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1. Roundabout intersection
2. Four-leg intersection
3. Displaced left-turn intersection
4. Median U-turn intersection
5. Double roundabout interchange
6. Diamond interchange
7. Cloverleaf interchange with C/D lanes
8. Single-point interchange
9. Diverging diamond interchange
10. Directional T interchange.

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Plowing intersections and interchanges: training materials available

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Plowing intersections and interchanges: training materials available
Project of the Year: City of Hopkins – The Artery. Project team: Bolton & Menk, Inc. (project design firm) and Meyer Contracting (project general contractor).

The concept of “The Artery” began a decade ago, originally envisioned to increase visibility of the historic downtown Mainstreet and connect the city core to the main vehicular thoroughfare of Excelsior Boulevard. With this vision as a starting point, the City of Hopkins desired a vibrant, interactive, and pedestrian-friendly plan that would draw people from the proposed Southwest Light Rail Transit (SWLRT) downtown Hopkins station through the Artery to Mainstreet. The Artery integrates highly interactive public art, innovative technology, and a two-way cycle track connecting two regional trails. It also incorporates educational elements of storytelling and cultural history all within the public realm, making these three blocks a prime destination along the SWLRT Metro Green Line.

Honorable mention:
• Nine Mile Creek Regional Trail – Edina Segment. Managing agency: Three Rivers Park District.
• CSAH 83 improvements. Managing agency: Shakopee Mdewakanton Sioux Community

American Public Works Association – Minnesota Chapter
Director or Manager of the Year: Brian Wagstrom, director of public works, City of Minneapolis
Maintenance Professional of the Year: Bobby Brunette, Street Maintenance, City of St. Paul
Engineering Technician or Field Personnel Award: Lane Wegener and Dale Running, City of Eagan Engineering/Public Works Department

Hugo G. Erickson Award: Mark Maloney, director of public works, City of Shoreview

Friends of Minnesota Counties:

Governor, MnDOT

Commissioner, MnDOT

Transportation:

Friends of Minnesota Counties
“Local RICWS” project to develop a lower-cost inter
neers and their participation in St. Louis County’s
necessarily

religion,

all

transportation, City of Shoreview

Project of the Year

Project

MCEA award.

CSAH 1 reconstruction in Fillmore County earned an
miles project cost was $14.8 million.

The Nine Mile Creek Regional Trail project received honors from CEAM and APWA-MN.
**Local OPERA project: Biobased sealant for bridge decks**

**Who led the project?**
Kent Eerner, director of public works/city engineer, City of Hutchinson

**What was the need?**
Most bridge sealants are quite toxic and contain many compounds that can be dangerous. The City of Hutchinson wanted a more environmentally friendly and operator-friendly option for sealing bridge decks.

**What was the project?**
City staff chose to use an Opti-SEAL™ product from BioSpan Technologies because it is 90% biobased.

**How was it done?**
The bridge deck, sidewalk, and sidewalls were cleaned prior to application. The sealant was placed in three applications.

Two areas of the bridge were left untreated to allow for comparison. One area was a sidewalk; the other, on the opposite side of the bridge, was the bridge deck from the fog line to the guardrail.

To test the material, staff sealed large rain-gauge tubes to treated and untreated areas at opposite ends of the bridge to measure water loss over a period of days. This testing was done one month following application. After installing the tubes, crews measured results two days later and again six days later.

The product was applied with a utility-vehicle-type sprayer. It can also be applied with a handheld spraying tool for areas that are hard to reach with the spray bars.

Traffic remained open during the project. Traffic was restored after the material was no longer "running" on the concrete surface. After application, there was a wet look to the pavement for about eight hours.

**What were the results?**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Treated Deck Water Loss</th>
<th>Untreated Deck Water Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/15/17 – 08/17/17</td>
<td>0.74&quot;</td>
<td>0.01&quot;</td>
</tr>
<tr>
<td>8/15/17 – 08/21/17</td>
<td>0.84&quot;</td>
<td>0.02&quot;</td>
</tr>
<tr>
<td>8/15/17 – 08/17/17</td>
<td>0.02&quot;</td>
<td>0.09&quot;</td>
</tr>
<tr>
<td>8/15/17 – 08/21/17</td>
<td>0.08&quot;</td>
<td>0.08&quot;</td>
</tr>
</tbody>
</table>

**Unlikely to severely reduce chloride.**

**Untreated sidewalk water loss**
8/15/17 – 08/17/17 0.01" 8/15/17 – 08/21/17 0.09" 8/15/17 – 08/21/17 0.01" 08/15/17 – 08/21/17 not available

**Strategies to help mitigate chloride from road deicers**

U of M researchers measured the transport and accumulation of chloride from road deicers in a metro-area watershed. Their findings revealed a greater infiltration of chlorides into soil and subsurface waters than was previously assumed.

“The results will help investigators and policymakers explore ways to capture chlorides and mitigate their damaging environmental effects,” says William Herb, a research associate with the U of M's St. Anthony Falls Laboratory.

Overall, the team observed substantial chloride retention via infiltration to soils and groundwater. Researchers also found that winter rain-on-snow events and the first major prolonged thaw each season moved surface chlorides most effectively into the watershed.

The research team used the data and modeling to examine potential strategies for reducing or mitigating the spread of chloride, including capturing low flows, seasonal runoff capture, and capture based on salinity.

“Based on this research, we now know that deicer chemicals are staying in the soil and moving in the watersheds, and this should change how we manage ice and snow control,” says Wayne Sandberg, deputy director of the Washington County Department of Public Works. "The next questions are what can we do with that knowledge and what changes can we make."
SOS: StopOverSalting to save our waters

The Freshwater Society presented its Environmental Leadership Awards at the 19th Annual Road Salt Symposium on February 7 in Plymouth. Individual awards were given to six recipients: Stephen Druschel, professor of civil engineering at Minnesota State University, Mankato; the Edina Public Schools District; Precision Landscaping & Construction Inc.; StopOverSalting; Nine Mile Creek Watershed District; and MnDOT District 1. Highlights from three of the recipients follow.

StopOverSalting

The citizens in StopOverSalting (SOS) are volunteers and Master Water Stewards who were drawn together over concerns about the irreversible damage deicers cause to Minnesota’s waters and the oversalting they saw at properties in their communities.

Initially members focused on community education with businesses and nonprofits in Edina, Minneapolis, and St. Paul. They spoke to more than 250 property owners and applicators about the costs of chloride to businesses and the environment. They encouraged attendance at Smart Salting trainings, swept up over one ton of excess salt from properties, and worked with their cities and watersheds.

From this they learned that property owners and applicators were concerned about the damage chlorides cause to water and fisheries as well as to structures and landscapes. But the belief that more salt is better and provides protection from lawsuits was a barrier to reducing overapplication. They began looking beyond education for solutions to the problem.

In 2017, StopOverSalting organized with the goal of passing statewide limited liability legislation for commercial applicators. The members committed themselves to learning about the legislative process, contacted the governor and state agencies through the 25% by 2025 initiative, found House and Senate authors for the bill, and educated and testified at the legislature. They worked with cities and watersheds to secure resolutions of support, creating new allies and momentum for the legislation and a broad coalition of support. Although the legislation was not enacted in 2018, the forward progress was a success and laid the groundwork for 2019.

Nine Mile Creek Watershed District

Nine Mile Creek, located in the Twin Cities’ south-west metro, is impaired by chloride. For Nine Mile Creek to be considered “healthy,” salt applications in the watershed need to be reduced by 62 percent. The Nine Mile Watershed District passed a resolution of support for limited liability protection for private applicators. It recommended a resolution of support to the Minnesota Association of Watershed Districts (MAWD) that was unanimously adopted by the MAWD board. The district also worked with members of StopOverSalting and participated in the Edina winter maintenance model contract advisory committee last fall.

Nine Mile Creek is the first watershed to require a chloride management plan as a part of its permit process. It offers cost-sharing grants to help organizations implement winter maintenance best management practices.

Nine Mile Creek hosts Smart Salting Level 1 and Level 2 trainings annually and works with other organizations to put on two-hour Salt Solution workshops that focus on winter maintenance for nonprofits and places of worship.

MnDOT District 1, Duluth Subarea KAC Project

MnDOT District 1 implemented two potassium acetate routes in the Duluth area in the 2017–2018 winter season. Potassium acetate has been used on automated bridge systems and by airports for years but is not commonly used to treat roads.

The preliminary results are promising, with comparable bare-lane repair time. Last season the district reduced salt use by 70 percent compared with similar lanes without the acetate treatment.

In the past the agency had used magnesium chloride in automated spray systems because it is 3.5 times less expensive, but it found that using potassium acetate requires a quarter of the material, which translates to about equal costs for that application.

Below 15°F many products are ineffective. Last season District 1 found that during the very cold months of January and February, potassium acetate was the chemical that was most effective in compacted and icy areas. It has not received public complaints.

To build awareness of the new road map and provide tools to implement the TZD national strategy, the project team is hosting a biweekly webinar series as well as a series of workshops held in conjunction with national conferences.

This work was sponsored by the American Association of State Highway and Transportation Officials in cooperation with the Federal Highway Administration, and was conducted in the National Cooperative Highway Research Program, which is administered by the Transportation Research Board of the National Academies of Sciences, Engineering, and Medicine.

Learn more:
- TZD Road Map tools, webinars, and workshops: cts.umn.edu/nationalTZD

StopOverSalting chose a distinctive teaspoon on a red lanyard for its communications materials.
Cities advised to set aesthetic standards for wireless infrastructure

On September 26, 2018, the Federal Communications Commission approved a ruling focusing on state and local management of small cell wireless infrastructure deployment. "The ruling has key differences from Minnesota's existing law," says Kyle Hartnett, League of Minnesota Cities (LMC) staff attorney. "It places additional limitations on cities' ability to regulate deployment."

In light of the new FCC ruling, Hartnett encourages cities to review which city assets they will make available for wireless infrastructure and set standards for the technology each asset can hold. The ruling applies largely to right-of-way, with the exception of "light fixtures." The FCC ruling allows cities to place "reasonable" aesthetics requirements on a case-by-case basis. The FCC ruling requires that aesthetics standards be "reasonable, no more burdensome than other infrastructure, and objective"—and the standards must be published by April 15, 2019. "If standards aren’t in place, then providers could put wireless wherever they want," he says, noting that this could be of particular concern in areas with special decorative treatments such as light fixtures.

The new 5G communications networks coming this year are causing concern for some city officials. "5G is a completely different technology," says John Paulson, project, regulatory, and environmental manager with the City of Hutchinson. "In Hutchinson, there would be five tower locations for macro-sites, but there might potentially be 50 small cell sites in just our community."

As the small cell towers and their accompanying underground infrastructure are added, they have the potential to conflict with factors such as city aesthetic standards and future building projects. "All of a sudden there are more utilities and communications infrastructure in the ground, which adds that much more time, risk, and cost associated with rebuidling a roadway," Paulson says.

Minnesota statutes enacted in 2017 require that cities develop standards for small cell installation. With the help of the League of Minnesota Cities, the City of Hutchinson adopted ordinances that comply with the statutes but retain a degree of municipal control and flexibility. The 2018 FCC ruling requires even more specification from cities. The ruling makes it more efficient and cost-effective for providers, but any sites that don’t exactly meet the city’s requirements will have to be denied. "Our local right-of-way is managed locally by professionals who know what’s there and how to utilize it," Paulson says. "If we have to be prescriptive, we start losing some of that flexibility to use common sense."

The city is in the process of updating its small cell ordinances. The aim is to solidify details—such as the height of the small cell support poles, the color they must be painted, and how far apart they can be spaced—to comply with the FCC ruling.

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**Case study: Hutchinson**

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**So you own a drone. Now what?**

That’s the title of a new video created by Twin Cities PBS (known as TPT) and MnDOT in partnership with the Federal Aviation Administration (FAA). Speakers in the short video discuss steps to take before your maiden flight.

Tony Fernando, MnDOT’s unmanned aircraft systems program administrator, says the first thing a drone pilot must do is register with the FAA. "Remember that drones are aircraft—and aircraft are very highly regulated," he says.

Several additional state and federal requirements need to be fulfilled before operating a drone for purposes other than recreation.

In the video, Fernando shares specific guidelines for safe drone operation: Keep the aircraft in sight, do not fly over people, and stay clear of airports, heliports, and hospitals. He also discusses smartphone apps that allow users to do their flight planning.

This is the first in a series of videos related to drone safety that MnDOT Aeronautics is producing with TPT. The video and more guidance from Fernando are available on the TPT’s “Twin Cities PBS Originals” website.

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**Learn more:**

- so you own a drone. Now What? (TPT and MnDOT, Dec. 18, 2018, 4:28) tptoriginals.org
- Dronezone.faa.gov
- so-you-own-a-drone-now-what
- Every Day Counts

Unmanned aerial systems are one of the innovations in EDC-5. UAS use is expanding across the state DOTs, and the number of UAS applications is increasing steadily. Learn more at fhwa.dot.gov/innovation/everydaycounts.

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**MnDOT develops UAS expertise for bridge inspection**

Since 2015, MnDOT has used UAS to inspect more than 60 Minnesota bridges, developing procedures and perfecting techniques.

Phase II of the research evaluated a drone that flies within a protective rolling cage to take readings and videos in confined spaces. Researchers developed a system for using this new drone with other UAS, cameras, and inspection tools to create reports detailed with models, maps, and photographs. The new system saves thousands of dollars a day inspecting large and difficult structures, keeps inspectors out of harm’s way, and all but eliminates lane closures.

“A drone won’t replace an actual inspector but will enhance inspections,” says Jennifer Wells, state bridge inspection engineer with MnDOT’s Bridge Office. “It saves time and considerable cost if we want to reach remote areas.”

MnDOT intends to develop a UAS bridge inspection and training service that will be made available to state and local agencies throughout Minnesota.

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**Learn more:**

- Technical summary: MnDOT Continues to Develop UAS Expertise for Bridge Inspection (MnDOT, 2018-2675, Jan. 2018)

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**Using drones can REDUCE INSPECTION COSTS by up to 40 PERCENT compared to traditional methods.**
Five factors for successful longitudinal joint construction

It’s easy to say that good workmanship is the key to a good longitudinal joint, but good construction is a combination of specific factors. A recent report completed by the National Road Research Alliance (NRRA) Flexible Team digs into those specific factors and outlines some elements you should focus on.

The DOTs that contributed to this report were California, Illinois, Michigan, Minnesota, Missouri, and Wisconsin.

“The longitudinal joint is the weakest link in the chain,” says John Garrity, bituminous engineer for MnDOT’s Materials and Road Research Group. Density is key to pavement durability, he says, and it’s difficult to maintain density across the mat at that place where the first and second pass of the paver meet—the longitudinal joint. Here are some factors to double-check during construction.

Straight lines—This may sound like a no-brainer, but you need to have a straight reference line for the paver to follow during the first pass. The report suggests a simple stringline for the reference line. Whatever you use to establish this line, don’t forget to mark it. The six states diverge on how to construct the actual joint. One method, preferred by all the states except Minnesota and Missouri, is called the Notched Wedge Joint. With this joint, the screed has a form attached on the end so it shapes a notched, tapered edge on the first pass. This taper is about 12 inches wide depending on lift thickness. On the second paver pass, the screed overlaps the first paver pass and fills in the notched wedge.

Steel first—When the rollers start compacting the mats, the report recommends that you begin with a steel roller (rather than rubber) with a 6-inch overhang from the hot side of the mat. The issue with a steel roller (rather than rubber) with a 6-inch overhang from the hot side of the mat. The issue with asphalt compaction, Garrity says, is when you have an unconfined edge, the asphalt will want to move laterally at that edge and then you lose density. Rubber rollers on an unconfined edge will mush out the mix if positioned too closely to the edge.

Overlap—Make sure, during the second (adjacent) paver pass, that the screed is overlapping the first paver pass by 1 to 1.5 inches. Moreover, the overlap should be about 1/4 inch higher than the adjacent mat before the rollers compact the joint.

Roller placement—There are two schools of thought on this. The two-pass method puts the first roller pass on the hot mat and 6 inches from the joint. On the second pass, the roller goes directly over the joint, essentially pinching the material in place. The other method only does one pass with the roller 6 inches over the joint from the hot mat side.

Joint shape—The six states diverge on how to ensure the best density when compacted.

The importance of density at the joint cannot be stressed enough, Garrity says, because the less density in the longitudinal joint, the more porous it is. That means water can get in the joint and reduce the performance of the material. Cracks in the longitudinal joint are made even worse in multilane roads where cars change lanes a lot. When it rains, these cars go over the joints and push water into cracks “like a pressure sprayer,” he says.

As an added precaution, both Illinois and Minnesota apply a longitudinal joint adhesive before paving the adjacent paver pass in order to keep the water out of the joint. Photos in the report show how these joint sealers are performing.

A team at Binghamton University–State University of New York is looking at adding a fungus to concrete to enable self-healing. When the fungus is mixed into concrete, it lies dormant until the first crack appears, says assistant professor of mechanical engineering Congrui Jin (ScienceDaily, Jan. 17, 2018). When oxygen and water seep in, the fungus would produce spores to fill any microcracks. While the research is still its early stages, Jin believes further investigation in microorganisms such as fungi and yeasts for self-healing concrete is of potential importance. (Vice News, March 12, 2018)

Videos explain essentials of concrete and asphalt pavement preservation treatments

Two new videos for local agencies cover the essentials of preservation treatments for concrete and asphalt pavements. The videos are part of the FHWA Federal-Aid Essentials collection of informational videos for local agencies.

The videos explain a long-term strategy of applying timely and appropriate preventive treatments to maintain good pavement condition and extend pavement life.

The concrete video (7:08) reviews five preservation techniques—joint resealing and crack sealing, diamond grinding, grooving, load-transfer restoration and cross-stitching, and partial and full-depth repairs—and explains how a county applied the treatments on a maintenance project.

The asphalt video (6:33) reviews treatments such as crack and fog seals, chip seals, and overlays and reviews how one municipality reassessed its pavement preventive maintenance guidelines in an effort to extend pavement life.

Learn more:
• Federal-Aid Essentials video library: fhwa.dot.gov/federal-aidesentials/indexofvideos.cfm

Could a fungus heal concrete?

The NRRA’s Pavement Workshop, held on the U of M St. Paul campus, is an opportunity to learn, share, and discuss the future of the nation’s roads. Presenters include some of the foremost pavement engineers and experts from state DOTs, private companies, associations, and academic institutions.

An extra day was added this year for a six-hour session titled “Building Information Modeling for Pavements . . . Asset Management, Planning, Design and Construction.”

The event also includes a MnROAD tour on May 22 and an FHWA Mobile Concrete Trailer session on May 23. See the NRRA website for details and registration.

The other joint is called the Maryland Joint. It is a butt joint and therefore neither notched nor tapered. It’s just a straight edge abutted up against another straight edge with enough overlap to ensure the best density when compacted.
What paths have Roads Scholars taken since graduation? In this issue we hear from Charles Fredericks, a streets engineering technician with the City of Eagan and a Roads Scholars.

**What did you like best about the Roads Scholar Program?**

I enjoyed the Roads Scholar Program because it gave me an opportunity to not only enhance and refine my knowledge in areas I was familiar with, but it also gave me the opportunity to learn about areas of my field that I don’t often get to encounter. As a hands-on style learner, the field demos in certain classes proved extremely valuable and gave me the opportunity to put into practice what I learned in the classroom.

**How does being a Roads Scholar help you in your work?**

Being a Roads Scholar will help me in the future because it expanded my knowledge in several areas of my field, which will give me a competitive edge in advancement opportunities.

**What has been the most surprising part of your work?**

The most exciting or surprising part of my work is the consistent change in the day-to-day. You have your ongoing projects and reoccurring monthly/yearly projects, but each day brings new challenges to face and new things to learn. This aspect of my job, and Public Works in general, is exciting to me because it keeps things fresh and always provides opportunities for growth.

**What can people learn from your path?**

My path is really just beginning to be paved, but I understood early on that a passion for learning is the key to success. It opens doors to new possibilities, provides endless opportunities for growth, expands your network, and prepares you for whatever comes next.

Federal-aid Essentials for Local Agencies

This FHWA program is designed to help local agency professionals navigate the Federal-aid Highway Program. Launched in 2012, the program offers a central online library of informational videos and resources designed specifically for local public agencies. A wide range of video modules address questions and concerns. Topics include finance, right-of-way, civil rights, and project development.

Learn more:

- Federal-Aid Essentials video library: fhwa.dot.gov/federal-aidessentials

Roads Scholars: Where are they now?

What paths have Roads Scholars taken since graduation? In this issue we hear from Charles Fredericks, a streets engineering technician with the City of Eagan and a 2018 Roads Scholar.

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Additionally, I first became interested in Public Works because I was intrigued by the idea of improving

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My path is really just beginning to be paved, but I understood early on that a passion for learning is the key to success. It opens doors to new possibilities, provides endless opportunities for growth, expands your network, and prepares you for whatever comes next.

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 mntltap.umn.edu/publications/library.

Other great resources are:

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

The 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.
### Online Training:

**Anytime, anywhere!**

- **Installation and Management of Roadside Turfgrasses**
  - (1 RS credit) LTAP
- **Turfgrass Pathology Course**
  - (0.5 RS credit) LTAP
- **Culvert Design and Maintenance**
  - (1 RS credit) LTAP
- **Work-Zone Safety Tutorial**
  - (0.5 RS credit) LTAP

**PLEASE NOTE:**
Two of our online courses are unavailable while we transition to a new learning management system. We will send an electronic announcement when they're ready. The courses are:
- Sign Maintenance and Management for Local Agencies
- Gravel Road Maintenance and Design

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### Workshops & Training

#### Online Training:

- **Installation and Management of Roadside Turfgrasses**
  - (1 RS credit) LTAP
- **Turfgrass Pathology Course**
  - (0.5 RS credit) LTAP
- **Culvert Design and Maintenance**
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- **Work-Zone Safety Tutorial**
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### Demo Day to showcase drones

The Minnesota Roadway Maintenance Training and Demo Day will be held May 16 at the Olmsted County Fairgrounds in Rochester. Attendees will earn a Roads Scholar credit.

Demo Day is showcasing an exciting new topic this year: drones as an emerging technology for use in our transportation system. Drones have many potential uses—from inspection and maintenance of construction and existing infrastructure assets, to operations, traffic crash investigations, and emergency response. What other possible uses could they have? We would love to hear your ideas!

You will also have the opportunity to refresh and learn new ways to properly inspect securement devices and secure cargo according to regulation requirements. You’ll also hear about the latest in CDL rules. And, just in time for summer, we’ll bring you up to speed on the latest in asphalt pavement maintenance and show demos on spray velocity and slurry patching.

We hope to see you there!

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### Brush up on your winter skills with Clear Roads online training modules

It’s never too late to brush up on your winter skills—not in Minnesota! One training option is the Clear Roads snowplow operator and supervisor training program, meant for both entry-level and experienced snowplow operators and supervisors. The training materials are available free of charge to any agency, including local and county highway departments.

The 22-module program covers equipment, materials, techniques, and procedures. A test question from the second module is shown at right (answer on page 7). For access to the Clear Roads training materials, email Clear Roads administrator Greg Waidley at greg.waidley@ctcandassociates.com or call 608-490-0552.

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### 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 [mnltap.umn.edu/roadsscholar](http://mnltap.umn.edu/roadsscholar).

### 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: mnltap.umn.edu. To be added to our print or electronic mailing lists, email mnltap@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 credit. For more information or to schedule classes, call the CTAP instructor, Kathy Schaefer, at 651-366-3575, or email Kathleen.Schaefer@state.mn.us.

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### Minnesota Roadway Maintenance Training and Demo Day

- **May 16, Rochester**

### National Road Research Alliance Pavement Workshop

- **May 21-23, St. Paul and Albertville**

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### Clear Roads snowplow operator and supervisor training program

- **Clear Roads**

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### Winter skills

Brush up on your winter skills with Clear Roads online training modules.