Deputy Assistant Secretary of Labor for Occupational Safety and Health. "Being aware of the risks, gradually building a tolerance, and taking the

WORK-ZONE WARNINGS COULD SOON BE DELIVERED TO YOUR SMARTPHONE

Reprinted from the Minnesota CTS Catalyst Newsletter, April 2017.

Imagine that you're driving to work as usual when your smartphone announces, "Caution, you are approaching an active work zone." You slow down and soon spot orange barrels and highway workers on the road shoulder. Thanks to a new app being developed by University of Minnesota researchers, this scenario is on its way to becoming reality.

"Drivers often rely on signs along the roadway to be cautious and slow down as they approach a work zone. However, most work-zone crashes are caused by drivers not paying attention," says Chen-Fu Liao, senior systems engineer at the U's Minnesota Traffic Observatory. "That's why we are working to design and test an in-vehicle work-zone alert system that announces additional messages through the driver's smartphone or the vehicle's infotainment system."

As part of the project, sponsored by the Minnesota Department of Transportation (MnDOT), Liao and his team investigated the use of inexpensive Bluetooth low-energy (BLE) tags to provide in-vehicle warning messages. The BLE tags were programmed to trigger spoken messages in smartphones within range of the tags, which were placed on construction barrels or lampposts ahead of a work zone.

The researchers also developed two applications for the project. First, they designed a smartphone app to trigger the audio-visual messages in vehicle-mounted smartphones entering the range of the BLE work-zone tags. A second app allows work-zone contractors to update messages associated with the BLE tags remotely, in real time, to provide information on current conditions such as workers on site, changes in traffic, or hazards in the environment.

Field tests proved the system works. "We found that while traveling at 70 miles per hour, our app is able to successfully detect a long-range BLE tag placed more than 400 feet away on a traffic barrel on the roadway shoulder," Liao says. "We also confirmed the system works under a variety of conditions, including heavy traffic and inclement weather."

"This was a proof of concept that showed that smartphones can receive Bluetooth signals at highway speeds and deliver messages to drivers," says Ken Johnson, work-zone, pavement marking, and traffic devices engineer at MnDOT. "Future research will look into how we should implement and maintain a driver alert system."

This future work includes using the results of a human factors study currently under way at the U's HumanFIRST Laboratory to create recommendations for the in-vehicle message phrasing and structure. Then, researchers plan to conduct a pilot implementation with multiple participants to further evaluate the system's effectiveness.

According to MnDOT, another phase of the project may investigate how to effectively maintain the BLE tag database. This phase could also investigate implementation options, such as how MnDOT can encourage drivers to download and use the app.

necessary precautions can keep workers safe and save lives."

HOW TO STAY SAFE OUTDOORS IN EXTREME HEAT

In addition to calculating the heat index, the app provides users with specific NIOSH and OSHA recommendations for protection against the heat based on the calculated risk level. This includes information about staying cool, proper hydration, and scheduling rest breaks. Recommendations are based on the 2016 publication NIOSH Criteria for a Recommended Standard: Occupational Exposure to Heat and Hot Environments, which was recently updated to reflect the latest science.

Some examples of NIOSH recommendations that can be applied in many different outdoor workplaces include:

- Limit time in the heat and/or increase recovery time in a cool environment.
- Increase the number of workers per task.
- Train supervisors and workers about heat stress, including symptoms of heat-related illness, first aid, and risk factors.
- Use a buddy system where workers observe each other for signs of heat intolerance.
- Provide adequate amounts of cool, potable water near the work area and encourage workers to drink frequently.
- Use a heat alert program (additional written guidelines) whenever the weather service forecasts that a heat wave is likely to occur.
- Develop a plan to get employees acclimatized to hot weather and to increase physical fitness.

For more information on heat-related illnesses, visit cdc.gov/niosh/topics/heatstress. To install the OSHA-NIOSH Heat Safety app on your iOS or Android device, visit cdc.gov/niosh/topics/heatstress/heatapp.html.

SOLVING THE SAFETY PERFORMANCE MEASURES PUZZLE

by Michael S. Griffith

Performance management is evident in all aspects of society, from grade school report cards to workplace reviews. Performance can be measured in subjective and objective ways—and in combination. For example, judges score a gymnast's performance according to both execution (subjective) and difficulty (objective). When it comes to highway safety, the performance measures that matter most are objective: the number of lives lost and serious injuries sustained.

For more than 4 decades, the National Highway Traffic Safety Administration's Fatality Analysis Reporting System has collected data on highway fatalities. "When it comes to data on serious injuries resulting from crashes, no national data system currently exists," says Terry Shelton, the acting executive director of NHTSA. "States collect this information, but not all States define injuries in the same way."

But that is all starting to change. The Federal Highway Administration recently adopted new requirements that place greater focus on the numbers behind highway safety performance. Safety performance management is part of FHWA's overall Transportation Performance Management program—a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. The recent safety performance management final rule established requirements for safety performance measures that support the Highway Safety Improvement Program (HSIP) and help assess serious injuries, as well as fatalities, on all public roads.

FILLING THE DATA GAP

To improve the quality and consistency of data, the U.S. Department of Transportation established a national definition for serious injuries in 2016. FHWA's National Performance Management Measures regulation (23 CFR Part 490, Subpart B) and NHTSA's Uniform Procedures for State Highway Safety Grant Programs Interim Final Rule (23 CFR Part 1300) establish a single, national definition for serious injuries, aligned with the definition provided by the fourth edition of the Model Minimum Uniform Crash Criteria (MMUCC).

> *"When it comes to data on serious injuries resulting from crashes, no national data system currently exists."*
>
> *—Terry Shelton, NHTSA Acting Executive Director*

In 2015, FHWA determined that only 3 out of the 57 jurisdictions—50 States, the District of Columbia, the Indian Nations, and 5 U.S. territories—surveyed were using the definition in the MMUCC fourth edition. The executive committee of USDOT's Traffic Records Coordinating Committee created a subcommittee made up of representatives from FHWA, NHTSA, and the Federal Motor Carrier Safety Administration to assist in implementing the new reporting requirements.

States need to report serious injuries using this definition by April 15, 2019, but "the Department encourages States to begin using it on or before January 1, 2019, to produce a consistent and compliant dataset for the entire year," says Elizabeth Alicandri, associate administrator for safety at FHWA.

USDOT is developing resources to help States obtain and report standard and consistent data on serious injuries. These resources include guidance and technical assistance for stakeholders (primarily State highway safety offices, departments of transportation, and law enforcement agencies), fact sheets, and frequently asked questions to assist States with their compliance efforts.

The Department also is planning outreach timed with the release of the fifth edition of the MMUCC in summer 2017 to highlight the importance of adopting the uniform definition and outline the changes required of States to comply. In addition, USDOT is developing training resources, including a video on classifying suspected serious injuries, to ensure that law enforcement officers have the tools they need to apply the updated definition effectively.

WHAT'S NEXT?

The uniform definition for reporting serious injuries is an important step toward determining the right countermeasures to support the goal of improving safety on the Nation's roadways. In a perfect world, being able to link crash data to hospital data, where medical professionals can share their input on injury severity, would help ensure even more accurate and consistent reporting on injuries. Until then, USDOT stands ready to assist States in compiling the data on serious injuries necessary to help solve the safety puzzle.

ACCURATE AND CONSISTENTLY REPORTED DATA ON SERIOUS INJURIES IS A CRITICAL MISSING PIECE OF THE PUZZLE THAT TRANSPORTATION PROFESSIONALS NEED TO IMPROVE THE SAFETY PERFORMANCE OF THE NATION'S ROADWAYS.

TEXAS SAFETY PERFORMANCE TARGETS

TxDOT recently met with the Strategic Highway Safety Plan (SHSP) stakeholder and executive teams to discuss and finalize SHSP Safety Targets and SHSP Branding. The SHSP targets have to be consistent with the Highway Safety Plan (HSP) Targets and the Highway Safety Improvement Program (HSIP) Targets. The HSP and HSIP Targets have to be identical. The SHSP utilized a data-driven, multi-year, collaborative process to establish safety targets. The consensus of the SHSP stakeholder and executive teams is to utilize a methodology of establishing targets that would result in a 2% reduction from the original trend line projection in 2022.

WHEN THE SLOPE ANALYSIS PROJECTS A NEGATIVE SLOPE, THE TARGET SET WILL MIRROR THE PROJECTION DETERMINED BY THE SLOPE. BASED UPON THAT DIRECTION, DRAFT TARGETS WERE CALCULATED FOR THE 5 COMMON PERFORMANCE MEASURES AS FOLLOWS:

Target: Total number of traffic fatalities
2018 Target: To decrease the expected rise of fatalities from 3,516 in 2015 to not more than 3,891 fatalities in 2018

The 2018 Target expressed as a five year rolling average would be as follows:

Year	Source	Projection or Actual Data	Percent Reduction	Target or Actual Data
2014	FARS	FARS	N/A	3,536
2015	ARF	ARF	N/A	3,516
2016	CRIS	CRIS	N/A	3,775
2017	Target	Target	0.0%	3,801
2018	Target	Target	0.4%	3,891
	2018 Target expressed as 5-year average			3,703.8

*based upon linear trend analysis from 2011-2015 FARS data

Target: Total number of incapacitating injuries
2018 Target: To decrease the rise of serious injuries from 17,578 serious injuries in 2016 to not more than 18,130 serious injuries in 2018

The 2018 Target expressed as a five year rolling average would be as follows:

Year	Source	Projection or Actual Data	Percent Reduction	Target or Actual Data
2014	CRIS	17,133	N/A	17,133
2015	CRIS	17,096	N/A	17,096
2016	CRIS	17,578	N/A	17,578
2017	Target	17,890*	0.0%	17,890
2018	Target	18,203*	0.4%	18,130
	2018 Target expressed as 5-year average			17,565.4

*based upon linear trend analysis from 2012-2016 CRIS data

Target: Deaths per 100 million vehicle miles traveled
2018 Target: To decrease the expected rise of deaths per 100 MVMT from 1.36 deaths per 100 MVMT in 2015 to not more than 1.46 deaths per 100 MVMT in 2018

The 2018 Target expressed as a five year rolling average would be as follows:

Year	Source	Projection or Actual Data	Percent Reduction	Target or Actual Data
2014	FARS	1.45	N/A	1.45
2015	ARF	1.36	N/A	1.36
2016	CRIS	1.44	N/A	1.44
2017	Target	1.45*	0.0%	1.45
2018	Target	1.46*	0.4%	1.46
	2018 Target expressed as 5-year average			1.432

*based upon linear trend analysis from 2011-2015 FARS data

Target: Serious Injuries per 100 million vehicle miles traveled
2018 Target: To decrease the rate of serious injuries per 100 MVMT from 6.71 serious injuries per 100 MVMT in 2016 to 6.64 serious injuries per 100 MVMT in 2018

The 2018 Target expressed as a five year rolling average would be as follows:

Year	Source	Projection or Actual Data	Percent Reduction	Target or Actual Data
2014	CRIS	7.05	N/A	7.05
2015	CRIS	6.62	N/A	6.62
2016	CRIS	6.71	N/A	6.71
2017	Target	6.68*	0.0%	6.68
2018	Target	6.64*	0.0%	6.64
	2018 Target expressed as 5-year average			6.740

*based upon linear trend analysis from 2012-2016 CRIS data

Target: Total number of non-motorized fatalities and serious injuries
2018 Target: To decrease the expected rise of non-motorized fatalities and serious injuries from 2,023 in 2015 to not more than 2,309 non-motorized fatalities and serious injuries in 2018

The 2018 Target expressed as a five year rolling average would be as follows:

Year	Source	Projection or Actual Data	Percent Reduction	Target or Actual Data
2014	FARS-CRIS	1,893	N/A	1,893
2015	FARS-CRIS	2,023	N/A	2,023
2016	CRIS	2,304	N/A	2,304
2017	Target	2,224*	0.0%	2,224
2018	Target	2,318*	0.4%	2,309
	2018 Target expressed as 5-year average			2150.6

*based upon linear trend analysis from 2011-2015 FARS and CRIS data

THE PROPOSED REDUCTION OF 2% BY 2022, WHICH ONLY APPLIES TO POSITIVE SLOPE PROJECTION TRENDS, WOULD BE ACHIEVED BY REDUCING EACH INTERMEDIATE YEAR BY THE FOLLOWING REDUCTION PERCENTAGES:

YEAR	REDUCTION	YEAR	REDUCTION
2017	0.0%	2020	1.2%
2018	0.4%	2021	1.6%
2019	0.8%	2022	2.0%

THE 10 STATES WITH THE DEADLIEST COUNTRY ROADS

A national non-profit transportation research group releases "Rural Connections: Challenges and Opportunities in America's Heartland." The report rates states by pavement condition, structurally deficient bridges, and fatality rate.

Rural roads need major updating to continue supporting activities that provide the rest of us with energy, food, and fiber. Crashes and fatalities are two-and-a-half times higher in rural areas, where populations are aging and increasingly diverse, than elsewhere in the nation; 10% of bridges are structurally deficient; and more than one-third of roads are in poor or mediocre condition.

That's the bottom line of Rural Connections: Challenges and Opportunities in America's Heartland, a report from The Road Improvement Program (TRIP) in Washington, D.C., a national non-profit transportation research group.

Slightly less than half - 48% - of rural roads are in good condition, 16% are in fair condition, 21% are in mediocre condition, and 15% are in poor condition. Deaths increased in 2015 after decreasing every year between 2012 and 2014.

In 2015, non-interstate rural roads had a fatality rate of 2.18 deaths for every 100 million vehicle miles of travel (VMT) compared to 0.83 deaths per 100 million VMT for all other roads.

THE ROAD IMPROVEMENT PROGRAM

"Rural roads are far too often overlooked. With fatality rates rising, repairing and maintaining the nation's roads must be a top priority for legislators," said Kathleen Bower, AAA senior vice president of public affairs and international relations.

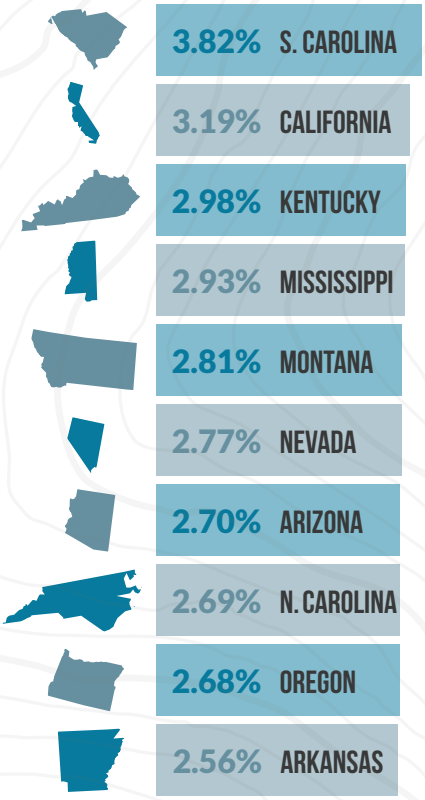
"By investing in improvements for today and tomorrow, we can deliver safer experiences for motorists and save tens of thousands of lives."

The quality of life in America's small communities and rural areas, and the health of the nation's rural economy, is highly reliant on the quality of the nation's transportation system, particularly its roads, highways and bridges. America's rural transportation system provides the first and last link in the supply chain from farm to market, connects manufacturers to their customers, and supports tourism industry.

To address these challenges, Congress must provide a long-term, dedicated, user-based revenue stream capable of fully funding the federal surface transportation program.

"Farmers and ranchers depend on rural roads, highways and bridges to move their products to market," said Zippy Duvall, president of the American Farm Bureau Federation. "Transportation delays and costs take a bite out of our profitability and competitiveness and impact the quality of rural life. Securing the appropriate

THE TOP 10:
FATALITY RATE PER 100M VMT ON RURAL ROADS



- **3.82%** S. CAROLINA
- **3.19%** CALIFORNIA
- **2.98%** KENTUCKY
- **2.93%** MISSISSIPPI
- **2.81%** MONTANA
- **2.77%** NEVADA
- **2.70%** ARIZONA
- **2.69%** N. CAROLINA
- **2.68%** OREGON
- **2.56%** ARKANSAS

resources at the local, state and federal levels will allow for the improvements needed to provide a rural transportation system that will keep goods moving and foster economic growth."

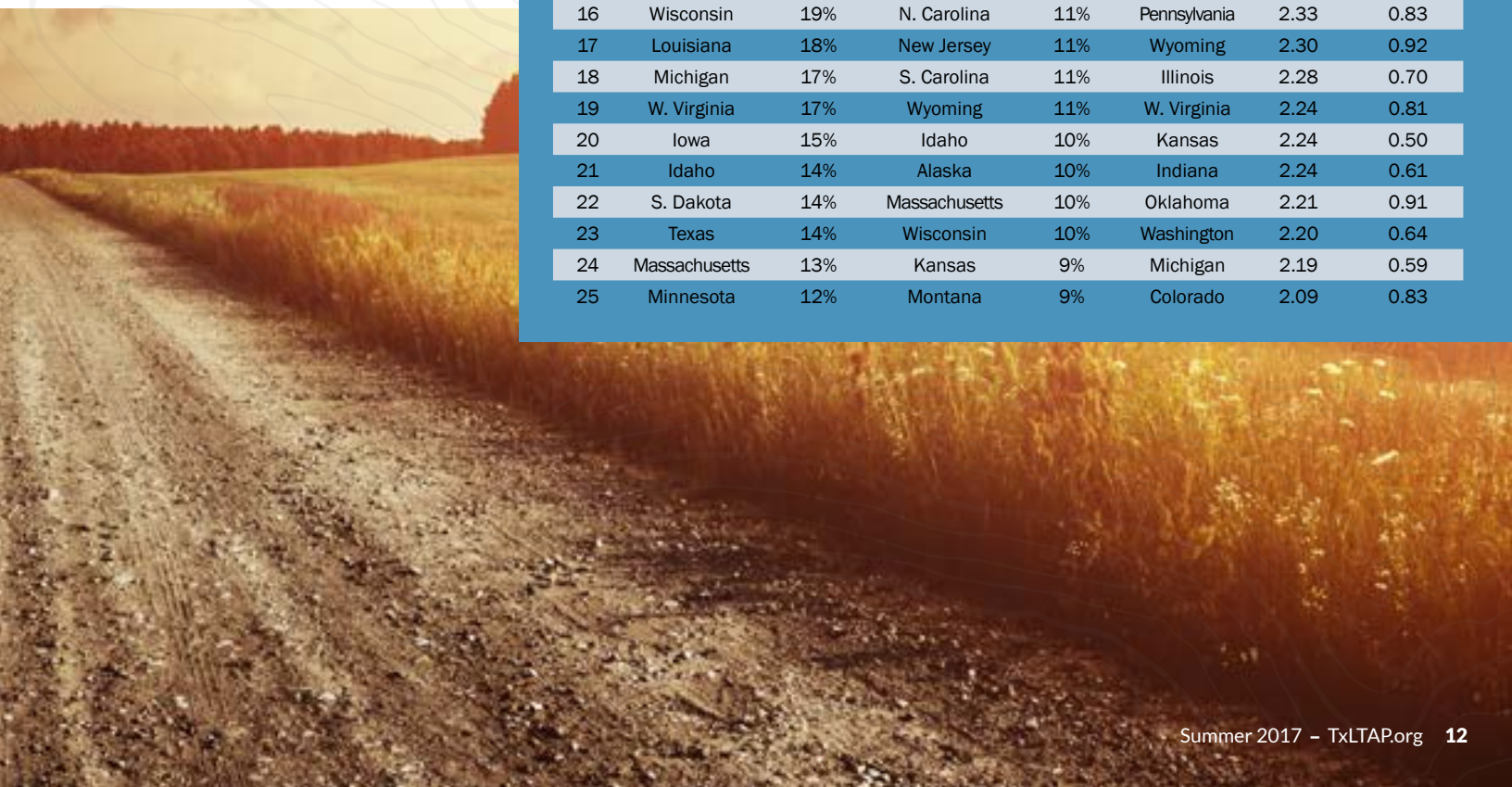
"The safety and quality of life in America's small communities and rural areas and the health of the nation's economy ride on our rural transportation system. The nation's rural roads and bridges provide crucial links from farm to market, move manufactured and energy products, and provide access to countless tourism, social and recreational destinations," said Will Wilkins, executive director of TRIP. "Fixing the federal Highway Trust Fund with a long-term, sustainable source of revenue that supports the transportation investment needed will be crucial to the modernization of our rural transportation system."

Reprinted from Public Works Magazine - June 2017

THE DATA

The Road Improvement Program

RANK	STATE	RURAL ROADS IN POOR CONDITION	STATE	STRUCTURALLY DEFICIENT RURAL BRIDGES	STATE	FATALITY RATE PER 100M VMT ON RURAL ROADS	FATALITY RATE PER 100M VMT ON OTHER ROADS
1	Rhode Island	41%	Rhode Island	22%	S. Carolina	3.32	1.03
2	Connecticut	39%	Iowa	22%	California	3.19	0.66
3	California	38%	Pennsylvania	22%	Kentucky	2.98	0.72
4	Hawaii	28%	S. Dakota	20%	Mississippi	2.93	0.70
5	Mississippi	25%	W. Virginia	17%	Montana	2.81	0.86
6	New Mexico	25%	Nebraska	16%	Nevada	2.77	1.06
7	Vermont	24%	Oklahoma	16%	Arizona	2.70	1.15
8	Pennsylvania	22%	N. Dakota	16%	N. Carolina	2.69	0.65
9	Arkansas	22%	Louisiana	15%	Oregon	2.68	0.64
10	Oklahoma	22%	Maine	15%	Arkansas	2.56	0.90
11	Missouri	21%	Missouri	14%	Virginia	2.46	0.51
12	Washington	21%	Mississippi	13%	Louisiana	2.46	1.16
13	Alaska	20%	New York	13%	Texas	2.43	1.09
14	Virginia	20%	N. Hampshire	13%	Tennessee	2.35	0.91
15	Maine	19%	Michigan	13%	Georgia	2.35	0.96
16	Wisconsin	19%	N. Carolina	11%	Pennsylvania	2.33	0.83
17	Louisiana	18%	New Jersey	11%	Wyoming	2.30	0.92
18	Michigan	17%	S. Carolina	11%	Illinois	2.28	0.70
19	W. Virginia	17%	Wyoming	11%	W. Virginia	2.24	0.81
20	Iowa	15%	Idaho	10%	Kansas	2.24	0.50
21	Idaho	14%	Alaska	10%	Indiana	2.24	0.61
22	S. Dakota	14%	Massachusetts	10%	Oklahoma	2.21	0.91
23	Texas	14%	Wisconsin	10%	Washington	2.20	0.64
24	Massachusetts	13%	Kansas	9%	Michigan	2.19	0.59
25	Minnesota	12%	Montana	9%	Colorado	2.09	0.83



ISEEFLOOD CELL PHONE APPLICATION NOW AVAILABLE ON IPHONES

D.J. Seo, a UTA civil engineer and hydrologist has expanded his weather-watching audience by making the iSeeFlood cell phone app available to iPhone users. The app, developed in 2016, was initially available only for Android cell phones. It is now available for iPhones. iSeeFlood encourages the public to file timely reports when they see flooding of varying severity on the streets, in and around their homes, and in streams and creeks. Such flash floods can be dangerous to pedestrians and motorists alike. Any advantage in knowing where, when and how fast flash-flooding is occurring can save lives and property.

"Urban flood management has become an integral part of planning and services in metropolitan areas like North Texas," Seo said. "We need big data and crowd-sourcing approaches to assemble needed information is especially needed in urban areas where so much development is taking place."

For iSeeFlood, Seo is collaborating with DeepStratus, a technology company based in northern Virginia to improve the app and data display. "We are hopeful that the collaboration with DeepStratus will help UTA take this cell phone application worldwide," Seo said. "This crowd-sourcing tool can not only inform the citizens for real-time decision making but also help build the data we need to understand and cope with flash flooding worldwide in a more intelligent and data-driven way."

Seo said DeepStratus is also harvesting weather-related tweets and social media posts to help collect and build the data needed to make informed decisions on flash flooding and to advance flood science.

"Urban flood management has become an integral part of planning and services in metropolitan areas like North Texas," Seo said. "We need big data and crowd-sourcing approaches to assemble needed information is especially needed in urban areas where so much development is taking place."

Since last year, Seo's team has also been installing about two dozen innovative wireless sensors around creeks, streams and flash-flooding zones in Fort Worth, Dallas, Grand Prairie and Arlington to improve high-resolution modeling of urban water systems. The sensors recorded and transmitted information about how much water was flowing, providing additional data to help the cities and National Weather Service make quicker and more accurate forecasts and alerts.

"But it's too expensive to put up sensors wherever flash flooding data are needed," Seo said. "That's why we need to rely on crowd-sourcing and this phone app is a great way to gather the data we need."

Ali Abolmaali, UTA Department of Civil Engineering chair and Dr. Tseng Huang Endowed Professor, said Seo's work will help design changes in how North Texas is built.

"Once the data are collected, it's invaluable to the cities where they came from," Abolmaali said. "I could see this kind of phone app and data collection spreading across the globe."

The iSeeFlood app and the wireless sensors are research outcomes of Integrative Sensing and Prediction of Urban Water for Sustainable Cities, a joint project among The University of Texas at Arlington, University of Michigan and University of Massachusetts Amherst. The project is supported by a $1.2 million National Science Foundation grant Seo received in 2014 to improve sustainability of large urban areas affected by extreme weather, urbanization and climate change through the NSF's Cyber-Innovation for Sustainability Science and Engineering, or CyberSEES, program.

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Visit iseeflood.org for an interactive display.

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TXLTAP EVENT & WORKSHOP SCHEDULE

Registration required, no charge to participate.

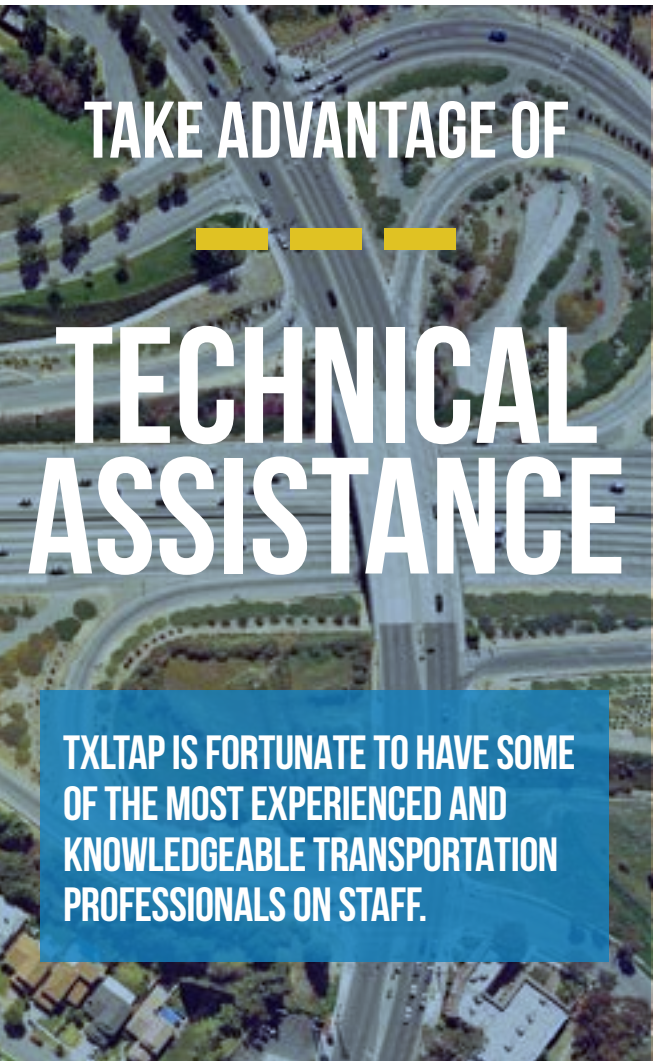
For more information or to secure a spot, visit txltap.org or contact the TxLTAP office at 817-272-9678, txltap@uta.edu.

SEPTEMBER 19, 2017
HEAVY EQUIPMENT FOR WILDFIRES
BRADY, TX
MCCULLOCH COUNTY

NOVEMBER 27, 2017
SNOW AND ICE WORKSHOP
DUMAS, TX
MOORE COUNTY

NOVEMBER 29, 2017
SNOW AND ICE WORKSHOP
LAMESA, TX
DAWSON COUNTY

DECEMBER 14, 2017
HEAVY EQUIPMENT EXPO
BURLESON, TX
TARRANT COUNTY



TAKE ADVANTAGE OF TECHNICAL ASSISTANCE

TXLTAP IS FORTUNATE TO HAVE SOME OF THE MOST EXPERIENCED AND KNOWLEDGEABLE TRANSPORTATION PROFESSIONALS ON STAFF.

This staff includes retired maintenance managers, heavy equipment operators, road crew chiefs, civil and transportation engineers, inspectors, and the public works directors who all worked on the state's road system and in a nutshell "have been there, done that." Now Texas' local roadway agencies can directly benefit from their street smarts.

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.

Do you need information on proper method for fixing your lingering road problem? Would it help if someone came out to watch your road crew perform a repair and offer suggestions on how to save time and money in the future? Could you use the help of a traffic engineer who could assess a problematic intersection? Would it be a benefit to you if a subject matter expert came to ride the roads and developed a training presentation specific to your needs?

Take advantage of our technical assistance service!
Call 817-272-9678 or email us at txtlap@uta.edu. We're ready to help!

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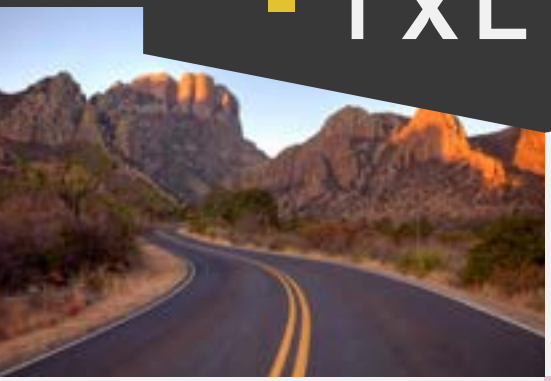

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