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# BETTER ROADS SAFER ROADS

## PAVEMENT PRESERVATION

### When, Where, and How

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# BETTER ROADS
# SAFER ROADS

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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.

# USDOT GIVES STATES MORE FLEXIBILITY IN FEDERALLY FUNDED HIGHWAY PROJECTS

In late September 2019, the U.S. Department of Transportation's Federal Highway Administration (FHWA) published an updated federal rule to give states more flexibility and choice in which products or services can be used on federally funded highway projects. The change is intended to improve safety and increase efficiency while saving taxpayer dollars.

"This much-needed update of a century-old, obsolete rule will benefit state transportation infrastructure projects and save millions of taxpayer dollars," said U.S. Transportation Secretary Elaine L. Chao.

The rule updates an outdated federal requirement that restricts the ability of states to use patented or proprietary technology in their Federal-aid highway projects.

"This final rule promotes innovation by empowering states to choose which state-of-the-art materials, tools, and products best meet their needs for the construction and upkeep of America's transportation infrastructure," said Federal Highway Administrator Nicole R. Nason.

Prior to this change, federal regulations prohibited state contracting agencies from using federal funds to acquire patented or proprietary materials, products, or services, except under certain limited circumstances.

The new rule went into effect on October 28, 2019. It can be viewed online at federalregister.gov.

# PAVEMENT PRESERVATION — WHEN, WHERE, AND HOW

**Applying a pavement preservation treatment at the right time (when), on the right project (where), with quality materials and construction (how) is a critical investment strategy for optimizing infrastructure performance.**

Whether a highway pavement is constructed using asphalt, concrete or a composite system, traffic loads and environmental elements will contribute to its deterioration over time. Pavement preservation treatments can slow this structural decline. When the right treatment is applied at the right time with quality materials and construction, these practices offer a proven, cost-effective approach to extending the overall service life of pavements and achieving smoother, safer roads with fewer costly repairs.

*Whether it is a failed patch, stone flying off a chip seal, or a microsurfacing that peels off because it did not set, even a single failure and the associated damages can set back an agency's program for many years.*

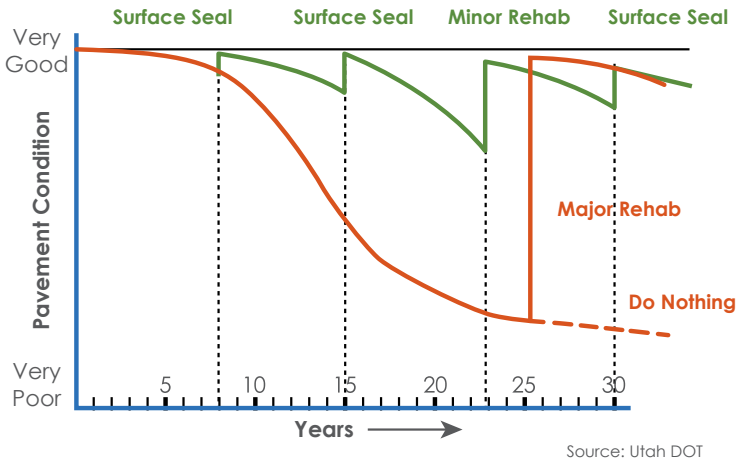
Just as pavements differ, so do pavement preservation treatments. There are an array of different analyses, treatments, and construction methods that can help infrastructure owners achieve and sustain a desired state of good repair for their transportation facilities—despite tight budgets.

The When and Where component of this innovation, as part of the fourth round of Every Day Counts (EDC-4), supports preserving highway investments by managing transportation pavements proactively. The How component promotes quality construction and materials practices, including treatment options that apply to both flexible and rigid pavements.

## PAVEMENT PRESERVATION: WHEN AND WHERE

Historically, pavement preservation programs have focused on applying specific project treatments at specific locations. These projects demonstrated that the proper application of a treatment could extend the life of a pavement at a relatively low cost. However, not all projects were successful due to poor timing, inappropriate treatments, substandard materials, and inexperienced construction crews. As a result, the policy in many agencies today is to allow pavements to deteriorate until reconstruction is the only option, resulting in higher costs and more pavements in poor condition.

**Pavement Management with *"Good Roads Cost Less"* Preservation Strategies**




Source: Utah DOT

The Pavement Preservation EDC-4 effort supports moving the preservation concept significantly forward. The focus today in transportation is on sustaining infrastructure through "whole-life" investments and quantifying the risks. Pavement preservation has a key role in managing pavements in these whole-life programs. Under current federal statute on asset management (23 USC 119) and on performance management (23 USC 150), states are required to include consideration of pavement preservation as part of their long-term business practices that support federal funding. This consideration extends to evaluating the benefits and costs related to the lifecycle analysis for pavements. The EDC-4 pavement preservation team is focused on assisting state departments of transportation in this effort.

## BENEFITS

- **Economy.** Whole-life planning for pavements defines expectations and risks for the long term and provides more stability to the cost of operating and maintaining highway pavements.
- **Performance.** Identifying preservation policies and strategies at the network level provides a cost-effective alternative for extending the performance period for pavements and reducing the need for frequent or unplanned reconstruction.

- **Sustainability.** A well-defined pavement strategy that includes preservation will aid in setting achievable performance targets.

## PAVEMENT PRESERVATION: HOW

Pavements deteriorate as a result of many different forces, but the predominant factors affecting pavement performance are the vehicle loads and environmental elements they are exposed to over their lifetime. Today, most highway agencies accept that an effective pavement preservation program will slow down the rate of pavement deterioration, while also providing a safer, smoother ride to the traveling public. Pavement preservation programs based on the 3Rs—right treatment, right pavement, and right time—have been proven to extend pavement life while saving money.

One obstacle to successful pavement preservation is the impact that treatment failures can have on an entire program. Whether it is a failed patch, stone flying off a chip seal, or a microsurfacing that peels off because it did not set, even a single failure and the associated damages can set back an agency's program for many years. However, most early failures can be attributed to a breakdown in some part of the construction process, such as the materials, site preparation, or placement practices, and as such are avoidable.

EDC-4 is promoting quality construction and materials practices that apply to both flexible and rigid pavements. For flexible pavements these include using improved specifications for thin asphalt surfacings such as chip seals, scrub seals, slurry seals, microsurfacing, and ultrathin bonded wearing courses; following improved construction practices; and using the right equipment to place these treatments. Rigid pavement strategies include the rapid retrofitting of dowel bars to reduce future faulting; the use of new, fast-setting partial- and full-depth patching materials to create a long-lasting surface; advanced pavement removal techniques to accelerate patching construction times; and advancements in diamond grinding that contribute to smoother and quieter pavement surfaces with enhanced friction.

Far too often, the past response to a construction failure has been to introduce bans or moratoriums on using treatments that have otherwise been proven effective. By following the best practices for materials selection and construction practices, pavement preservation will be less disruptive and safer while also eliminating much of the "fix-the-fix" problems endemic to many conventional pavement repair and rehabilitation techniques. Improved construction practices and the associated reduction in construction-related failures allow agencies to continue to use treatments that are proven to be effective, enabling them to realize the benefits of these techniques.

## BENEFITS

- **Safety.** The treatments are typically installed in shorter work zones and during off-peak hours, reducing the likelihood of work zone incidents. Improved skid resistance is a key functional benefit of preservation.
- **Performance.** Successful construction practices contribute to improved pavement performance, providing smoother and safer roads and delaying the need for time-consuming and costly rehabilitation.
- **Flexibility.** Retaining a mix of successful treatments in the preservation toolbox provides agencies greater flexibility in placing the right treatment on the right pavement at the right time.
- **Savings.** Improved performance and fewer failures keep a pavement network in a state of good repair at a lower cost.

For information and technical assistance on the when and where component of pavement preservation, contact Thomas Van at thomas.van@dot.gov or Steve Gaj at stephen.gaj@dot.gov of the FHWA Office of Infrastructure. See the FHWA Asset Management Web page at www.fhwa.dot.gov/asset/ for resources.

For information and technical assistance on the how component of pavement preservation, contact James Gray at james.gray@dot.gov of the FHWA Office of Infrastructure. Visit the FHWA Pavement Preservation Web page at www.fhwa.dot.gov/pavement/preservation/ for resources.


# FHWA PUBLISHES PAVEMENT PRESERVATION CHECKLISTS

In an effort to assist state and local transportation agencies that are regularly tasked to do more with less funding, the Federal Highway Administration (FHWA) recently published an update to the Pavement Preservation Checklist Series. To assist in the ongoing pavement preservation, which includes a large component of the management and operations aspect of maintaining transportation infrastructure, FHWA worked with the National Concrete Pavement Technology Center (CP Tech) to update FHWA's Pavement Preservation Checklists.

Initially developed in 2002, FHWA's Pavement Preservation Checklist Series was developed to guide state and local highway maintenance and inspection teams on the use of innovative pavement preservation techniques.

The full 2019 Pavement Preservation Checklist Series is available for download in the TxLTAP Library or from the FHWA Pavements website.

**CHECKLIST SERIES UPDATE INCLUDES THE 23 TOPICS LISTED BELOW:**

1. Crack Treatment
2. Chip Seal
3. Thin Hot Mix Asphalt Overlay
4. Fog Seal
5. Micro Surfacing Application
6. Hot in Place Asphalt Recycling Application
7. Cold in Place asphalt Recycling Application
8. Slurry Seal Application
9. Fabric Interlayer Application
10. Full Depth Reclamation Construction
11. Asphalt Emulsion Based Tack Coat
12. Scrub Seal
13. HMA Asphalt Patching
14. High Friction Surface Treatments
15. Cape Seals
16. Ultrathin bonded wearing course
17. Joint and Crack Sealing
18. Diamond Grinding
19. Dowel Bar Retrofit
20. Partial Depth Repair
21. Full Depth Repair of Portland Cement Concrete Pavements
22. Cross-Stitching for Portland Cement Concrete Pavements
23. Longitudinal Diamond Grooving of Portland Cement Concrete Pavements

# NEARLY HALF OF ALL TEXAS TRAFFIC DEATHS COME FROM ENERGY-PRODUCING AREAS

Texas continues to lead the nation in oil and gas production, creating jobs and prosperity statewide, but communities in the state's main energy production areas have also seen a rise in deaths on the road accounting for close to half of all traffic fatalities in Texas.

In 2018, 1,673 people died and more than 6,000 were seriously injured in crashes in the Barnett Shale, Eagle Ford Shale, Granite Wash, Haynesville/Bossier Shale and Permian Basin, where oil and gas exploration is underway. Traffic deaths in these areas are up by 4% compared to 2017. Crash reports point to failure to control speed as the most-often cited factor in traffic crashes, followed by driver inattention due to actions such as looking at a cell phone.

"Driving conditions have changed dramatically in many parts of Texas," said Texas Department of Transportation Executive Director James Bass. "A big increase in the number of heavy trucks and traffic on state and county roads adds to the complexity of driving – something we always need to give our full attention to, while also obeying traffic laws. That's why we are urging every motorist to drive smart and take simple precautions to prevent crashes."

In the coming weeks, drivers can expect to see a variety of common-sense safety reminders as TxDOT kicks off its annual "Be Safe. Drive Smart." campaign in the state's energy-producing regions. The campaign reminds drivers to:

- Always buckle up—drivers and all passengers, day and night.
- Drive a safe speed that takes into account the amount of traffic, road conditions, and weather.
- Focus 100 percent on driving and put your phone away: no talking or texting when you're behind the wheel.
- Give large trucks plenty of space, be patient, and pass only when it's safe and legal to do so.
- Obey stop signs and traffic signals.
- Never drive under the influence of alcohol or other drugs.

TxDOT will be taking its safety messages to community events this month in the Permian Basin and Eagle Ford Shale. Drivers can test their street smarts at an interactive exhibit outfitted with games, quizzes, and video displays that remind motorists how to safely navigate the challenges of driving in high-traffic oil and gas production areas.

"Be Safe. Drive Smart." is a key component of #EndTheStreakTX, a broader social media and word-of-mouth effort that encourages drivers to make safer choices while on the road, such as going the speed limit, wearing a seat belt, and never drinking and driving or texting and driving. Nov. 7, 2000 was the last deathless day on Texas roadways. #EndTheStreakTX asks all Texans to commit to driving safely to help end the streak of daily deaths.

For media inquiries, contact TxDOT Media Relations at MediaRelations@txdot.gov or (512) 463-8700.

The information contained in this report represents reportable data collected from the Texas Peace Officer's Crash Report (CR-3). This information was received and processed by the department as of Sept. 11, 2019.

# DEATHS FROM CARS RUNNING RED LIGHTS HIT 10-YEAR HIGH

Between 2008 and 2017, there were 971 deaths on Texas roadways caused by drivers running red lights, according to crash data reports by the National Highway Traffic Safety Administration. Nearly half of the reported deaths were occupants in another vehicle other than the one driven by the red-light runner. Per capita, Texas has the 6th highest rate of red light running deaths of any state, tied with Kentucky.

**ACCORDING TO THE AAA FOUNDATION:**

- 28% of crash deaths that occur across the U.S. at signalized intersections are the result of a driver running through a red light.
- Per capita, Arizona has the highest rate of red light running fatalities while New Hampshire has the lowest rate.
- Nearly half (46%) of those killed in red light running crashes were passengers or people in other vehicles and more than 5% were pedestrians or cyclists. Just over 35% of those killed were the drivers who ran the red light.

*"Drivers who decide to run a red light when they could have stopped safely are making a reckless choice that puts other road users in danger"*

"Drivers who decide to run a red light when they could have stopped safely are making a reckless choice that puts other road users in danger," said Dr. David Yang, executive director of the AAA Foundation for Traffic Safety. "The data shows that red light running continues to be a traffic safety challenge. All road safety stakeholders must work together to change behavior and identify effective countermeasures."

According to the AAA Foundation's latest Traffic Safety Culture Index, 85% of drivers view red light running as very dangerous, yet nearly one in three say they blew through a red light within the past 30 days when they could have stopped safely. More than 2 in 5 drivers also say it is unlikely they'll be stopped by police for running a red light. Nevertheless, it's against the law and if a driver is involved in a deadly crash, it could send them to jail.

Changes in driver behavior are critical to reducing the number of red light running crashes on U.S. roads. To prevent red light crashes, AAA recommends that drivers:

- **Prepare to Stop:** Lift your foot off the accelerator and "cover the brake" when preparing to enter any intersection by positioning your right foot just above the brake pedal, without touching it.
- **Use Good Judgment:** Monitor "stale" green lights, those that have been green a long time as you've approached the intersection. They are more likely to turn yellow as you arrive at the intersection.
- **Tap the Brake:** Tap your brakes a couple of times before fully applying them to slow down. This will catch the attention of drivers who may be inattentive or distracted behind you.
- **Drive Defensively:** Before you enter an intersection after the light has turned green for you, take a second after the light changes and look both ways before proceeding.

Pedestrians and cyclists should also stay safe when traveling near intersections. AAA recommends:

- **Wait:** Give yourself a few seconds to make sure all cars have come to a complete stop before moving through the intersection.
- **Stay Alert and Listen:** Don't take chances and don't wear headphones. Watch what is going on and give your full attention to the environment around you.
- **Be Visible:** Stay in well-lit areas, especially when crossing the street.
- **Make Eye Contact:** Look at drivers in stopped vehicles to ensure they see you before crossing the road in front of them.

For more information on AAA's findings, contact Daniel Armbruster, AAA Texas - Corporate Spokesperson, at 512-564-3141 or armbruster.daniel@aaa-texas.com.

# PARTNERSHIPS - CRITICAL TO ACHIEVING ZERO DEATHS ON OUR ROADWAYS

*by Norah Ocel, P.E., FHWA Office of Safety*

In looking towards our transportation future, we emphasize innovation, what's next, and what will revolutionize roadway safety. Innovation is crucial, but the tried and true impact of working together toward a common goal is also important. That is what partnerships are all about.

FHWA's Office of Safety has always recognized the critical role of partnerships in advancing roadway safety. With the advent of the Towards Zero Deaths vision that is gaining momentum across the United States, working together across the 4 E's of transportation safety (engineering, enforcement, education, and emergency response) is more important than ever. It is a fundamental element to reaching zero deaths and serious injuries on our roadways.

*Meeting with stakeholders to discuss latest headlight research and testing. (Source: FHWA)*

One collaborative approach to reaching the zero goal is the safe systems approach, which acknowledges human fallibility and the shared responsibility we all have as part of the system (highway designers, users, and vehicles). While we move towards a safe systems approach, we continue to use data to make informed decisions, develop policies and regulations, and implement safety countermeasures to save lives. We also focus on maintaining and broadening our partnerships through a variety of venues in the transportation community.

For instance, FHWA is partnering with the National Safety Council to assist with its Road to Zero Coalition. Many agencies and private sector organizations are part of this coalition, whose goal is zero road fatalities by the year 2050. The FHWA Office of Safety continues to support this coalition by being an integral part of promoting and implementing its three core strategies—double down on what works, accelerate advanced technology, and prioritize safety—and providing technical support for each one of them.

Through the years, the Office of Safety has met with non-profit organizations to discuss topics related to safety on our roadways. These interactions serve as a platform to share information and best practices, but also to spark innovative ways to improve safety.

The Office of Safety also collaborates with other Federal agencies, such as the National Highway Traffic Safety Administration and Federal Motor Carrier Safety Administration to discuss how we can be better partners across the 4Es of highway safety.

*National Roadway Safety Awards. (Source: FHWA)*

The importance of our partners is celebrated through the National Roadway Safety Awards, which is co-sponsored by FHWA's Office of Safety and the Roadway Safety Foundation. These awards honor agencies/organizations in the transportation community that have made significant strides towards zero deaths and serious injuries on our nation's roadways.

Every two years, this prestigious awards program examines the "best of the best" projects based on criteria including effectiveness, innovation, and efficient use of resources. For more than two decades, this program has provided the winning teams with well-deserved top industry honors and helped shine a spotlight on these heroes of highway safety. Selected projects are included in a noteworthy practices guide so they can be replicated nationwide.

In closing, partnership is sometimes defined as a contractual relationship between two or more persons associated as joint principals in a business. In our case, we are all joint principals in the business of saving lives. It takes the right personalities, energy, and purpose to make partnerships last through the years to achieve a common goal. Once formed, strong partnerships are a simple yet critical tool in safety, and what better outcome than getting to zero together.

For more information about the partnership initiatives, please contact Norah Ocel at norah.ocel@dot.gov.

*Article reprinted from the Federal Highway Administration's Fall 2019 issue of Safety Compass.*

# TXDOT PLANNING THE FUTURE OF TRANSPORTATION IN TEXAS - SEEKING INPUT ON TEXAS TRANSPORTATION PLAN

*The future possibilities are intriguing, and TxDOT wants to know what Texans think will be the most pressing transportation needs for the next 30 years.*

TxDOT is hosting a second round of public meetings to gather public input that will be essential to developing the state's long-range transportation plan, which helps inform the direction for the future of Texas' multimodal transportation system. The Texas Transportation Plan 2050, or TTP 2050, will guide TxDOT's planning and programming for the next 30 years and set long-range goals for all forms of transportation.

Texans who can't make the meetings in person can participate online by visiting www.txdot.gov and searching for "TTP 2050". TxDOT is providing an interactive survey to gather public input. The virtual open house also features a transportation usage survey. This second round of public involvement follows a series of public meetings conducted earlier this year. Anyone who previously participated online, or who attended an open house, is encouraged to continue their involvement as there will be new information and additional opportunities to comment.

To receive information or submit comments, email TTP_2050@txdot.gov or call the toll free messaging center at 1-855-TEXAS50 (839-2750). All meeting materials will be available at www.txdot.gov via searching "TTP 2050" on the site.

Persons with disabilities who plan to attend and who may need assistance, or persons with special communication needs or who need an interpreter, should contact Casey Dusza at (512) 486-5149 or casey.dusza@txdot.gov at least three business days prior to the meeting so that appropriate arrangements can be made. Every reasonable effort will be made to accommodate these needs.

**Online surveys closed Friday, November 15, 2019, however public comments will be accepted throughout the development of the TTP 2050 until early 2020.**

Written comments can be submitted via email at TTP_2050@txdot.gov or by USPS mail to:
TxDOT TPP Division – TTP 2050
Attn: Casey Dusza
P.O. Box 149217
Austin, Texas 78714-9217

# A HOLISTIC APPROACH TO ROADWAY SAFETY MANAGEMENT

*by Stuart Thompson, FHWA Office of Safety, and Frank Gross and Tim Harmon, VHB*

The intent of a roadway safety management program is to identify and improve sites expected to benefit the most from targeted, cost-effective treatments. The following are two complementary approaches that together represent a holistic approach to managing roadway safety:

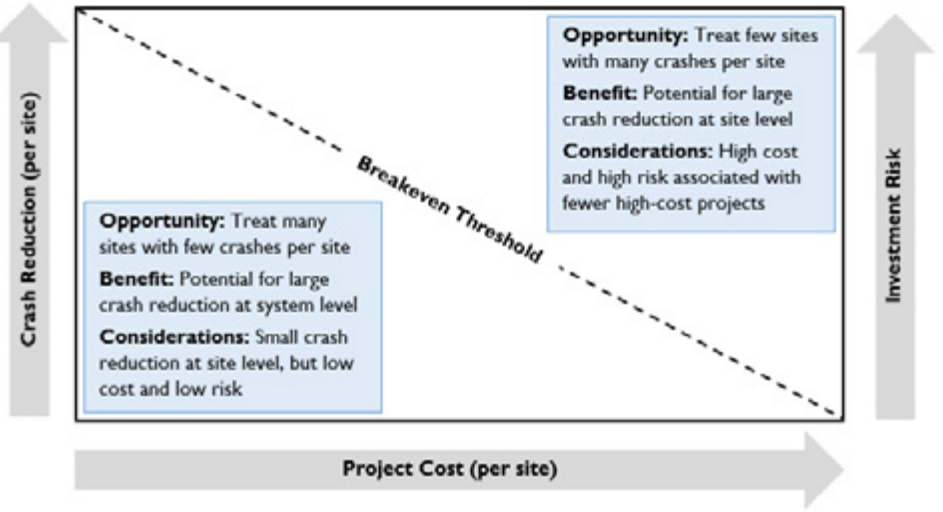
1. **Spot approach:** select and treat sites based on site-specific crashes.
2. **Systemic approach:** select and treat sites based on site-specific geometric and operational attributes known to increase crash risk.

The spot approach allows for higher-cost and higher-effectiveness projects, particularly when targeting high-crash locations. The systemic approach provides an opportunity to address many locations through relatively lower-cost projects. While spot projects have the potential to produce large crash reductions at the treated locations, these projects also carry a higher investment risk due to the higher cost. Systemic projects are typically less effective (i.e., reduce fewer crashes) per site compared to the spot approach; however, systemic projects have the potential for large crash reductions at the network level. The Framework for Identifying Breaking Point for High-cost and Low-cost Projects diagram illustrates the differences and the need to find an appropriate balance between the two approaches.

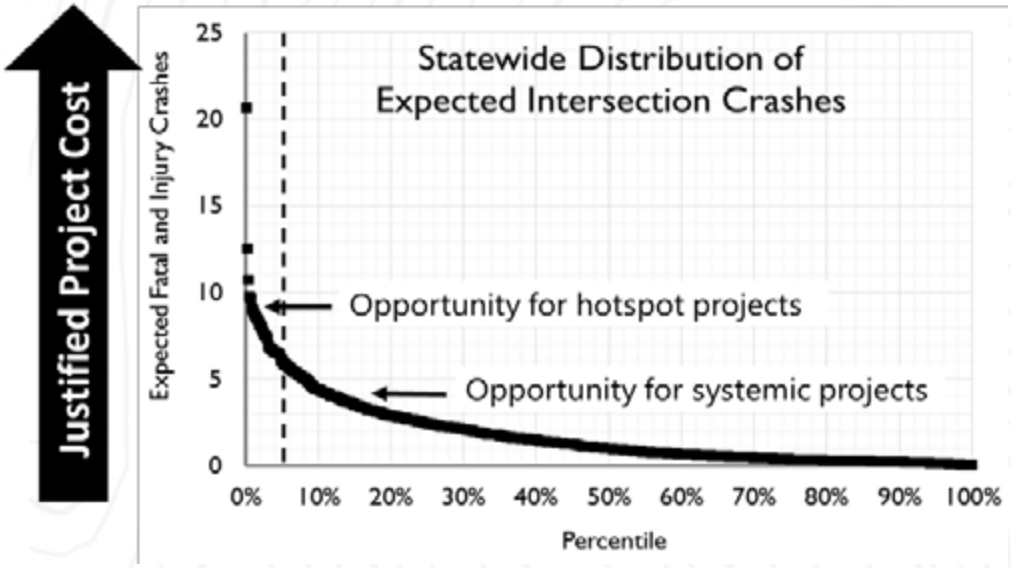
## THE CHALLENGE

Safety program managers are challenged with selecting projects and allocating resources to maximize the program's return on investment. Agencies can address a few higher-crash locations with higher-cost improvements, address many lower-crash locations with lower-cost improvements, or some combination of the two. A common question is how to allocate funding between spot and systemic projects to achieve the maximum return on investment, improve safety performance, and make progress toward strategic objectives.

The Statewide Distribution of Expected Fatal and Injury Crashes diagram illustrates a typical distribution for expected fatal and injury crashes across a State highway network. All sites are predicted to have some level of crash frequency, but relatively few sites have many expected crashes, and many sites have few expected crashes. The goal of a highway safety program is to reduce the area under the curve—by basic calculus, this area reflects the overall safety performance of the network, represented here by the expected fatal and injury crashes.




*Framework for Identifying Breaking Point for High-cost and Low-cost Projects. (Source FHWA)*




*Statewide Distribution of Expected Fatal and Injury Crashes. (Source FHWA)*

Agencies have many options for achieving the goal of reducing fatal and serious injury crashes. Each option (i.e., portfolio of projects) will vary in terms of the cost and expected effectiveness. High-cost projects may be a sound investment at sites with the highest expected crashes, particularly when there is a clear opportunity for a large crash reduction. High-cost investments do not present the same potential return at sites with lower expected crash frequencies, however. Instead, an investment strategy focused on low-cost improvements with a modest return on investment per site may be more

appropriate to address sites with lower expected crash frequencies. This helps to gain some economies of scale with respect to mobilization, preliminary engineering, and other planning costs.

In either case, a program based solely on spot projects or solely on systemic projects will not achieve the goal of significantly reducing traffic fatalities and serious injuries on all public roads. While spot projects have the potential to substantially reduce crashes at a given location, this will have limited impact on the safety performance of the entire system. Lower-cost projects can produce a substantial impact on the safety performance of the system; however, there may be a need for higher-cost improvements to effectively address the underlying crash contributing factors at locations with the highest expected crashes.

## THE OPPORTUNITY

To implement the holistic approach, agencies need to apply a benefit-cost framework based on estimated project costs, historical project effectiveness, and average crash costs. This framework can be applied at the project level (e.g., identifying the most cost-effective countermeasure for a given location) or program level (e.g., identifying the most cost-effective group of projects within a program budget).

As an example, consider different investment options for a $3 million safety program. The table below provides project costs, estimated benefits, and benefit-cost ratios for several proposed projects. Proposed projects A, B, and C are based on the spot approach, while proposed projects 1, 2, and 3 are based on the systemic approach. There are numerous combinations of investment options for a $3 million budget, and different options provide different returns on investment. Investing completely in the spot projects (A, B, and C), the total cost is $3 million, the total benefit is $30 million, and the benefit-cost ratio is 10:1. Investing completely in the systemic projects (1, 2, and 3), the total cost is $3 million, the total benefit is $30 million, and the benefit-cost ratio is 10:1.

However, given this level of information for each proposed project, an agency could select the most cost-effective projects that fit within the budget to maximize the return on investment. In this case, the agency would select spot project A, systemic project 1, and systemic project 2, resulting in a total cost of $3 million, total benefit of $37 million, and benefit-cost ratio of 37:1.

**EXAMPLE INVESTMENT OPTIONS.**

| Proposed Projects | Coverage | Project Cost | Estimated Benefit | Benefit-Cost Ratio |
|---|---|---|---|---|
| Spot Project A | 1 intersection | $1,000,000 | $11,000,000 | 11:1 |
| Spot Project B | 1 intersection | $1,000,000 | $10,000,000 | 10:1 |
| Spot Project C | 1 intersection | $1,000,000 | $9,000,000 | 9:1 |
| Systemic Project 1 | 100 intersections | $1,000,000 | $14,000,000 | 14:1 |
| Systemic Project 2 | 100 intersections | $1,000,000 | $12,000,000 | 12:1 |
| Systemic Project 3 | 100 intersections | $1,000,000 | $4,000,000 | 4:1 |

This type of framework is possible within the current capabilities of many transportation agencies. Agencies commonly estimate construction and maintenance costs as part of the project development process. Historical crash data and tools such as the Highway Safety Manual also make it possible to estimate the future safety performance of the no-build scenario. If an agency can determine the average project effectiveness and average crash costs, it is possible to estimate the future safety performance and monetary benefit of the proposed project. With this information, analysts can compare spot and systemic projects based on the benefit-cost ratio.

## SUMMARY

A holistic approach to managing roadway safety includes both spot and systemic projects. The spot approach helps agencies select projects that potentially cost more but also have greater potential effectiveness, particularly when targeting high-crash locations. The systemic approach enables agencies to address many locations through relatively lower-cost projects. Both approaches focus on preventing future crashes and reducing fatalities and injuries. Another commonality is focusing on sites with the greatest potential for safety improvement.

Regardless of which approach an agency uses, it is important to use reliable, data-driven methods to inform decisions and identify the optimal combination of projects to achieve a significant reduction in fatal and serious injury crashes.

For more information about how to implement a holistic, data-driven approach to managing roadway safety, contact Stuart Thompson at stuart.thompson@dot.gov.

*Article reprinted from the Federal Highway Administration's Fall 2019 issue of Safety Compass.*

**To Learn More, Check Out These Resources!**

*FHWA's Roadway Safety Data Program Toolbox contains a number of resources to support the holistic approach to safety management. The following are select tools to support benefit-cost analysis, which is a cornerstone of a data-driven holistic approach to roadway safety management.*

*Highway Safety Benefit-Cost Analysis Guide and Tool (FHWA-SA-18-001). This guide can assist transportation agencies in making consistent and sound investment decisions. The companion software tool is an Excel-based application that supports implementation of the methods described and demonstrated in the guide. The guide and tool will help users to quantify the costs and direct and indirect safety-related benefits of project alternatives. The tool is intended for project-level analysis of single or multiple improvements at a given location. It can also support network-level economic analysis for projects that include multiple locations (e.g., systemic improvements).*

*Crash Costs for Highway Safety Analysis (FHWA-SA-17-071). This guide describes the various sources of crash costs, current practices and crash costs used by States, and critical considerations when modifying and applying crash unit costs, and explores the feasibility of establishing national crash unit cost values.*

# TEXAS TRANSPORTATION COMMISSION APPROVES STATE'S 10-YEAR TRANSPORTATION PLAN

The Texas Transportation Commission approved TxDOT's 10-year transportation plan that includes more than $77 billion dedicated to improving safety, addressing congestion and connectivity, and preserving roadways for Texas drivers.

The 10-year plan, called the 2020 Unified Transportation Program (UTP), contains more than $4 billion for safety improvements, including an extra $600 million for the next two years to help accelerate even more safety measures in an effort to reduce crashes and eliminate fatalities from our roadways by 2050. Many of these improvements will widen roads; improve median barriers and bridges; upgrade guardrails; provide intersection improvements, such as upgraded traffic signals and signage; and make safety improvements for bicyclists and pedestrians.

More than $600 million committed to fund transportation improvements in the state's bustling Permian Basin energy sector is included in the plan to add to other funding in the energy sector. Projects focus on safety, connectivity, congestion relief, as well improving mobility at high-volume intersections. Funding also will pay for pavement strengthening for roadways with high truck volumes and weights.

"TxDOT is committed to reducing congestion and improving mobility and safety in Texas as evidenced by the agency's largest 10-year plan to date," said J. Bruce Bugg, Jr. Commission Chairman. "Additionally, we keep making progress in addressing congestion in our busiest parts of the state through our Texas Clear Lanes initiative, which addresses congestion in top chokepoints in our largest metro areas."

Many of the projects in this plan are roadway segments identified on Texas' 100 Most Congested Roadways list. The projects will be delivered with funding from legislative and voter-approved initiatives that allocate portions of oil and gas taxes, sales taxes and other money to the state highway fund.

Projects are selected based on how effective the projects are in addressing areas such as pavement condition, safety, capacity and rural connectivity. Projects are chosen collaboratively by TxDOT and local transportation leaders with ultimate approval by the Texas Transportation Commission with input from the public. The UTP authorizes highway projects for planning activities, development and construction. In addition to highway projects, the UTP address public transportation, maritime, aviation and rail.

# TRANSPORTATION PROFESSIONAL CERTIFICATION BOARD OFFERS NEW ROAD SAFETY PROFESSIONAL CERTIFICATION

The Transportation Professional Certification Board (TPCB), a certification body associated with the Institute of Transportation Engineers, introduced the Road Safety Professional (RSP) Level 1 Certification program in October 2018. Developed in collaboration with a wide array of transportation - and safety-related organizations in the United States and Canada, this certification is designed to support professionals in highway disciplines to establish their competency in providing for the safety of the traveling public.

Those achieving Level 1 certification will have demonstrated proficiency in the foundations of road safety principles. The exam is for a broad audience of professionals who in the performance of their work make decisions or take actions that potentially impact the safety of the traveling public. This includes those in the engineering, motor vehicle, behavioral, law enforcement, and emergency response communities.

In October 2019, the first RSP Level 2 certification exam was launched. This certification is geared toward professionals whose primary job functions are directed at improving the safety performance of the surface transportation system. It is for professionals responsible for developing and implementing engineering or behavioral programs aimed at reducing the number of fatalities and injuries due to road crashes. Prospective students will select between a Level 2 certification with a "behavioral specialty" or Level 2 certification with an "infrastructure specialty."

The Institute of Transportation Engineers is offering an RSP Level 1 Refresher Course, which is an overview of topics, key references, and independent study materials by topic for individuals in the transportation, safety, and public health professions who intend to take the RSP Level 1 certification exam. This course includes a suite of five (5) 90-minute, on-demand webinars on foundational elements of road safety, the collection and application of crash data and associated safety measures, human factors and their impact on roadway safety, safety management and the use of countermeasures, and the development and implementation of strategic safety plans. A different refresher course will be available for the Level 2 certification.

Computer-based exams for RSP, along with other professional certifications (Professional Traffic Operations Engineer® and Professional Transportation Planner®), may be taken at approved testing sites during the following upcoming timeframes:

- February 1 - 28, 2020 (Applications must be received by midnight, December 5, 2019.)
- June 1 - 30, 2020 (Applications must be received by midnight, April 2, 2020.)
- October 1 - 31, 2020 (Applications must be received by midnight, July 23, 2020.)

There are 38 test site cities in Texas. For a list of available test cities, please visit: https://www.scantron.com/test-site-cities/. For more information about this training or to submit an application, please visit the TPCB Road Safety Professional web page.

For more information on upcoming events and workshops, visit txltap.org

Call the TxLTAP office at 817-272-9678 or email us at txltap@uta.edu to schedule an event or workshop near you.

# TXLTAP EVENTS & WORKSHOPS

## GRAVEL ROADS ACADEMY

Improve upon current knowledge related to gravel road maintenance best practices. Learn how to get more mileage out of your gravel roads budget with the latest tools, techniques, and know-how from road maintenance experts.

## HEAVY EQUIPMENT FOR WILDFIRES

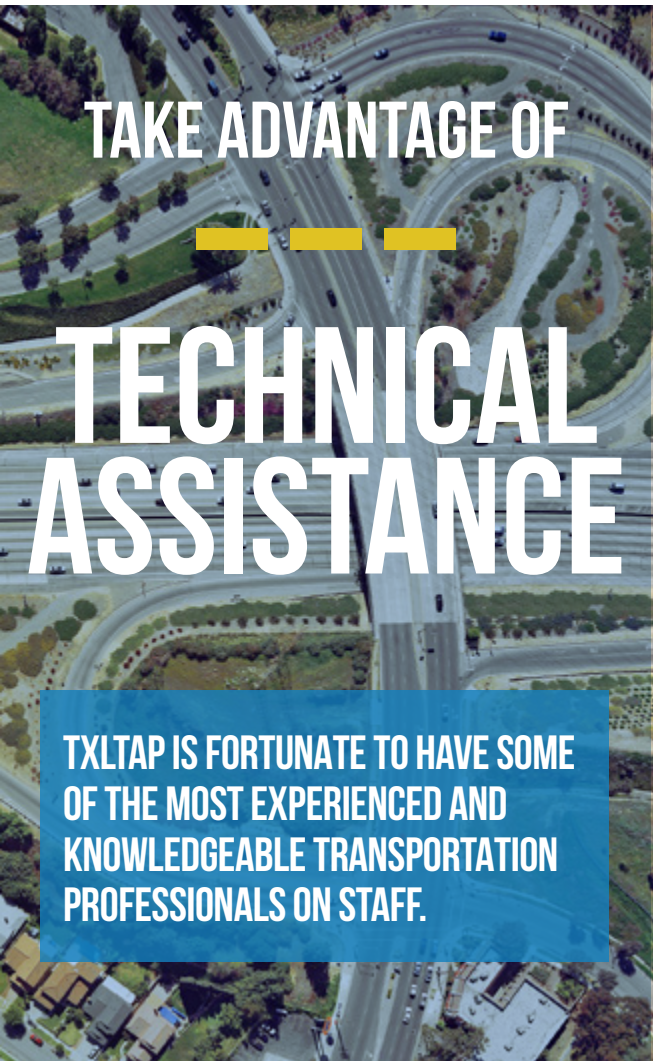
Heavy Equipment Operators are sometimes called out to assist fire fighters in wildland fire situations. Learn methods of attacking a fire, techniques of diminishing a fire with a dozer and grader, and dangerous situations to avoid.

## HEAVY EQUIPMENT RODEO

Heavy equipment operators will be given a chance to learn and practice new skills while stressing safety and excellence. Operators will use maintainers, backhoes, dump trucks, loaders, and more to steer through a series of exercises designed to test their abilities.

## SNOW AND ICE TECHNIQUES

Snow and ice control is a complex process. This workshop will cover personal and operational safety, plowing techniques, salt and abrasive application, and decision making based on the forecast and actual in storm conditions.



# TAKE ADVANTAGE OF TECHNICAL ASSISTANCE

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

This staff includes former 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 repairing 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 txltap@uta.edu. We're ready to help!

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140 W. Mitchell Street, Arlington, TX 76019

Texas Department of Transportation

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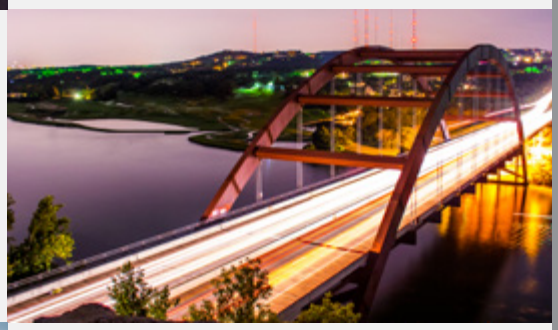
## SAFETY
Making Roads Safer for Workers & Drivers



## ORGANIZATIONAL EXCELLENCE
Striving for Overall Quality

## WORKFORCE DEVELOPMENT
Training that Makes an Impact

## INFRASTRUCTURE MANAGEMENT
Building Smart & Using Resources Effectively

## TRAINING.
## TECHNICAL ASSISTANCE.
## RESOURCES.

TxLTAP serves all local government roadway agencies by providing no charge training, technical assistance and resource access.

**Learn more at TxLTAP.org**

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