

# MINNESOTA LTAP TECHNOLOGY EXCHANGE

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Minnesota Local Technical Assistance Program

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## Public works, emergency response agencies team up to manage traffic incidents



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From a local street repair to a major crash, any event—planned or not—that takes place on a roadway is considered a traffic incident. Incidents that happen on major highways during crowded rush hour commutes generally get more attention, but principles that apply to major events also apply to incidents on local streets. Effective traffic incident management *continued on page 2*

## Younger drivers toolkit provides resources for local agencies

Younger drivers between the ages of 15–29 are Minnesota’s highest-risk driving population. Traffic crashes involving this age group resulted in 32 percent of traffic fatalities and 40 percent of traffic injuries in the state in 2013. To help local agencies reduce these tragic numbers, the Minnesota Department of Transportation recently released the *Younger Drivers Toolkit for Local Agencies*.

The toolkit, funded by the Minnesota Local Road Research Board (LRRB), is designed to help city and county transportation and traffic safety engineering staff understand the “why” behind younger driver severe crashes and provide ideas and resources to help educate and promote community engagement.

The toolkit first provides a foundation for understanding the role of driver behavior in traffic crashes and younger drivers’ attitudes and motivations for



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high-risk driving. According to the toolkit, driver behavior is the most significant contributor to serious crashes on local roads, causing nearly 93 percent of crashes. Driver behavior factors refer *Younger drivers continued on page 3*

## Prevent workplace backing accidents

Maintenance garages, equipment yards, and road work zones can be dangerous places. Heavy equipment operates close to workers on foot in areas busy with activity and noise. Unsafe backing maneuvers in these environments can increase the risk of death or injury and cost many thousands of dollars for repair and replacement of damaged equipment.

“Going in reverse is not a natural maneuver because the blind spots, especially on larger vehicles, can be huge,” says Ben Rank, a loss control specialist with Cities and Villages Mutual Insurance Company in Wisconsin. “But sometimes there is no alternative but to back a vehicle.”

Rank says that street and highway departments can prevent workplace backing accidents by following best practices and raising awareness through good training. He emphasizes three key principles for safe backing and offers additional tips.

*Backing continued on page 6*



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TECHNOLOGY EXCHANGE



# SAFETY

Incident management *from page 1*

agement (TIM) is crucial to mitigating the impacts of incidents and improving the safety of the traveling public and emergency responders alike. In a session at the American Public Works Association–Minnesota Chapter annual fall workshop, John McClellan and Mark Ray discussed a variety of strategies and tools public works departments can use to decrease their response times and increase their effectiveness in managing their own work zones and assisting other first responders.

## Manage the scene

Overall, emergency responders must be able to focus on assisting people in distress while making sure any traffic around the incident scene is managed, explained Ray, the public works director of the City of Crystal. Much of what public works can do to assist with TIM activities revolves around their expertise in routinely managing safe and effective traffic control through work zones. “Other incident responders are not always thoroughly trained in this area,” he said. “You have the proper signage, equipment, and know-how necessary to set up advance warning, lane closure, and detour guidance for your work projects. These same principles can be applied to help provide safety for emergency crews responding to incidents. I urge you to reach out to other first responders; share your knowledge to help them set up a scene that is safe and in compliance with standards.”

The *Minnesota Manual on Uniform Traffic Control Devices* (MN MUTCD) is the go-to book for guidance in this area, Ray noted. The manual provides best practice guidelines for all traffic control devices used to regulate, warn, and guide road users on all roadways within Minnesota. This includes temporary traffic control in work zones, with Chapter 6-1 specifically addressing traffic control through emergency incident management areas.

## Monitor dispatch channels

“When you do respond to incidents with law enforcement, fire, and emergency medical services, remember that it has to be clear and obvious what it is you are doing on scene and what benefit you bring. Don’t just show up,” added McClellan, the freeway operations supervisor for MnDOT’s Regional Traffic Management Center.

To that end, McClellan suggested that in the Minneapolis–St. Paul Metro area, public works departments monitor their local police, fire, and other public works talkgroups via the Allied Radio



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Matrix for Emergency Response (ARMER) network. This statewide, shared public safety radio system is operated by MnDOT and was built for use by EMS, fire, law enforcement, public service, and public works, McClellan said. “Another option is to use off-the-shelf radio scanners to monitor your police and fire dispatch channels ... either way, it’s nice to receive a call about an incident and be able to relay that you know about it and are already on the way.”

Many dispatch centers also use computer-aided dispatch (CAD) systems, McClellan continued. This technology allows public safety operations and communications to be enhanced, assisted, or partially controlled by an automated system. This may include, among other capabilities, computer-controlled emergency vehicle dispatching and vehicle status and incident reporting. The main advantage CAD systems provide is that incident information is collected in real-time and made available immediately. “The trend now is to switch from voice pagers to smartphone apps that are integrated with the CAD software. With this, you get immediate notification of any incident sent right to your phone and can then quickly determine how to help,” he said.

## Build strong relationships

In addition to all of the latest technology available, the best strategy is for public works departments to build strong relationships with local emergency response dispatchers and responders, McClellan said. “Make sure they know who you are, how your department can help, and how to get a hold of you when they need you. And, help your staff to understand how their own jobs relate to what the fire and police departments do and how

you are all part of the same team working to keep responders and the public safe.

“The first thing to do,” McClellan said, “is focus on trust—both building and maintaining it. It’s important to understand that improving communication and coordination—and, ultimately, trust—will take dedicated effort over a long period of time.”

## Purchase equipment

Other ways public works departments can partner with first response agencies is by helping them purchase traffic control equipment, McClellan said. “The pricing for things like traffic cones, safety vests, and fold-up signs that I’ve seen in various fire and law enforcement catalogs is double or triple the price we would pay. So, talk to your law and fire departments and ask if they want to get in on your purchases to get a better deal. You can also make recommendations to help ensure they purchase quality equipment that meets MN MUTCD standards.”

## Take advantage of training

Finally, both McClellan and Ray advised public works professionals to take advantage of the many educational opportunities related to incident management (see sidebar). “TIM principles and concepts apply to every public works activity that takes place within the roadway,” Ray said. “Learning and applying these principles will help public works departments manage their work zones better, improve safety, and provide valuable support to other first responders.” **LTAP**

—Nancy Strege, LTAP freelancer

Nearly

**60 PERCENT**  
OF THE CONGESTION

and

**15 PERCENT**  
OF PEAK PERIOD CRASHES

on Twin Cities freeways  
are caused by roadway incidents  
due to crashes, stalled vehicles, or other factors.

## TIM training resources

- **National Traffic Incident Management Responder Training, National Highway Institute.** This comprehensive, online TIM program provides all levels of first responders a shared understanding of the requirements for safe, quick clearance of traffic incident scenes.
- **Scene Safe video training program, Minnesota Department of Public Safety and MnDOT.** This free, 30-minute training video provides insight to public works staff about emergency traffic control tactics used by first responders. This can be a catalyst for discussion on the similarities and differences between planned and emergency traffic control.
- **Federal Highway Administration.** The FHWA has TIM training resources, including local training options.

Please see our website for links. **LTAP**

## 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.

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## Local OPERA project: Turtle tunnel

**Project leader:** Peter Mott

**Agency:** Washington County

**Problem:** Turtles frequently cross a busy highway in Washington County, which is dangerous for both the turtles and drivers. Some motorists stop on the road to pick up the turtles and assist them in crossing, resulting in potentially hazardous traffic disruptions.

**Solution:** Washington County installed a specialized below-grade, dry culvert under the road to facilitate the safe travel of turtles and other reptiles from one side of the road to the other. Additionally, the county installed a fence designed to funnel the turtles into the tunnel as well as a camera and an infrared trail counter to observe and keep track of the animals using the culvert.

**Procedure:** The location for the turtle culvert was selected based on multi-year observations of problem areas and recommendations by the Minnesota Department of Natural Resources. Various fencing options were also explored and implemented. At the tunnel location, crews cut

pavement at a 10-degree angle and removed a section about 2.5 feet wide to allow for the tunnel and encasement material. The aggregate base was placed, and tunnel pieces measuring 3 feet were installed. The crew layered patch asphalt to encase the tunnel and leveled it with the existing pavement. Finally, a fence was installed 2,000 feet on the northwest side of the tunnel, and silt fences totaling 2,500 feet were installed at three other entry points.

**Results:** Since the culverts were installed, no amphibians or reptiles have been found dead on the road, and drivers no longer create traffic hazards by stopping to assist turtles crossing the highway.

**Approximate cost:** \$60,000

**OPERA funding:** \$10,000

**Implementation:** The county is still evaluating the performance of the installation, and it has established a monitoring protocol to ensure the fence and tunnel are being inspected frequently. Volunteer monitors walk the fence multiple times



Washington County

each week and document animals utilizing the fence and tunnel. The infrared counter provides a count of how many passes occur through the culvert. Additionally, the number of turtle crossings—and fatalities—will continue to be documented and analyzed.

Eventually, information will be uploaded to a “citizen scientist” website to share information with the public.

**Status:** Complete **LTAP**

### Fact sheets and reports online

The Exchange regularly highlights projects completed under the LRRB’s Local Operational Research Assistance Program (Local OPERA). Project fact sheets, along with the full project reports, are posted on the OPERA website: [mnlta.umn.edu/opera](http://mnlta.umn.edu/opera).

## Spreadsheet tool helps determine when it’s safe to use flashing yellow arrows

A spreadsheet tool designed to help MnDOT and other agencies determine where and when it’s safe to use flashing yellow arrows is now available on the Minnesota Local Road Research Board website.

Flashing yellow arrows warn drivers that they can make a left turn only after yielding to any oncoming traffic or pedestrians. These signals can help prevent crashes, move more traffic through an intersection, and provide additional traffic management flexibility. The new spreadsheet tool helps traffic engineers determine when the crash risk at an intersection is sufficiently low to allow flashing yellow arrows to be implemented safely.

Using the tool, engineers can choose their type of intersection and enter the available turning

movement count. The tool then generates a specialized graph for that intersection showing the relative crash risk by time of day. Any time the crash risk is at or below the level identified as acceptable, engineers can consider using flashing yellow arrows.

The tool was developed as part of a project led by Gary Davis, a professor in the Department of Civil, Environmental, and Geo- Engineering at the University of Minnesota. A tutorial is also under development.

Please see our website for links to the spreadsheet, instructions, and final report. **LTAP**



### Younger drivers *from page 1*

to alcohol use, driver error, lapse of attention, lack of seat belt use, and other risky driving decisions.

Although all young drivers ages 15–29 are at a higher risk for a crash than the rest of the population, teen drivers are especially at risk. Teens aged 15–19 are three times more likely to be involved in a fatal crash than drivers over age 20. Teen drivers have the highest crash risk per mile driven of all age groups, apart from the elderly.

The increased crash risk among teen drivers can be attributed to a few adolescent-specific risk factors such as immaturity, heightened impulsivity, and sensation-seeking behavior. These behaviors, combined with a lack of driving skills and experience on the road, all contribute to the higher crash rate among teens.

Teen crashes have predictable and preventable patterns. Teens are prone to making simple driving errors, are twice as likely to crash at night, and often crash while driving to and from school. Crash risk increases with the presence of other teen

passengers.

The toolkit then gives ideas and resources that local agencies can use when giving presentations to the community. Resources include:

- Five fact sheets—with many colorful charts and graphics—for distribution
- PowerPoint presentation template
- Public service announcement videos to incorporate as desired in the PowerPoint
- Examples of community-based partnerships
- Toward Zero Deaths (TZD) coalition information

The toolkit walks users through the process to plan and prepare presentations for different audiences, purposes, and lengths.

The toolkit (2015RIC04) and an accompanying brochure/handout (*TZD: Getting the Message to Younger Drivers: A Toolkit for Local Agencies*) are available at [lrrb.org](http://lrrb.org). **LTAP**

—Lexi Gusso, LTAP intern

### Minnesota younger driver crash facts:

- In 2013, young motorists ages 15–29 accounted for nearly 43 percent of unbelted deaths and nearly 50 percent of all unbelted serious injuries—yet this group represents only 23 percent of all licensed drivers.
- Alcohol-related driving resulted in 24 percent of crashes among younger drivers from 2009–2013.
- Between 2011–2013, illegal or unsafe speed accounted for nearly 25 percent of factors cited in fatal crashes involving drivers under age 30.
- Distracted driving was a contributing factor to 17 percent of crashes involving younger drivers from 2009–2013.

# MAINTENANCE

## Reducing road salt: getting the public on board

Many snow and ice control professionals are taking action to reduce the amount of chloride that reaches our waters from road salt operations. But minimizing salt use takes more than commitment from agencies: the public needs to do its part, too.

Below, Connie Fortin discusses how changes in public expectations and behaviors could help reduce salt use. Fortin, of Fortin Consulting, was one of the authors of the LRRB-funded report *Chloride Free Snow and Ice Control Materials*, which we featured in the fall 2015 *Exchange*.

### What level of service is expected, and why?

The level of service (LOS) that car commuters now expect on roadways is different than it was in the 1950s or even the 1980s. Improvements in technology have allowed the winter maintenance industry to increase the LOS to the point that most citizens expect bare pavement within hours after a storm.

The most common arguments for this higher level of service are based on public safety and economic impacts, but these are not completely valid.

People assume that there are more crashes during the winter, taking more lives. Crash data, however, show that fewer lives are lost during the winter than in the summer. Winter crashes, like their summer counterparts, occur primarily because of driver error, but they happen more often at lower speeds and have lower rates of significant injury.

The economic argument concerns the losses that may come from a shutdown of urban areas during winter events. But this argument fails to take into account the reality of driver safety and the ways that more and more workers can be productive away from the work site. If vehicles are on the road during crucial plowing windows, then the time during which commuters may crash and experience delays is likely to be greater than if they had simply delayed their work day by a couple hours.



### How can safe driving—or not driving—help winter maintenance crews?

Encouraging drivers to stay off the roads during storm events and clean-up could make it substantially easier for maintenance crews to remove snow and ice. Snow is easier to remove if it's not compacted by traffic. And if plow drivers don't have to treat a significant amount of compacted snow or ice, they can use less salt. Salting also is most effective when done at a slow speed, to reduce scatter. The presence of additional vehicles can make plow drivers feel pressured to go faster.

If employers and employees can work together to stagger start times, agree on work-at-home options, or otherwise reduce driving at the typical rush hour, the overall snow and ice removal process would yield better and quicker results—and use less salt.

Basically, we need to get drivers to take the pressure off agencies to have perfect roads in winter. Agencies will find it hard to change until citizens do.

### What are agencies doing to educate the public about winter driving?

The Minnesota Department of Public Safety offers public seminars on winter driving each year. MnDOT hits the airwaves and social media when the

season's first storm is forecast, and its website has much helpful information, including a new video about safe winter driving (see below). Some cities hold open houses about winter maintenance efforts. The piece that is often missing from these efforts, unfortunately, is a clear connection to the environmental degradation from road salt.

The Minnesota Pollution Control Agency (MPCA) makes this connection more explicit. Its website includes materials such as brochures and postcards for citizens, sample policies, manuals, and videos. MPCA also offers training for professionals and citizens (see below).

### What's the outlook?

The growth of recycling is a good model of how education can have a big impact over time. When I was a kid, recycling wasn't common, but now it's pretty much the norm in Minnesota. Education and public awareness made it happen. Seat belt use is another example of changing public behavior, but in that case, it took a law to make a big dent in the problem. I'm optimistic that if people know the issues about road salt, we can change voluntarily. It's up to all of us to get the message out there. **LTAP**

### MPCA video, training aim to reduce salt use

The Minnesota Pollution Control Agency (MPCA) has released a new 15-minute video—*Improved Winter Maintenance: Good Choices for Clean Water*. The video explains tools, techniques, and products that snow professionals and homeowners can use to keep driveways and sidewalks safe while protecting our waters. MPCA encourages cities to play the video on their local cable channel or distribute it however they can to their citizens, says Connie Fortin.

MPCA also offers training courses for winter maintenance professionals. The Level 1 Certification teaches snow and ice control best practices for workers in the public or private sector who maintain walkways and parking lots.

For more information, see go to [www.pca.state.mn.us](http://www.pca.state.mn.us) and search on "road salt and water quality." **LTAP**

### New MnDOT video: Winter Driving Safety

A new video from MnDOT—*Winter Driving Safety 2015*—is on MnDOT's YouTube channel. The 8.5-minute video begins with information about work-zone safety in general and then focuses on the snowplow—the "work zone in motion." The video is meant to help motorists handle the winter driving season safely.

More information about winter safety and work zones is at [www.dot.state.mn.us/workzone](http://www.dot.state.mn.us/workzone). **LTAP**

### Volunteer your plows for research project

The civil engineering program of Minnesota State University, Mankato is comparing configurations of roadway plow types, cutting edges, and attack angles at the Winter Area Roadway Maintenance Research (WARMR) facility set up at ValleyFair! and Canterbury Park in Shakopee, Minnesota.

The researchers, led by Associate Professor Steve Druschel, are asking for city and county agencies to send their plows at prearranged times and plow three parallel lanes of approximately 800 feet length. Typically, a plow will be on site for about one hour.

Minnesota State University, Mankato will produce a two-page summary observation of cut uniformity, cast, and snow cloud or debris formation. Summaries will be incorporated into a project report for MnDOT Research Services that may be downloaded for free

(beginning fall 2016).

To arrange a volunteer plow appointment, contact Druschel at 507-389-2115, **Stephen.Druschel@msu.edu**.

This project, known as Salt III, is the third phase of a MnDOT-sponsored research project titled Salt Brine Blending to Optimize Deicing and Anti-icing Performance. **LTAP**

### Related resources:

- *Deicing Study: Putting the Products to the Test*, video from Salt II (3:00, MnDOT, March 2014)
- *Salt Brine Blending to Optimize Deicing and Anti-icing Performance*, report from Salt I (MnDOT, July 2012)



David Gonzalez, MnDOT

## Fall Maintenance Expo: communication tips, roдео, and more

More than 2,500 people convened at the 2015 Minnesota Fall Maintenance Expo, held in St. Cloud on Oct. 7–8. One of the sessions focused on helping maintenance workers improve their leadership and communication skills. “This is especially important as more baby boomers retire and jobs open up for supervisors and

managers,” says instructor Tom Struve, a former member of Minnesota LTAP’s Steering Committee. We share his tips about e-mail and conversations below.

The expo also included the ever-popular snowplow roдео. Congratulations to the winners!

### Tips for writing e-mails

- Address your contacts with the appropriate level of formality and make sure you spell their names correctly.
- Always use the Subject field. Be sure the Subject field accurately reflects the content of your e-mail.
- Modify the Subject field to more accurately reflect a conversation’s direction as “successions” of discussions occur in a thread.
- Before clicking Send:
  - Check spelling and use spell check. E-mails with typos are a poor reflection of your professionalism.
  - Take the time to review e-mail to ensure your message is clear and you are relaying the tone you desire.
  - The words “please” and “thank you” go a long way! A great professional salutation is “Best Regards.”
  - Make one last check that the address or addresses in the To field are those you wish to send to.
  - Refrain from using the Reply to All feature; be discreet and use good judgment.
- If there’s a lot of content, give a brief synopsis. Be sure you are including all relevant details or information necessary to understand your request or point of view.
- Do not type IN ALL CAPS. That’s perceived as yelling.
- If you bold your type, know you are bolding your statement and it will be taken that way by the other side—times 10!
- Choose your e-mail name wisely. It will determine, in part, how you are perceived.
- If you cannot respond to an e-mail promptly, at the very least e-mail back confirming your receipt and when the sender can expect your response. **LTAP**



APWA-MN

The top four roдео drivers: Bill Tiede (Anoka County), Mark Meyer (City of White Bear Lake), Shane Turner (City of Ramsey), Ross Ostendorf (City of St. Louis Park)

#### Roдео winners:

- 1st place - Bill Tiede (Anoka County)
- 2nd place - Mark Meyer (City of White Bear Lake)
- 3rd place - Shane Turner (City of Ramsey)
- 4th place - Ross Ostendorf (City of St. Louis Park)
- 5th place - Terry Thorsten (Benton County)
- 6th place - David Tiemann (City of Rogers)
- 7th place - Pat Saice (City of Brooklyn Park)
- 8th place - Kyle Gill (City of St. Cloud)
- 9th place - Dan Stoen (Becker County)
- 10th place - Brian Marty (City of Oakdale)

#### Skid steer winners

- Wednesday
  - 1st place - Pat Saice (City of Brooklyn Park)
  - 2nd place - Trevor Greener (Stearns County)
- Thursday
  - 1st place - Amy Gabrielson (City of Litchfield)
  - 2nd place - Pat DeBaere (City of Oakdale)

### Tips for important conversations

Think of a recent important conversation: How many of these questions can you answer YES to?

1. Did I prepare ahead of time for this conversation?
2. Did I think about the best way to approach this person?
3. Was I aware of the other person’s communication style and did I speak to it?
4. Did I pay full attention, without multitasking, to what the other person was saying?
5. Was the intent of my communication to discuss and understand rather than be right?
6. Did I listen, without interruption, to the other person’s point of view even if I didn’t agree?
7. If I was asking the person to take a specific action, did I make my request clear and concise?
8. Did I summarize what I thought I heard the other person say before expressing my point of view?
9. Did I follow up to see if the conversation was successful—it led to a positive outcome for the other?
10. If the outcome did not meet my expectations, did I reflect on how to better communicate with that particular person?

8-10 Yeses indicate you’re the tops. Keep up the good work.

4-7 Yeses is OK. Brush up in certain areas.

0-3 Yeses. You have work to do. **LTAP**

## More word fun!

Good writing can **affect/effect** your job prospects.

The correct choice is **affect**.

In most cases, *affect* is a verb, meaning to influence (Rain *affected* the outcome of the football game). *Effect* is usually a noun, meaning result (It had no *effect*).

But there are some exceptions. *Effect* can sometimes be a verb, meaning to bring about or accomplish (We can *effect* lasting change through commitment.) And *affect* has rare uses as a verb, meaning to make a show of or pretend (He *affected* surprise when he opened his new skis).

It’s tricky! When in doubt, the odds are best to choose *affect* for a verb and *effect* for a noun. **LTAP**

### Name that ... plow?

Salty Dog. Blizzard Wizard. Sno Problem.

These are three of the clever names kids thought up for snowplows at the 2015 Anoka County Fair. The fun competition is held every year. “Kids come up with some unique names,” says Andrew Witter, assistant county engineer.

If you’ve nicknamed your plow, send us a quick e-mail ([mnltap@umn.edu](mailto:mnltap@umn.edu)) and we’ll publish them in our next issue. **LTAP**

# INFORMATION SERVICES

## 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](mailto:ctslib@umn.edu).

### Seat Belt Use on North Dakota Rural Roads: 2015

*(Upper Great Plains Transportation Institute, September 2015)*  
This report details trends in seat belt usage on North Dakota's rural roadways and methods of measuring that usage.

### Damage Assessment, Characterization, and Modeling for Enhanced Design of Concrete Bridge Decks in Cold Regions

*(Mountain-Plains Consortium, July 2015)*  
This report examines changes in bridges' mechanical properties for concrete and under fatigue loading and freeze-thaw cycles.

### Improved Safety Performance Functions for Signalized Intersections

*(Oregon Department of Transportation, August 2015)*  
This report developed new safety performance functions for signalized intersections by using Poisson-lognormal Generalized Linear Mixed model framework for total crashes and severe injury crashes.

### Refined Limiting Strain Criteria and Approximate Ranges of Maximum Thickness for Designing Long-Life Asphalt Pavements

*(National Center for Asphalt,*

*September 2015)*

This report investigates critical pavement design thresholds and approximate ranges of maximum thicknesses for flexible pavements so as to improve the cost-effectiveness of long-life asphalt pavements.

### Investigation of Negative Moment Reinforcing in Bridge Decks

*(Institute for Transportation at Iowa State University, September 2015)*  
This report investigates the Iowa DOT's policy regarding the required amount of negative moment reinforcement necessary to provide continuity over bridge decks.

### Stabilization of Peat Deposits for Roadway Construction and Remediation

*(Ohio Department of Transportation, August 2015)*  
This report details how to identify cost-effective remedial methods that would provide a permanent solution for existing pavements on peat, a soil with very high organic content.

### Bicycle and Pedestrian Data Collection Manual

*(MnDOT, July 2015)*  
This report summarizes the main elements of its bicycle and pedestrian data collection

program that is designed to collect bicycle and pedestrian traffic counts throughout Minnesota.

### Evaluating the Use of Crowdsourcing as a Data Collection Method for Bicycle Performance Measures and Identification of Facility Improvement Needs

*(Oregon Department of Transportation, August 2015)*  
This report explains a smartphone application designed to collect cyclists' routes, users, and comfort levels by combining GPS route data with results from surveys of cyclists.

### Laboratory Investigation of Grouted Coupler Connection Details for Accelerated Bridge Construction Projects

*(Institute for Transportation at Iowa State University, August 2015)*  
This report evaluates the grouted coupler connection details utilized on precast concrete elements on one of Iowa's bridges.

### Best Practices and Performance Assessment for Preventive Maintenance Treatments for Virginia Pavements

*(Virginia Department of Transportation, August 2015)*  
This report outlines guidelines for imple-

### 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 [www.mnltap.umn.edu/publications/library](http://www.mnltap.umn.edu/publications/library).

Other great resources are:

- LRRB's site: [lrrb.org](http://lrrb.org)
- MnDOT Library's catalog: [dot.state.mn.us/library](http://dot.state.mn.us/library). **LTAP**

menting a preventive maintenance policy for bituminous pavements by using a district-level treatment selection tool to facilitate the decision-making process. **LTAP**

## Work-zone app, classes available from ATSSA

The American Traffic Safety Services Association (ATSSA) has released a work-zone app for your phone. The free app serves as a handy tool to swiftly calculate the basic component parts of a typical roadway work zone. It can help you:

- Quickly determine both minimum device spacing and minimum number of devices needed for merging, shifting, shoulder, or flagger operations.
- Calculate the number of devices you need.
- Customize your results to incorporate local standards.
- Learn about and apply best practices for stationary lane closures and short-duration operations.
- Set up temporary traffic control areas.

Visit Google Play or iTunes to download the app.

The app is one of many training resources developed by ATSSA under a work-zone safety grant from the Federal Highway Administration. Other products

include videos, podcasts, and guidance documents.

Also under the grant, ATSSA offers a number of work-zone safety training courses to state and local governments and transportation agencies at a low cost of \$25 per course, per participant. Agencies can contact ATSSA to schedule or host classes. Three grant courses are also offered on a regular basis at various locations: Traffic Control Technician, Traffic Control Supervisor, and Flagger Instructor Training. In addition, free self-paced web training modules are available on the ATSSA site.

Read all about these resources and training opportunities: [www.atssa.com/WorkZoneSafetyGrant](http://www.atssa.com/WorkZoneSafetyGrant). **LTAP**



Backing *from page 1*

### Key backing principles:

- **Avoid the need to back up:** Operators should park defensively and leave room to pull away going forward when leaving a job site instead of backing. Another option is to use a route or location that accomplishes the task while moving forward.
- **Use a trained spotter:** If backing up is the only option, use a spotter with good technique and hand signals. Make sure spotters work from the driver's side, stay visible, watch for obstructions, and communicate with the driver. Establish a consistent standard throughout the agency that all operators and spotters understand.
- **Get out and look:** When it is necessary to back up and there is no spotter around, Rank recommends the simple GOAL technique: Get Out And Look. Do a complete 360 of the vehicle and the area around it to assess possible blind spots, distances, height clearance, and the presence of any activity or workers that could interfere with a safe backing operation.

### Additional backing tips include:

- Position mirrors for clear sightlines before operating the vehicle.
- Make sure backup alarm is working; if it is not or fails during maneuver, use a spotter.

- Keep driver's window down to hear and be heard, as well as the passenger window when backing or driving in the vicinity of workers on foot.
- Turn off the radio or other distracting devices; give complete attention to the backing operation.
- Minimize the number of work activities near moving equipment.
- Install signs in work areas that alert employees on foot about the location of moving vehicles.
- Don't allow riders in the back during the backing maneuver.
- Check for changing conditions in the area if the vehicle is stationary for more than two seconds.
- Sound the vehicle horn a designated number of times to signal a backing maneuver to all crew members.
- Back slowly, at a walking speed.
- Do not back more than 50 to 100 feet before stopping and rechecking the area for a clear zone.
- Follow more stringent guidelines in confined areas and for night work.

### Standard operating procedures

Rank recommends that public road agencies incorporate these rules into their standard operating procedures. Training that regularly reinforces safe practices like these also prepares equipment operators, spotters, and all workers to take preventive action.

Technology such as truck-mounted cameras are helping improve safe operation, but Rank cautions against relying on technology alone. Use these tools instead to supplement assistance from a spotter or a walk around the vehicle before backing up, he says.

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*(Adapted from the Wisconsin Transportation Information Center LTAP summer 2014 newsletter.)*



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# WORKSHOPS & TRAINING

## Calendar

If your professional organization meets on a regular basis, let us include the information here. Contact us at [mnltp@umn.edu](mailto:mnltp@umn.edu). For details and an up-to-date list of events in Minnesota, please see [mnltp.umn.edu/training](http://mnltp.umn.edu/training).

**15th Annual Road Salt Symposium**  
February 4, Chaska

**First Annual 2016 National Road Research Alliance Conference** (formerly TERRA)  
February 18, St. Paul

**Work-Zone Traffic Control Seminar**  
(0.5 RS elective credit) **LTAP**  
February 18, Mankato  
February 23, Rochester  
February 25, St. Cloud  
March 3, Brooklyn Center  
March 10, Lakeville  
March 29, Duluth

**Extending Pavement Life through Pavement Preservation Techniques, Strategies, and Preventative Maintenance**  
(1 RS required credit) **LTAP**  
February 24, Alexandria  
March 2, Blaine  
March 9, Mankato

**60th Annual Asphalt Contractors' Workshop/Quality Initiative Workshop**  
March 2, Brooklyn Center

**Minnesota's Transportation Conference**  
March 9-10, St. Paul

### ONLINE TRAINING: Anytime, anywhere!

**Culvert Design and Maintenance**  
(1 RS required credit) **LTAP**

**Sign Maintenance and Management for Local Agencies**  
(1 RS required credit) **LTAP**

**Gravel Road Maintenance and Design**  
(1 RS required credit) **LTAP**

**Work-Zone Safety Tutorial** **LTAP**

**Turfgrass Maintenance** (1 RS elective credit) **LTAP**

**Truck-Weight Compliance Training**  
(1 RS elective credit) **LTAP**

March 9, Alexandria  
March 10, St. Cloud  
March 16, Arden Hills  
March 17, Bloomington  
March 23, Rochester  
March 24, Albert Lea  
March 30, East Grand Forks  
March 31, Roseau  
Apr. 6, Mankato  
Apr. 7, Marshall  
Apr. 13, Bemidji  
Apr. 14, Duluth

### Roads Scholar credit

You can earn credits in Minnesota LTAP's Roads Scholar (RS) program by attending LTAP and CTAP workshops and other cosponsored events. To learn more or enroll in the program, visit [mnltp.umn.edu/roadscholar](http://mnltp.umn.edu/roadscholar).

### LTAP workshops

LTAP workshops, along with events cosponsored by Minnesota LTAP, are marked with an **LTAP** at left. Check the web for details and to register online: [mnltp.umn.edu/training](http://mnltp.umn.edu/training). To be added to our print or electronic mailing lists, e-mail [mnltp@umn.edu](mailto:mnltp@umn.edu) or call 612-625-1813.

### CTAP workshops

Circuit Training and Assistance Program (CTAP) workshops bring LTAP services to your neck of the woods. CTAP uses a fully equipped van to provide on-site technical assistance and training. Each CTAP workshop earns **0.5 RS elective credit**. For more information or to schedule classes, call the CTAP instructor, Kathy Schaefer, at 651-366-3575, or e-mail [Kathleen.Schaefer@state.mn.us](mailto:Kathleen.Schaefer@state.mn.us).

**Minnesota Roadway Maintenance Training and Demo Day**  
(1 RS elective credit)

**LTAP**  
May 19, Camp Ripley, Little Falls



## Find the hidden answer...and win an online course registration!

Many of you work long hours to keep traffic moving on wintry days. When you finish our winter puzzle, the letters in the shaded boxes, moving from top to bottom, will spell out a salt-free way to get around in the winter. Puzzle answers are taken from articles in this issue and from our online courses. E-mail the answer to us at [mnltp@umn.edu](mailto:mnltp@umn.edu) by April 15, 2016. We'll hold a drawing to pick up to five lucky winners of a free registration for one of our online courses. The winners and the answers will be posted in April. **LTAP**

### Last issue's answer...

The hidden answer to our fall puzzle—someone successful wearing the purple and maroon & gold—was **BUDGRANT**. Congratulations to our winners: Mat Campbell and James O'Connell, Chisago County; Bill Trygstad, Zenk Read Trygstad & Associates, Inc.; Brent Schulte, Little Falls Machine Inc. Skoll!

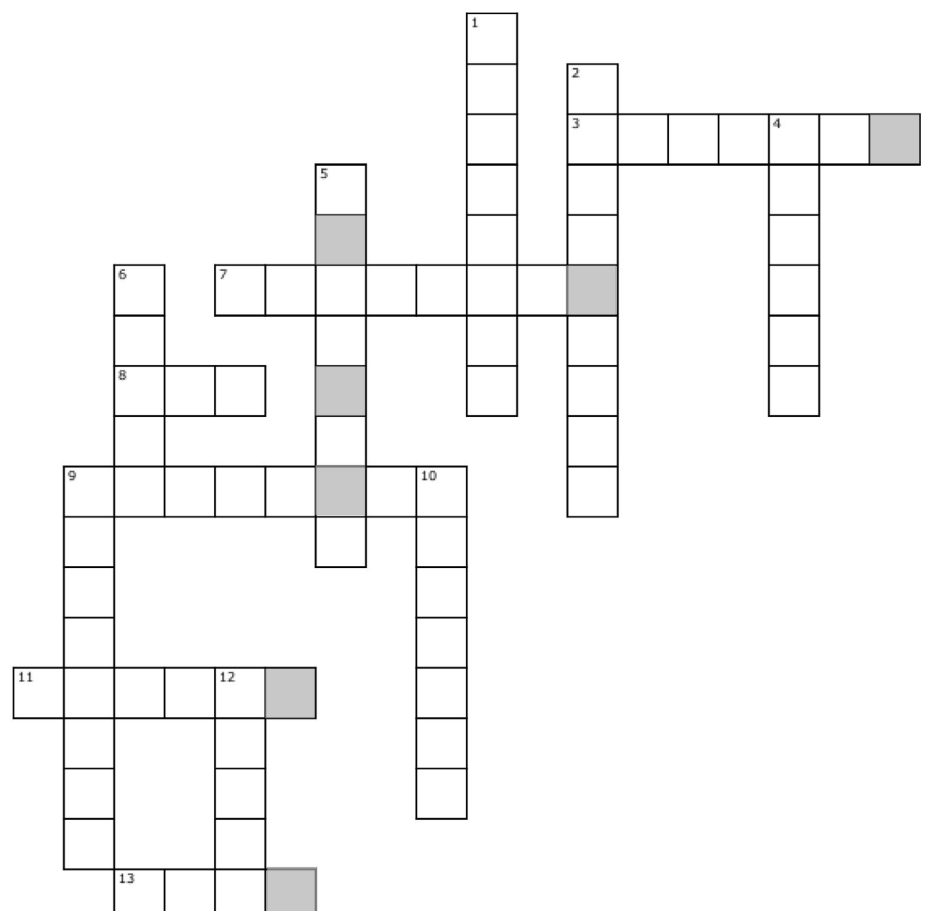
### Winter trekking

#### Across

3. Minnesota's go-to guidebook on traffic control devices.
7. A spreadsheet tool helps determine when it's safe to use \_\_\_\_\_ yellows.
8. ATSSA created one of these for work zones.
9. These can be added to a gravel mix ... or itch horribly.
11. Common method for making sign supports break away
13. Before you click \_\_\_\_, do a spell check.

#### Down

1. A result of inadequate culvert design
2. Public works crews can help make roads safer for \_\_\_\_\_ responders
4. Washington County built a \_\_\_\_\_ tunnel to help reptiles cross a highway.
5. The public needs to know what it can do to reduce this.
6. Teens are twice as likely to do this at night.
9. MnDOT released a safety video about this "work zone in motion."
10. Use a trained \_\_\_\_ when you're backing up.
12. Part of a gravel road ... or headgear worn by a king or queen



# Minnesota LTAP Training 2016

Winter is a great time to stretch your mental muscle power. But whenever you find the time, LTAP will be there. Choose from our in-person and online classes and earn credit for a Roads Scholar certificate. LTAP training will strengthen your skills—and pump you up.

## Workshops Around the State

Workshops are offered at convenient locations in these categories:

- Drainage and Erosion Control
- Equipment
- Information and Management Systems
- Roadway/Bridge Maintenance
- Traffic Control
- Workforce Development

## CTAP at Your Shop

The Circuit Training and Assistance Program (CTAP) brings training, technical assistance, and technology transfer to your site.

## Online Training

Five courses are available anytime, anywhere:

- Sign Maintenance and Management
- Culvert Design and Maintenance
- Gravel Road Maintenance and Design
- Work-Zone Flagger Tutorial
- Turfgrass Maintenance

## Become a Roads Scholar

Complete eight credits within five years to earn this valuable professional development credential. There is no enrollment fee.

## Truck-Weight Education Program

This program promotes voluntary compliance to reduce damage to public roads and highways from overweight vehicles. Workshop attendees learn how to haul the most legal weight without violating the truck-weight laws.



[mnlta.umn.edu](http://mnlta.umn.edu)

Phone: 612-626-1077  
E-mail: [mnlta@umn.edu](mailto:mnlta@umn.edu)

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