

MINNESOTA LTAP

TECHNOLOGY EXCHANGE

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Minnesota Local Technical Assistance Program

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Brush up on your defensive driving skills



Safety is a big part of snowplow operator training at agencies across the country, but this training typically does not cover defensive driving. A Clear Roads project fills this gap. The project added two new modules to Clear Roads' training materials for snowplow operators: defensive driving and safe driving.

Defensive driving continued on page 6

Converting some paved roads to gravel may lower costs, improve quality



A Guide to Successfully Convert Severely Distressed Paved Roads to Engineered Unpaved Roads

Across Minnesota, many local road agencies can't afford to maintain their distressed low-volume roads. Converting such roads to unpaved (gravel) roads, an approach used nationwide, can reduce costs and improve road quality, but information about the practice has not been widely available.

To meet this need, the Minnesota Local Road Research Board (LRRB) developed a comprehensive

information source on effective practices for converting severely distressed paved roads to acceptable engineered unpaved surfaces. The guide, targeted to Minnesota's specific needs, includes tools for decision making and communicating with the public. The project was recently named the LRRB's High Value Project of the year and won a 2020 AASHTO Sweet Sixteen Award. (The Sweet Sixteen are high-value projects selected by the four regions of AASHTO's Research Advisory Committee.)

The guide is based on a 2015 National Cooperative Highway Research Program (NCHRP) synthesis report: *Converting Paved Roads to Unpaved*. The synthesis identified states and agencies that

Unpaving continued on page 5



What do you think of Minnesota LTAP communications?

Do we send you the right amount of information?

Too often or not enough?

About the right topics?

Is our website helpful?

Please share your thoughts about our newsletters, training and event emails, and website by December 30. It should take about five minutes: z.umn.edu/LTAPsurvey ■

READ THE
EXCHANGE
online for links to publications
and other resources.



TECHNOLOGY EXCHANGE
Minnesota Local Technical Assistance Program
Center for Transportation Studies
University of Minnesota
University Office Plaza, Suite 440
2221 University Avenue SE
Minneapolis, MN 55414

PEOPLE

Roads Scholars across the generations

Frank Krahn and his grandson, Jed Rice, are at very different points in life. Krahn retired from a career as the Mayo Clinic's director of operational risk management in 2019 and is now deputy clerk for Bennington Township in Mower County. Rice graduated from high school in 2020 and is now working as a temporary employee for the Mower County public works department. Though separated by a generation, Krahn and Rice both decided to further their careers through Minnesota LTAP's Roads Scholar program. Both are currently working to earn their Maintenance Operations and Technical Certificate.

What made you decide to participate in the Roads Scholar program?

Krahn: When you retire, you need something else to do. I've always been a strong supporter of our local township government and helped out wherever is needed. And last spring they said, "You know, we could use somebody to check roads...and could somebody help do our signs?"

Rice: With Mower County, when I was little, I always wanted to work for them...I've always had the dream of heavy equipment operation and the dream of working for a construction company or even the county.

Krahn: [Jed] has been doing it since he was four. We owned our own Caterpillar and other equipment. He was always on grandpa's lap, learning how to make it operate.

What have you learned from the Roads Scholar program that surprised you?

Rice: The more I've been working [with Mower County], I've realized there's a lot more work that goes into all these projects than I thought. And then, taking the courses, it makes me realize that there

is a lot more thinking and processing of what the situations would be and the future that you have to predict.

What do you think other people could learn from your careers?

Krahn: I think what you try to teach is that you have to do things that service your community. How do you do that? You participate in local government, you take care of neighbors, you take care of family, but what you want to pass down to [the next generation] is this idea that, "We're the teachers, we're the inspiration for that next generation coming up."

Rice: I always try and better myself—get more knowledge and a better chance of achieving the goal that I want. When it gets difficult, I try my hardest not to give up on it and keep myself going to achieve the dream I want.

What are your plans for the future?

Krahn: I think when I held my retirement party, one of the secretaries, she said, "He's not retiring, he's just disappeared from here, but he can't sit still." I think for me it's always continuous learning and the opportunity to teach others.

Rice: I will continue with the Roads Scholar, for sure, so I can continue learning more that I didn't know before. And hopefully go forward with the county or even other construction companies if I have the opportunity. ■

—Sophia Koch, MnLTAP freelancer



Frank Krahn and Jed Rice



Welcome, Andrew Witter

Andrew Witter has joined the Minnesota LTAP Steering Committee. He is the public works director/county engineer for Sherburne County and represents the Minnesota County Engineers Association on our committee. Welcome, Andrew! ■

Knowledge guides preserve expertise of retiring workers



Gordon Bruhn

Three new learning guides from MnDOT preserve the wisdom of experienced retiring engineers. The multimedia guides combine graphics, video, and written material about concrete pavements, asphalt

pavements, and steel bridges in interactive formats posted for internal and public use on MnDOT websites.

One current and two retired MnDOT engineers—Gordon Bruhn, David Linell, and Todd Niemann—were interviewed for the three knowledge guides. Interview results were compiled into slide presentations with video segments and relevant documents that users can view in any order. The content from two of the slide presentations was reformatted into electronic-learning books that can be accessed with desktops, tablet computers, and other mobile devices.

The *Concrete Pavement Rehabilitation Knowledge Book* is currently being used by MnDOT materials engineers and is available on request as a slide presentation. *The Bituminous Knowledge Book* was made available online in April 2020. The *Structural Steel Bridge Construction Knowledge Book* will be available online as an e-book in 2021.

Project champions expect that the knowledge

guides will prove particularly valuable to newer employees after key topical experts retire. ■

Learn more:

- Go to researchprojects.dot.state.mn.us and search for "Knowledge Retention Pilot Project" (2020)

By 2023,
31 PERCENT
of MnDOT's workforce
will be eligible
TO RETIRE.

Technology Exchange

The Minnesota Local Technical Assistance Program is part of the Federal Highway Administration's Local Technical Assistance Program (LTAP). LTAP is a nationwide effort designed to foster and improve information exchange among local practitioners and state and national transportation agencies. Minnesota LTAP is administered by the Center for Transportation Studies at the University of Minnesota, and cosponsored by the Minnesota Local Road Research Board and the Minnesota Department of Transportation.

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Technology Exchange welcomes contributions and suggestions from its readers. Submit ideas and other comments to Pamela Snopl, managing editor.

Minnesota LTAP

Center for Transportation Studies
University of Minnesota
University Office Plaza, Suite 440
2221 University Avenue SE
Minneapolis, MN 55414
Phone: 612-626-1077
Email: mnltap@umn.edu
Web: mnltap.umn.edu

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Minnesota LTAP Staff

LTAP Director: Stephanie Malinoff
LTAP Program Director: Mindy Carlson
LTAP Program Coordinator: Katherine Stanley
CTAP Instructor: Kathy Schaefer
Managing Editor: Pamela Snopl
Editors: Christine Anderson, Michael McCarthy
Designer: Angela Kronebusch

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Andrew Witter, Sherburne County; Minnesota County Engineers Association



Preparing the workforce of the future

Technology and societal needs in the transportation sector are changing fast, and with them the skills transportation workers will need to do their jobs.

Autonomous and flying vehicles, changing demographics, rapid urbanization, and concerns about resource consumption are all factors that are drastically changing the landscape for transportation workers. Developing the right skills to meet these changing demands is highly important yet challenging when it comes to ensuring the skills developed keep pace with technological advances. Traditional methods of training or retraining workers may need a reset to accommodate this accelerated pace.

To address these challenges, Trinetta Ballard and Victoria Peters from the Federal Highway Administration shared thoughts at the virtual NLTAPA/NTTD Annual Conference on how to move the existing workforce ahead of the curve. Following a range of discussion questions, attendees identified some key concerns for the future and potential strategies that might address them:

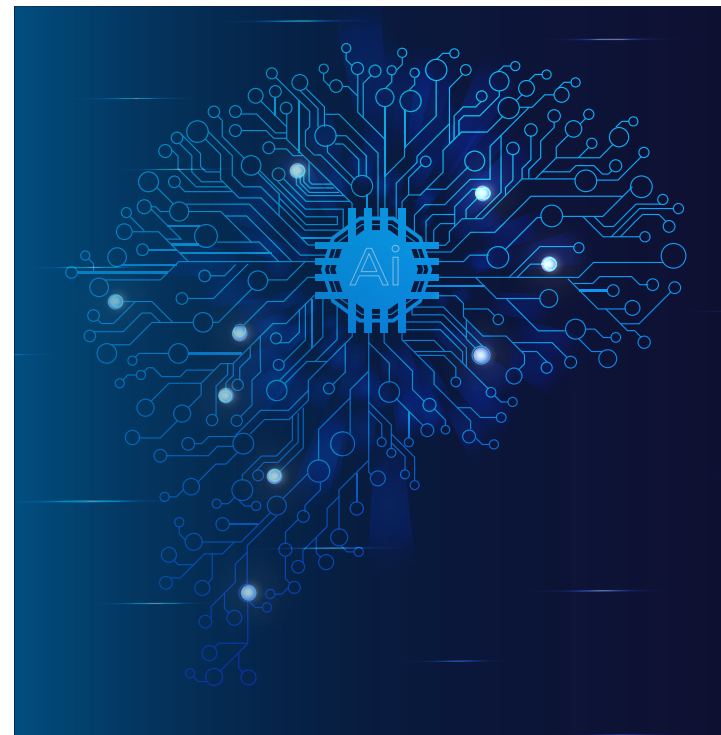
- **Artificial intelligence** will likely have a major impact on the industry. It has the potential to expand data collection, automate certain tasks, and provide an interlinked, communicating grid of vehicles and infrastructure. It also poses unique security and privacy risks. As a result, a certain level of comfort and skill around technology will likely be required of workers in the future.
- **Flexibility and diversity** are becoming increasingly necessary as the needs of the industry change with ever-increasing speed. Short-term, one- to two-year schooling programs may become more common compared to four- to five-year programs. On-the-job training,

retraining, and job shadowing will likely become key to ensuring that workers can continually update their skill sets.

- **Second careers** are showing signs of becoming the new employment norm in the transportation sector. In the near future, transportation workers may no longer stay in one job or career for 30 years. This has its advantages, in that it allows young workers to develop diverse skill sets and better find careers that fit their strengths. However, it also comes with challenges; workers must be able to learn new skills quickly. Skills that are readily transfer (such as soft skills) and on-the-job training may become critical for this new employment format.

“This was really about looking into the future,” Peters concluded. “A decade forward is not that far away, so we need to really start thinking about what we can do today, what we can do five years from now, to prepare for that 10- to 15-year horizon.” ■

—Sophia Koch, MnLTAP freelancer



NLTAPA/NTTD annual conference

Transportation professionals from all over the country gathered virtually on July 28–30 for the 31st annual National Local Technical Assistance Program Association (NLTAPA) conference. This also was the second year that NLTAPA partnered with the National Transportation Training Directors (NTTD) for the event. Presenters shared widely applicable information about leadership, building community, better communication, and training strategies; others presented industry-specific tools and resources. Audience members interacted and asked questions throughout the event. We share three summary articles: two on this page and one on page 6. ■

Tips for conflict management: The STOP method



Running into conflict is an inevitability, no matter the workplace. Emily Wilder, associate director of business operations at the University of Kansas Transportation Center, gave an interactive presentation at the virtual NLTAPA/NTTD Annual Conference that taught participants how to manage conflict in the workplace—or indeed, anywhere.

Wilder posits that the foundation to successful

conflict management is being able to effectively manage yourself. Quick reactions when tensions are high tend to have negative consequences. Wilder designed the “STOP method” to encourage people to slow down and carefully consider a situation before acting. Like a STOP sign, the STOP method reminds us to pause, assess what’s happening, and proceed thoughtfully.

- **Sensing:** Becoming more fully aware of yourself on a physical, emotional, and value-based level is key in managing conflict. How are you physically reacting to the situation? What emotions are driving that reaction, and what underlying values feed those emotions? The only person you can control during conflict is yourself, so fully understanding yourself is key to managing a tense situation.
- **Take the time:** Quick reactions are tempting but prone to negative results. Depending on the circumstances, it may be smart to take a few deep breaths, a couple extra minutes, or

even days to think over the situation.

- **Observations and perceptions:** Observations are definite, observable truths. Perceptions are the conclusions and meanings people draw from observations. “Playing Sherlock Holmes,” Wilder says, is a dangerous game—we are less good at it than we think, and our perceptions are often colored by our own experiences. Learning to separate observations from perceptions is important, as it helps us identify the true root of problems and address them as they are.

“You don’t stay at a stop sign forever,” Wilder says, and eventually a person must move past the STOP method and make either a request or an offer. If they’ve done their part well and have taken the time to fully consider the driving forces behind the conflict, the request or offer can move the conversation forward and help resolve the conflict. ■

—Sophia Koch, MnLTAP freelancer

Strategic workforce development: Roads to Your Future

The demand for highway construction, maintenance, and operations workers is growing while the industry is experiencing a revolution of emerging technologies that will require new skills. To attract and retain workers in the contracting workforce, new resources are available to help compete with other industries and demonstrate the value of a career in transportation.

One such resource is a highway construction workforce development playbook from the Federal Highway Administration (FHWA) called *Identify, Train, Place*. The playbook is aimed at helping state and local agencies identify, train, and place workers in the contracting workforce to meet resource needs to deliver highway construction jobs. The playbook condenses the lessons learned from a pilot project

into simple, repeatable “plays” that others can use.

In addition to the playbook, FHWA developed a comprehensive outreach campaign called *Roads To Your Future*. The campaign includes free messaging and marketing materials to help recruit the next generation of highway construction workers. Many of the materials can be customized with local information to market open jobs and training to potential applicants.

Increasing the contracting construction workforce can help communities thrive. It also offers an opportunity to recruit minorities and women to jobs that can change their lives, and the lives of their families, for the better.

See [fhwa.dot.gov/innovativeprograms/centers/workforce_dev/hcwp](https://www.fhwa.dot.gov/innovativeprograms/centers/workforce_dev/hcwp). ■



INNOVATIONS

Serrated sander auger breaks up salt chunks

Below is an innovation from MnDOT's Maintenance Operations Research (MOR) program. For more from MOR, see dot.state.mn.us/maintenance/research.html.

Project description

District 8 was interested in trying out a modification of an existing Fall's sander auger with a serrated flighting to help break up salt chunks that would otherwise not be able to fall through the auger.

Purpose

Address the problem of not being able to apply chemical if the auger is plugged with salt chunks.

Test procedure

The district installed two serrated sander augers: one each in the Granite Falls Truck Station and Marshall Truck Station. They evaluated their effectiveness versus the current practice of having to break up chunks by hand or unload then reload the truck.

Conclusions

From the operators' accounts, the auger broke up any chunks that it caught. This allowed for the salt to continue to be fed to the auger so it could get spread out on the road. Some of the chunks came out of the auger around tennis ball size, but it allowed the operator to keep applying chemical and not have to stop and break up chunks by hand or return to the truck station to unload and reload the truck.

Contact

Ryan Eliason

Agency

MnDOT D8/Marshall

Phone

320-979-6371

Project cost

\$9,709

Completion date

June 2020

Vendor

fallsplows.com

Recommendation for implementation

The district feels that this product could help statewide with any trucks/shops that have issues with salt chunks while loaded in the truck. As long as the salt chunks can fall down to the auger, it seems to break them up and allow salt to be spread on the roadway. District staff are hopeful that in the future this auger would be a choice on the spreadsheet for when new plow trucks get ordered. ■



National Mousetrap: Spreader guard and signal scraper

Below are two innovations honored in the National LTAP Build a Better Mousetrap competition.

Steel guard keeps spreader out of harm's way

When hitched to the back of a utility vehicle, Swatara Township's tailgate salt spreader seemed like nearly the perfect tool to distribute ice melt throughout the community. Tight spaces near sidewalks and walkways, however, often accidentally damaged the unit. One bumped or scraped spinner could cost \$400 to replace; more extensive damage could require replacing the entire spreader, doubling the expense.

To protect the Pennsylvania township's investment, employees designed and built a guard that bolts to the tow hitch on the utility vehicle. The guard was fabricated by welding together scrap rolled steel. The cost was only \$200, including labor, and the guard shields the spreader from accidental damage. With this simple solution, the township continues to serve the community during winter weather without interruption and potentially saves hundreds of dollars each year in spreader

replacements.

Contact: Todd Webb, highway superintendent, 717-564-2551, twebb@swataratwp.com

LED signal scraper provides bright way to remove snow and ice

Each winter, the City of Papillion (Nebraska) Public Works encounters heavy, wet snow that sticks to LED traffic signals during storms. The snow blocks out the signal because, unlike older incandescent versions, LED lights do not produce enough heat to melt snow. Public Works wanted to find a way to remove this snow and ice without forcing road crews to spend long periods of time in harsh winter weather.

Staff mated an ice scraper to a paint roller and mounted both atop an adjustable extension pole. This allowed crews to reach the tool into a hooded light to clear the lens, either from the ground or from inside a pick-up cab. Completing the entire project in-house using basic hand tools cost only \$50 per scraper. Armed with this low-cost solution, Papillion crews effectively cleared traffic signals throughout the winter, ensuring signal visibility for the driving public while also exposing crews to less snow, ice, and cold during their workday.

Contact: Jeff Thompsen, director/city engineer, 402-597-2043, jefft@papillion.org ■



Salt spreader guard



LED signal scraper

Submit your ideas for the 2021 Mousetrap competition!

As you work on projects throughout the year, please keep Minnesota's 2021 contest in mind. We want to hear about your agency's creative solutions, and submissions are welcome at any time. To enter, just submit an entry form by May 15, 2021. You're also encouraged (but not required) to submit photos and short video clips showcasing your project along with your entry form. For more information, please contact Katherine Stanley at sell0146@umn.edu or 612-626-1023, or visit mnltpap.umn.edu/mousetrap. ■



Connect with the LRRB on LinkedIn!

Follow the Minnesota Local Road Research Board for updates on research projects and new resources and to connect with other local transportation practitioners: [LinkedIn.com/company/lrrb](https://www.linkedin.com/company/lrrb). ■

OPERA project: Sand-stabilized dirt roads

Kittson County has many miles of dirt roads serving its extensive cropland. But high levels of soil salinity create a naturally weak subgrade, so these roads tend to become impassible with severe rutting after a summer rain or when exposed to heavy loads from trucks hauling crops and supplies.

The Kittson County Highway Department received a \$15,000 grant through the Local OPERA Program to develop a low-cost way to strengthen these dirt roads or at least make them more accessible by adding sandy aggregate (Class 3) with the dirt. An area railroad provided excess piles of this sandy aggregate for the project.

Project Leader
Lynnette Steyn

Agency
Kittson County
Highway Dept.

Phone
218-843-2686



Excess sandy aggregate provides basis for comparison

The Kittson County project began in mid-June and ran through mid-August 2019. First, highway department staff selected two miles of township dirt road, which had been bladed and packed with a pneumatic roller, then test-rolled with a loaded truck before adding material to measure the deflection for a subsequent comparison.

When mixing aggregate with the top inch of the dirt road didn't work, staff adjusted by placing the aggregate material on top of the road. They created an evenly distributed 1.5-inch layer over the first mile and a 2.0-inch layer over the second mile. Still, after a few weeks and some heavy agricultural loads, the surface became rutted.

Roads with added sand hold up better to heavy loads over time

To keep costs to a minimum, Kittson County staff did not apply water—usually used to consolidate the mixture—but staff continued to monitor the road segment after rainfall events and used a motor grader to maintain the road throughout the summer. With more traffic and rainfall events, the materials became more consolidated and held up better to heavy loads as time went on.

A test-rolling in July showed an improvement of 1 inch less rutting (a 38 percent decrease) over the first mile and an improvement of nearly an inch less rutting (a 30 percent decrease) for the second mile. A second test-rolling in August showed a 42 percent decrease in rutting along the first mile and a 41 percent decrease for the second mile.

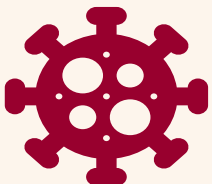
Local farmers in the research project area had expressed skepticism about the project. But, after the sandy aggregate consolidated with the dirt over time, the farmers felt that the road did perform better for the heavy wheat harvest loads in August.

Plans fell through for a final test-rolling on the road after harvest season due to record rainfall in September and October. In fact, the extremely wet conditions did not allow travel on dirt roads and made the 2019 harvest season very difficult to complete.

Nonetheless, the team concluded that the project produced a significant reduction in rutting by applying sand (Class 3) to the dirt road. In addition, the segment with less added aggregate showed a greater reduction in rutting than the other segment. The team theorized that the subgrade of the first segment could have been stronger and more stable or that the sand may have consolidated better with the dirt.

The Kittson County Highway Department project team feels that their findings will benefit other local agencies, townships, and even private landowners with access to low-cost material and a goal to improve local dirt roads. ■

[GO TO MNLTA.UMN.EDU/OPERA TO WATCH A VIDEO ABOUT THE PROJECT.](https://mnlta.umn.edu/opera)



Send us your OPERA ideas: Tools, processes, or tips for COVID-19

Do you have ideas for improving tools or processes? Or maybe you've been finding solutions for COVID-related impacts to your job that could benefit other agencies? If so, please send your ideas to the LRRB's Local Operational Research Assistance (OPERA) Program. There is no deadline to submit your proposal, but funding is limited. Please see the OPERA web page for details: mnlta.umn.edu/opera. ■

Unpaving from page 1

have conducted road conversions; the relevant tools, metrics, and procedures involved in the process; and related concerns and needs.

For the LRRB guide, a research team selected and transformed the extensive information presented in the 2015 study into a shorter scope and more visual format that would be comprehensive, succinct, and accessible. The guide includes:

- Methods to determine **if a road is a candidate** for conversion, including how to determine an existing road's materials and condition.
- Methods to **convert a road** from paved to unpaved, including design, construction, maintenance, performance-based materials specification, chemical stabilization, and dust control.
- **Life-cycle cost analysis** tools that compare the life-cycle costs of unpaving versus maintaining the road in its current condition or rehabilitating the road to its original condition.
- Tools to inform and **communicate with the public** effectively, since most people who will be affected by a road conversion project will not immediately expect or want a gravel road as a maintenance solution. Early and effective communication is essential for road user understanding and acceptance of the process.

- **Safety implications** of unpaving.

"Many local engineers have reached the same low point in considering their severely distressed low-volume roads," says Tim Stahl, county engineer for Jackson County. "They can now find in this guide a consistent and innovative approach for distressed road management in Minnesota and surrounding states."

The LRRB project page has the final guide and video—both titled *Converting Severely Distressed Low-Volume Paved Roads to Engineered Unpaved Roads*—as well as a webinar and other materials. ■

Roads with AADT less than
100 – 150
VEHICLES PER DAY
are good candidates for.
UNPAVING.



SAFETY

An 'alphabet soup' of digital traffic safety resources from FHWA

Engaging the public and exchanging information among researchers, officials, and field professionals are major priorities in the transportation sector. Doing so, however, has been made especially challenging by the COVID-19 pandemic, which prevents the use of in-person outreach methods such as trade shows and conferences.

To address these needs and unusual challenges, Hillary Isebrands and Tori Brinkly from the Federal Highway Administration Safety and Design Technical Service Team presented new options at the virtual NLTAPA/NTTD Annual Conference. Their presentation outlined some of the resources the FHWA has developed for engaging the public and provided links that transportation professionals might use to exchange ideas or promote safety.

Pedestrian safety virtual booth

With in-person trade shows no longer an option, the FHWA decided to develop a virtual booth—a website and a downloadable PDF. The PDF can be shown at various meetings and conferences, and vendors can use it as an opportunity to share their latest innovations and digital publications. safety.fhwa.dot.gov/pedestrian_safety_virtual_booth

Local road safety plan do-it-yourself site

The FHWA designed the DIY site to house a variety of guidebooks, training manuals, webinars, and other resources that transportation professionals can use to share and develop safety plans for local roads. safety.fhwa.dot.gov/LRSPDIY

Safe Transportation for Every Pedestrian (STEP)

This program was formed in response to data from the National Highway Traffic Safety Administration (NHTSA) showing intersections to be a high-risk envi-



ronment for pedestrians. The STEP program provides a variety of resources—from informative podcasts to action plan frameworks—that traffic professionals can use to develop safer intersections. safety.fhwa.dot.gov/ped_bike/step/resources

Focus on Reducing Rural Roadway Departures (FoRRRwD)

Lane-departure crashes on the rural road network account for one-third of traffic fatalities, according to data from NHTSA. The FoRRRwD program offers

resources for transportation professionals to utilize when working to address this danger. safety.fhwa.dot.gov/forrrwd/countermeasures.cfm

Road safety audits

These are an effective tool for proactively improving road safety during the design and planning stages and for identifying safety issues in existing transportation facilities. safety.fhwa.dot.gov/rsa ■

—Sophia Koch, MnLTAP freelancer

Video series: Road safety audits

The National Center for Rural Road Safety has created a series of videos on road safety audits. The series has three parts: an introduction, what they are and how to get started, and an overview of the eight-step process. To view them, go to the multimedia page at ruralsafetycenter.org. ■

Defensive driving from page 1

Agencies can customize and integrate the two modular, instructor-led training courses into their operator training programs. Both courses include presentation slides with instructor notes, an instructor's guide, and post-training assessments. Video animations allow instructors to step through hazardous scenarios, identify decision points, and discuss strategies to avoid crashes.

"Our state will start defensive driving training this winter; if we prevent one crash a year, the savings will pay for our training efforts," says project champion Douglas McBroom of the Montana DOT.

Clear Roads is a national research consortium with 36 member agencies; MnDOT is the lead agency.

Defensive driving training

The defensive driving training module is a first-of-its-kind compilation of approaches that plow operators can take to anticipate and prevent crashes caused by another vehicle. Sample strategies include:

- **Make safe left turns:** Signal well in advance, since turn signals may be obscured by snow or blend in with other warning lights. Keep mirrors clear and check them before turning.
- **Minimize the snow cloud:** Reducing speed may help make the snow cloud around the plow smaller. If the surrounding traffic is obscured by the cloud, take care in changing lanes.
- **Wing plow strikes:** Use the wing plow on shoulders, not to plow the active driving lanes (unless plowing in team formation). If possible, raise the wing if another vehicle is about to strike it.

Safe driving training

The safe driving training module provides a thorough review of strategies for navigating the roadway and avoiding obstacles, especially when visibility is limited. Sample strategies include:

- **Identify hazards:** In dry weather, scan the route for potential hazards. Document known hazards in a GIS database or other shared file. If possible, mark hazards such as soft shoulders with delineator posts.
- **Practice safe backing:** When backing is unavoidable, use a spotter, or get out and look all around the truck. Open garage doors and look for hidden objects.
- **Manage fatigue:** Maintain a regular sleep schedule when possible. Learn to self-assess fatigue. Take breaks every two hours; get out at each turnaround and when refilling material.



By learning and using defensive driving strategies, operators may be able to help prevent more types of crashes—ultimately keeping highways safer and saving agencies money.

The two modules are available for any agency to download for free on the Clear Roads website: clearroads.org. ■

TOP FIVE MOST COMMON PREVENTABLE SNOWPLOW CRASH TYPES:

- Fixed-object strikes
- Run-off-the-road crashes
- Backing crashes
- Wing-plow crashes
- Rear-enders by another vehicle

THE SHELF

Minnesota LTAP partners with the MnDOT Library to operate a state-of-the-art service that can help you track down almost any resource from Minnesota or beyond. Questions? Contact Marilee Tuite, Minnesota LTAP librarian, 612-626-8753, ctslib@umn.edu.

Development of a Life-Cycle Cost Analysis Tool for Improved Maintenance and Management of Bridges (Iowa DOT, June 2020)

Develops a life-cycle cost analysis tool for Iowa's bridges based on survival analysis of condition ratings.

City Limits: Setting Safe Speed Limits on Urban Streets (NACTO, July 2020)

Offers three tools for setting speed limits on urban streets.

How Do Complete Streets Matter for Communities? The Case of Richfield, Minnesota (MnDOT, July 2020)

Illustrates Richfield's innovative approach to transforming its transportation infrastructure and provides a roadmap for future analyses of the impacts.

Inlaid Pavement Marker Evaluation (Missouri DOT, July 2020)

Assesses inlaid pavement marker (IPM) performance and finds that when installed with pavement resurfacing, IPMs significantly reduce all crash types examined.

Techno-Economic Analysis of Implementing Hybrid Electric Utility Vehicles in Municipal Fleets (MnDOT, July 2020)

Recommends that fleets consider driving cycle as the primary factor for determining the economic benefits of purchasing alternative powertrain vehicles.

Evaluation of the Effectiveness of Stop Lines in Increasing the Safety of Stop-

Controlled Intersections (MnDOT, July 2020)

Describes a safety study and an observational study to explore how stop lines impact intersection safety.

Examination of Features Correlated with Roadway Departure Crashes on Rural Roads (Virginia DOT, August 2020)

Analyzes the characteristics of roadway departure (RD) crashes on rural roadways and identifies how the variation in RD crash frequency and severity is related to roadway, roadside, and traffic features.

Calibration of HSM Predictive Methods on State and Local Rural Highways (Mountain-Plains Consortium, August 2020)

Recommends using a hybrid method with both *Highway Safety Manual* (HSM) and state-specific models for certain segment and intersection types to achieve high crash prediction accuracy.

City Planner Survey Reveals the Most Common Tools for Promoting Transit-Oriented Development (National Center for Sustainable Transportation, August 2020)

Presents results from a survey of 150 city planning directors in California's four largest metropolitan areas to better understand cities' motivations and challenges regarding transit-oriented development.

Reducing Uncertainties in Snow Fence Design: Development of Methods for Estimation of Snow Drifting and the Snow Relocation Coefficient (Iowa DOT, September 2020)

Addresses seasonal snow relocation coef-

ficient and seasonal storage capacity related to snow fence design.

Effects of Tree Canopy on Pavement Condition, Safety and Maintenance - Phase 2 (Ohio DOT, September 2020)

Shows that tree canopies substantially reduce thermal loading, snow accumulation, and moisture in light to moderate rainstorms.

A Micro-Scale Analysis of Cycling Demand, Safety, and Network Quality (Mineta Transportation Institute, September 2020)

Shows that local government mobility planners should consider cycling networks in their long-range plans and short-range implementation efforts.

Beam End Repair for Prestressed Concrete Beams (Iowa DOT, September 2020)

Recommends the most effective repair methods and appropriate retrofit materials for rehabilitating prestressed concrete beam ends. ■

Best practices guide: Managing utility congestion in rights-of-way

The LRRB developed a succinct and accessible best-practices guide for managing utilities within public rights-of-way (ROW). The guide will help communities, agencies, and infrastructure utilities better manage the planning, installation, and accurate mapping of under- and aboveground utility services. It includes essential information about Minnesota statutes and administrative rules as well as Federal Communications Commission rules. ■

Search me

The Minnesota LTAP website features custom search engines to help you find information. You can search:

- LTAP & TTAP Centers
- State DOTs
- Transit agencies
- University transportation centers

Bookmark mnltp.umn.edu/publications/library.

Other great resources are:

- LRRB's site: lrrb.org
- MnDOT Library's catalog: dot.state.mn.us/library ■

More from Clear Roads

Alternative Methods for Deicing

With case studies and recommendations, this report is a reference guide for winter maintenance operators and managers. It includes resources and contact information to allow for direct follow-up.

Mechanic/Operator Training and Training Needs for Winter Maintenance Equipment

This synthesis identifies the best practices agencies use to deal with breakdown of winter road maintenance equipment in the field, the types of experience sought by agencies in their operators and mechanics, and the maintenance and repair areas where operators and mechanics would benefit from additional focused training.

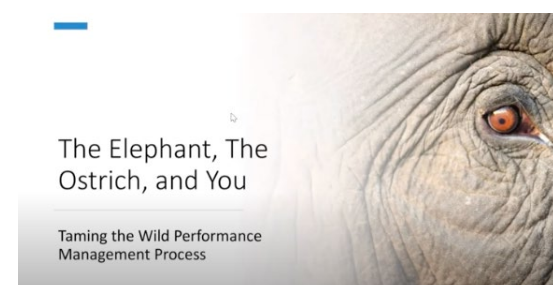
Weather Event Reconstruction and Analysis Tool

This web-based tool allows transportation agencies to reconstruct winter weather events more quickly and easily. It is particularly beneficial for smaller agencies and for those with limited staff resources. ■

Performance management: 'The Elephant, the Ostrich, and You'

This new training video from the University of New Hampshire Technology Transfer Center is intended for public works leaders or supervisors.

Employee appraisals, evaluations, or feedback—whatever you call it, if it feels like there's an elephant in the room or an ostrich with its head in the sand, the process might be broken. This video revisits the principles and best practices for ongoing, genuine, and meaningful employee feedback and performance coaching for your employees, your team, and your organization. ■



The Elephant, The Ostrich, and You

Taming the Wild Performance Management Process

EDC-6 features seven proven innovations

Strategic workforce development is one of seven innovations that will be promoted in the sixth round of Every Day Counts (EDC-6), the state-based program to rapidly deploy processes and technologies to boost the safety and efficiency of the transportation system and keep America moving. The other six are innovations are:

- Crowdsourcing for advancing operations
- e-ticketing and digital as-builts
- Next-generation traffic incident management: Integrating technology, data, and training
- Targeted overlay pavement solutions

- Ultra-high-performance concrete for bridge preservation and repair
- Virtual public involvement

FHWA will promote these proven, market-ready innovations in 2021 and 2022. Starting in January, EDC-6 deployment teams will provide technical assistance and training to help transportation agencies implement the innovations selected by their states. Go to the EDC-6 innovations web page for information, resources, and contacts. ■



Every Day Counts is the FHWA's initiative to advance a culture of innovation in the transportation community in partnership with public and private stakeholders.

TRAINING

Online training

To help slow the spread of COVID-19, Minnesota LTAP has suspended all in-person activities until further notice. In the meantime, we invite you to participate in online training, webinars, and virtual events. Please see our calendar for a variety of options from MnLTAP and other agencies to meet your training needs during this time.

MnLTAP online courses

Culvert Design and Maintenance – \$45
(1 RS Maintenance credit) *LTAP*

Sign Maintenance and Management for Local Agencies – \$45
(1 RS Maintenance credit) *LTAP*

Gravel Road Maintenance and Design – \$45
(1 RS Maintenance credit) *LTAP*

Work-Zone Safety Tutorial – Free
(0.5 RS Maintenance credit) *LTAP*

Fundamentals of Construction Inspection – Free
(1 RS Maintenance credit) *LTAP*

Other online courses eligible for RS credit

Maintenance Stormwater – Free
(0.5 RS Maintenance credit)

Math Basics for Maintenance Technicians
(1 RS Maintenance credit) – Free

Administration and Management Basics
(1 RS Leadership credit) – Free

Installation and Management of Roadside Turfgrasses – \$175
(1 RS Maintenance credit)

MnLTAP webinars

Periodically, Minnesota LTAP offers live webinars on maintenance topics. Recordings are archived for later viewing.

Snow and Ice Control Material Application (CTAP) – Free
(0.5 RS Maintenance credit) *LTAP*

Tips to Improve Your Public Speaking – Free *LTAP*

Gravel Roads Webinar Series (4-part series) – Free
(0.25 RS Maintenance credit per webinar) *LTAP*

MnLTAP training videos

These include recordings from some of our in-person and virtual workshops as well as special presentations recorded by our instructors.

Current Practices for Lightly Surfaced Roads – Free *LTAP*

Minnesota Truck-Weight Education Program: Special Products Presentation – Free

ADA Training (3-part series) – Free

LTAP training

LTAP training is marked above with an *LTAP*. Check the web for details and to register: mnltp.umn.edu. To be added to our mailing list, email mnltp@umn.edu or call 612-625-1813.

Roads Scholar Program

You can earn credits in Minnesota LTAP's two Roads Scholar (RS) certificate programs by completing LTAP and other cosponsored training. One certificate is focused on maintenance operations and the other on leadership and supervision. To learn more or enroll in the program, visit mnltp.umn.edu/roadsscholar. ■

New virtual workshop on Jan. 26: Writing that Works!

This MnLTAP workshop provides an introduction to the importance of writing and the professional skills needed for public works professionals. The workshop emphasizes planning, preparing, and delivering effective and clear workplace documents to communicate with the general public and elected officials. It will be held virtually on January 26 from 9:00 a.m. to 3:30 p.m. Cost is \$45. (1 RS Leadership or 1 RS Maintenance credit) ■

More virtual training added to MnLTAP website

Maintenance Stormwater

This free course is now available for credit in MnLTAP's Roads Scholar program. The course is intended for maintenance staff and those involved in the implementation of common best management practices. It's offered by AASHTO via the TC3 course management system.

Fundamentals of Construction Inspection

This free course is adapted from Minnesota LTAP's spring in-person workshops. The course, sponsored by the LRRB, introduces new inspectors to the components and considerations for success.

Lightly Surfaced Roads

This free training video reviews current practices for lightly surfaced roads and shows how to select the right treatment and successfully apply it. The video is a recording of a June 10 workshop presented in partnership with the LRRB, SRF Consulting Group, Braun Intertec, and Minnesota LTAP. ■

New! Culvert Design for Stream Connectivity virtual workshop

This free virtual workshop will help culvert designers efficiently and consistently develop public waters culvert projects that take into account aquatic organism passage and stream connectivity.

The MnDOT-sponsored workshop will begin with a self-paced learning component, available to participants for two weeks, followed by an instructor-led interactive online session. The self-paced learning will feature a series of short video presentations totaling approximately four hours, including virtual field data collection. The instructor-led session will provide an opportunity for discussion, questions, and review of work completed in the self-paced training.

Five sessions of the workshop will be offered between now and June; each session includes identical content. Limited spots are available in each session, so register early to secure your preferred dates. ■

APWA launches PWX@Home training

The American Public Works Association (APWA) launched a new training series in August—PWX@Home. It will feature more than a hundred online education sessions, exhibits, and networking opportunities.

PWX@Home sessions will be held on the second Tuesday of each month through July 2021. Recordings will be available for purchase in the APWA Store, and many helpful resources are free online. Learn more about APWA e-learning at apwa.net. ■

Other online training resources:

- National LTAP Tailgate Talks
- AASHTO's TC3 Library
- APWA eLearning webinars and courses
- and much more!

Defensive driving: Test your knowledge

The new defensive driving module from Clear Roads (see article on page 1) has several quizzes. Here's one of them. The answer is on page 7.

How often are you supposed to look in your mirrors?

- Every 15–20 seconds
- Every 30 seconds
- Every 8–10 seconds
- Every minute

