

TECHNOLOGY EXCHANGE

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Mayo Clinic: safer sidewalks, less salt



The Mayo Clinic in Rochester is a big place, especially for winter maintenance crews. Around 65,000 people visit the campus every day, with foot traffic 24 hours a day, seven days a week. The campus has 15 miles of sidewalk, 120 acres of parking lot, and 300 doorways, all of it in need of snow removal in the winter. Heavy salting has traditionally been the tool

Mayo continued on page 4

Roads Scholar Program launches leadership certificate

As part of its Roads Scholar Program, Minnesota LTAP will begin offering a Leadership, Supervisory, and Operations Management Certificate in January. “The new certificate is designed to meet the growing need for these types of skills,” says Mindy Carlson, Minnesota LTAP program director. “Roads Scholars



who have already completed our Maintenance Operations and Technical Certificate can take their education to the next level.”

The new certificate is an ideal option for new managers, supervisors, and those transitioning into a leadership role. It focuses on the management of local agency and public works organizations and operations. Courses are instructed by public works professionals and are designed to further your understanding of:

- Organization and functions of public works and public works professionals
- Technical functions undertaken by public works professionals, with emphasis on roadway design, construction, and maintenance

Certificate continued on page 6

New at ClearRoads.org

Material application methodologies guidebook

This guidebook will help superintendents and supervisors determine the most sustainable and effective material types, application timing, methods, and rates for the particular snow and ice conditions they encounter. It is based on best practices from interviews with state and local agencies.

The guidebook also has single-page handouts that operators can print and use for quick reference. Handout topics include deicing and anti-icing, sanding, and pre-wetting.

Mobile technologies for assessment of winter road conditions

This study provides a comprehensive and comparative analysis of four commercially available mobile road weather information systems (RWIS) sensors.

The study compared the four sensors’ performance while measuring air temperature, surface temperature, relative humidity, surface condition, water film thickness, and friction. The evaluation also compared qualitative aspects of the sensors such as installation methods.

The project found that overall, sensors performed similarly across all parameters. Thus, the report recommends that agencies select sensors based on the factors they value most, including both parameter accuracy and factors such as cost and installation. ■



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

HONORS

National Mousetrap award: portable manhole

Each year the *Exchange* honors the recipients of Minnesota's Build a Better Mousetrap competition and shares highlights of their work. Starting in this *Exchange*, we'll also publish some award-winning innovations from the National LTAP Mousetrap competition. First up: a portable manhole for training.

The highway department of Beacon, New York, recently developed a new way to encourage employees to think outside the box, or in this case, the manhole.

There are hundreds of thousands of manholes in municipal streets across the country. They are portals to many vital city systems, and maintenance crews must be able to navigate them safely because these types of confined spaces present special dangers not found in normal work areas.

To provide safer, more flexible training to its maintenance workers, the department created an innovative way to conduct confined space training



that reduces travel and downtime. It involves the invention of a portable manhole that can be used indoors, eliminating the unpredictability of Mother Nature.

"We used to go on site to one of our confined spaces, but that's outdoors," said Working Supervisor Reuben Simmons. "Having something that is built and can be used indoors makes scheduling the training so much easier. In the past, if we tried to schedule the training and it turned out to be a bad weather day, it would require us to reschedule, which affected a lot of people and their time."

The city's highway superintendent, fire inspector, and maintenance mechanic came up with the idea to build a mobile structure that is a mock-up of a complete confined space manhole. In addition to avoiding inclement weather, the system also provides safer training for larger groups in one session, which reduces lost time traveling to various training site locations.

A tripod is set up over the simulator, and an employee strapped in a harness is hooked up to the tripod. A smell meter is dropped in to ensure there are no odorless gases and it is safe for entry. Additionally, the team developed a confined space

checklist to review all hazards and procedures for the trainees to use during the training.

Maintenance mechanic Dave Way is a carpenter by trade and built the structure in just five days.

"We don't have the room to store it, so it had to be portable," he said. "We take it apart and put it back together several times a year because people [from other agencies] like the City of Newburgh and the fire department borrow it from us." Way also added a window to the simulator to accommodate firefighter "bailout" training.

Materials cost about \$1,500, and the team is already thinking of improvements. "If I had to do it over again, I'd make it out of aluminum, because wood is a little heavy, especially the staircase," Way said. More than 100 people use the simulator annually across multiple agencies.

"Ironically, more people from other agencies have used this than people from our highway department," Simmons said. "We're really excited about the difference we've been able to make in our community. We're saving lives, time, and money." ■

(Reprinted from fhwa.dot.gov/clas/ltap/.)

Submit your ideas for the 2020 Mousetrap competition!

To enter Minnesota's 2020 Mousetrap competition, submit an entry form by May 31. 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. ■

Steering committee chair leaves record of efficiency, streamlining



Mitch Rasmussen

Mitch Rasmussen brought a passion for helping local agencies to his roles as assistant commissioner of MnDOT's State Aid Division and chair of the Minnesota LTAP Steering Committee. He left those positions earlier this year and is now a principal in the Minneapolis office of SRF Consulting Group, Inc. Below, he looks back at accomplishments and offers thoughts for the future.

What are some highlights from your time at State Aid?

Just being there was a highlight—it was a great job. The best part was the people I got to work with. The culture is so good—people are 100 percent committed to helping cities and counties.

One policy accomplishment happened after we

received a legislative mandate to align State Aid standards with MnDOT standards. It had the potential to be extremely controversial. People want their specific needs met, and balancing different interests was challenging. Cities, counties, and bike and pedestrian stakeholders, for example, had different interests. We ended up with aligned standards that gave local engineers more flexibility to use good engineering judgment in designs.

Another significant accomplishment was an overhaul of the cooperative agreement program. When local agencies made improvements that touched the trunk highway system and the local agency was the lead, they went through the same rigorous process required for any other trunk highway project, even though these State Aid projects were relatively simple. We were able to streamline the process so that a project that may have taken three years to deliver now takes perhaps a year or less. This is a significant improvement for local

Rasmussen continued on page 3



Kristine Elwood

LTAP Steering Committee welcomes new chair and members

Kristine Elwood is the new LTAP Steering Committee chair. She is assistant commissioner of MnDOT State Aid and the Statewide Radio

Communications Division.

New committee members are Jon Lennander, Rick Shomion, and Katie Walker.

Lennander, Fridley's assistant city engineer, represents the City Engineers Association of Minnesota. He succeeds Steve Lillehaug of Brooklyn Center.

Shomion is a maintenance training coordinator with the MnDOT Office of Maintenance. He succeeds Tom Peters on the committee.

Walker is the director of MnDOT's Office of Research & Innovation. She succeeds Linda Taylor, who retired.

We thank our new members for joining and our former members for their service! ■

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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Minnesota LTAP Steering Committee

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David Hann, Minnesota Association of Townships
Greg Isakson, Goodhue County; Minnesota County Highway Engineers Association
Tim Kieffer, City of Golden Valley; Minnesota Street Superintendents Association
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Lyndon Robjont, Carver County; Minnesota LRRB
Rich Sanders, Polk County; Minnesota County Engineers Association
Paul Sandy, City of Brainerd; City Engineers Association of Minnesota
Rick Shomion, Office of Maintenance, MnDOT
Katie Walker, Office of Research and Innovation, MnDOT



OPERA project: Temporary roadside turf irrigation system

Irrigating newly planted grass seed in roadside areas disturbed by construction is a common challenge for many local agencies. To address the problem, the City of Edina Engineering Department developed a temporary roadside turf irrigation system.

The City of Edina received a \$5,900 grant through the LRRB's Operational Research Assistance (OPERA) Program for the project team to develop and test the temporary roadside turf irrigation system. The team designed the system with parts readily available at most hardware retailers for less than \$200.

The City of Edina tested the system along a portion of the roadside of a smaller city road and utilities reconstruction project. Turf establishment was monitored and compared to the traditional method of irrigating with a water truck on the remaining portions of the project. The contractor was directed to water the turf areas per the specifications but to not water the temporary irrigation area.

It was assumed that testing the system on a 50-foot strip that was 5-feet wide would yield the same results when applied to a much larger area. It also was assumed that both areas were undisturbed during turf establishment and that the water for both applications came from the same source and was not contaminated during application.

The temporary system and a control plot were installed along a portion of the project that was not watered by a permanent irrigation system. City staff monitored staff time, gallons of water, and length of time to achieve 90 percent coverage with 6-inch turf grasses.

The City of Edina intends to share the design, installation, and use of the temporary roadside turf irrigation system with other local agencies. ■

Project Leader
Chad Millner

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4801 W 50th Street
Edina, MN 55424

Phone
952-826-0318

OPERA Funding
\$5,900

Steps for creating a temporary roadside turf irrigation system

1. Identify a local water source.
2. Fabricate an irrigation system with common parts.
3. Set it, relax, and watch the grass grow.



GO TO MNLTA.P.UMN.EDU/OPERA TO WATCH A VIDEO ABOUT THE PROJECT.



Local OPERA funding available: Send us your ideas!

Funding is available from the Local OPERA Program. If you or your staff have an idea—perhaps a new tool, process, or design—and you need funding to develop it, please see the OPERA webpage to submit a proposal.

OPERA funds projects up to \$20,000 through a request-for-proposal process. Proposed projects should focus on the timely development of relevant ideas or methods that improve transportation or maintenance operations. ■

Rasmussen from page 2

agencies, and it makes it easier for them to work with MnDOT.

And day to day, a highlight was trying to help both local agencies and MnDOT see the importance of good relationships and working well together.

What would you recommend to improve state and local roads?

The next big thing is the limited-use permit process with MnDOT. Any time a local agency does a project on a MnDOT facility and the improvement includes putting a trail in MnDOT right-of-way, the local agency has to execute a limited-use permit for occupancy of that facility. If there is context in the corridor that creates the need for that trail, I feel the trail should be part of the transportation system and not a limited use.

The other big thing is finding ways to fund maintenance, operations, and reconstruction. The systems are deteriorating faster than the resources are coming in.

How can LTAP help?

In the big picture, practitioners need to know what's out there—new research and products—to stretch dollars as far as possible. LTAP is the conduit. It can help local engineers and their staff use the most current tools and technologies in an effort to be as cost-effective as possible. That's why LTAP is so important. Without it, we're missing a piece of the conduit. ■

Study determines optimal sight distances, stop-bar positions at rural intersections

To improve safety at often-dangerous rural road intersections, University of Minnesota researchers investigated drivers' ability to judge traffic speed and gaps between cars at varying sight distances. Using a state-of-the-art driving simulator, the researchers showed that 1,000 feet of sight distance allows drivers to make better crossing decisions.

"We've known that sight distances were factors in rural intersection crashes," says Tracey von Bargen, county engineer for Grant County. "This study gave us the hard data showing how long sight distances should be to allow drivers sufficient time and space at rural thru-stop intersections."

The need for this project was pressing because four-way intersections carry inherent safety risks for drivers. From 2008 to 2012, nearly 42 percent of severe crashes occurring at Minnesota intersections resulted in serious injuries and fatalities, and crashes are often most severe at unsignalized rural intersections.

"Drivers on minor roads seeking to cross must determine when traffic gaps are sufficient to cross and can misjudge the time-to-collision," says Nichole Morris, director of the U of M's HumanFIRST Laboratory. "Limited visibility has been associated with drivers choosing insufficient gaps, so we wanted to determine the optimal sight distance at four-way intersections. This will maximize driver safety, reduce injuries, and save lives while potentially reducing unnecessary clearing of trees and brush at intersections."

Study results show that 400- and 600-foot sight distances are insufficient for drivers to make good crossing decisions. The 1,000-foot sight distance and slower speeds (55 mph) allowed drivers to judge time-to-collision more effectively and respond to cars at minor thru-stops intruding into the mainline. "This means that drivers could effectively respond to a car running a stop

sign—often a catastrophic crash scenario," Morris says.

Finally, researchers discovered that when mainline drivers noticed a thru-stop car waiting closer to the intersection, they reduced speed more than for a car stopped farther back. Therefore, moving the stop bar on minor roads closer to the intersection could both increase the sight distance for the waiting driver and slow driver speeds on the mainline—an inexpensive change with potentially significant benefits.

"Agencies could use the 1,000-foot sight distance and our other findings for guidance," Morris says. The project was funded by the LRRB. ■



A moving pickup truck crosses the participant vehicle in a sight estimation test at the U of M lab.

ROAD SALT

Environmental leaders honored for salt reductions

The Freshwater Society presented four Environmental Leadership Awards at the Road Salt Symposium held on October 29. This was the second offering in 2019 of the annual symposium, which has usually been held in February. Based on participant feedback, event organizers determined that October is the best time of year for the symposium and began the transition by holding a second event this fall. The fall award recipients are Mayo Clinic Grounds Maintenance (see article on p. 1), Douglas County Public Works, the City of Edina Engineering Department, and MnDOT's Road Weather Technology Team. Highlights from the recipients' submissions follow.

Douglas County Public Works

Douglas County does not have a bare pavement policy. The county will clear the roads enough so they are safe for motorists but avoids using the amount of salt needed to achieve bare pavement.

Steve Johansen is the maintenance superintendent at Douglas County public works in Alexandria. He has been with Douglas County for two years, and in coordination with his employees and public works director, has taken the salt reduction program to the next level.

When Johansen joined the county, it was already using a drip system on the sander plates, which helps keep the material on the road. Johansen then had all the sanders calibrated. He installed the latest sanding controllers and GPS in the new trucks, which also have ground speed controllers to keep the application rates efficient but not extreme.

The county also purchased a brine-making system and set up its water truck and water tank trailer with a brine application spray bar for anti-icing. Johansen has also added brine application systems in three pickups for pretreating in the outer parts of the county.

As with any new initiative, educating the operators is key to success. As their supervisor, Johansen

made his expectation of reduced salt use clear. He found the operators were more than willing to join the effort, which was also a priority for county commissioners.

The winter of 2019 was challenging in Douglas County. There was a lot of snow and a lot of wind. Despite the tough conditions, the county used 30 percent less salt with few complaints from residents. Johansen intends to continue the program this winter and send more operators through training.

City of Edina Engineering Department

The city has been supporting regulatory controls, building knowledge, and investing in technology and tools.

Edina was the first city to pass a Resolution of Support for limited liability legislation. Private and public winter maintenance providers face different barriers when it comes to using less salt. Through hosting training events and talking to private applicators, it became apparent that risk allocation played a large role in decisions about salt use and selection of best practices.

City staff were also engaging with local Master Water Stewards who were particularly concerned about chloride pollution. Through an idea initiated

and championed by local Master Water Stewards, a Model Contract for Snow and Ice Management was developed. The city convened a diverse advisory committee of service providers, property managers, and other interested representatives to develop a model contract that embraces best practices to minimize environmental impacts from sand, chlorides, and other chemicals while also maintaining safety and addressing liability risk allocation.

The city was also part of the push to create a collection of model ordinances for cities to use regarding chloride pollution. These ordinances were created along with the MPCA, Nine Mile Creek Watershed District, and several other cities and watershed organizations and include topics such as required training for winter maintenance professionals, salt storage regulations, chloride management plan requirements, and sweeping regulations for excess deicers.

In another effort, the City of Edina partnered with researchers at the University of Minnesota to study adaptive management for deicing operations. The study, which is in its final stages, was funded by the Local Road Research Board. The project included workshops with operators where researchers provided data, empowering operators to use that

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Mayo from page 1

of choice, but environmental, infrastructure, and financial concerns have begun to cause maintenance crews to consider alternatives.

"Paved surfaces keep growing," said Nick Queensland, grounds maintenance supervisor at the Mayo Clinic and a presenter at the Road Salt Symposium in October. "That is one of the things that kind of spurred our salt reduction efforts. If we just kept going the way things were going, the snow budget kept going up."

Though the Mayo Clinic is a private entity, the process Queensland and his crew went through to reduce salt usage could be applied almost anywhere—private and public sectors both. It also wasn't revolutionary or expensive, he said; it was

mostly a matter of putting in the effort to plan carefully and communicate.

Pre-planning

Queensland knew he couldn't simply jump in and cut Mayo Clinic's salt usage without doing some initial planning. "From my experience," he said, "if you're going to make a big change, and the change is going to last, it's got to be incremental. You've got to get buy in."

For the first year, he spent his time simply observing the snow removal process at the clinic, noting how the contractors worked and where excessive salt was causing damage to the campus green spaces and infrastructure. During the 2017–2018 winter he started cutting back on salt, but he was more or less alone in the matter and found it difficult to change the practices of contractors half-way through the season.

As he researched the problem, Queensland happened across the Minnesota Pollution Control Agency's Smart Salting training program, and this changed the situation significantly. His snow removal crews and leadership became Level 1 certified, and with everyone finally on the same page, "ideas were flying," he said. They learned to coordinate contractors well in advance—as early as July—and started experimenting with alternatives to salt.

Practices

No single method proved effective on its own; salt reduction involved many little projects that had a big effect when taken together. In one instance, Queensland took note of a particularly nasty stretch of stairs where frequent foot traffic made it necessary to heavily salt. In response, Queensland set up a \$20 sign that warned visitors of icy stairs.

"That paid for itself," Queensland said. Accidents at that spot fell to zero that winter, and maintenance crews saved around \$20 in salt per snow event.

Queensland and his crew experimented with brine, which proved effective at clearing roads, though not sidewalks. They also had their contractors calibrate their salt spreaders so that they put out salt at a consistent, calculated rate, and the crews began spot-salting rather than blanket-covering the entire campus.

Results

The results from Queensland's efforts have been significant.

"Last year we were able to reduce our salt usage by 60 percent in one year," he said. Mayo Clinic data monitoring falls on the campus showed no significant differences from the 2016–2017 to 2017–2018 winters. Queensland could not speak as to the exact dollar amount that the clinic saved on salt, but the money did come back to his crew and they were able to buy two new snow blades, a used pickup truck for their brine sprayer, and a new sidewalk machine.

"Nothing revolutionary, nothing expensive," Queensland said. "It took effort." ■

—Sophia Koch, LTAP freelancer



Salt brine proved effective at clearing roads but not sidewalks.

ACCIDENTS FELL TO

ZERO

after crews installed a
\$20 SIGN
warning visitors
of icy stairs.

New Hampshire highway expansion stirs controversy over road salt

Interstate 93 runs from downtown Boston and through most of New Hampshire before ending in northern Vermont. It's a crucial corridor for Boston-area tourists to access the ski hills of New Hampshire's White Mountains in the winter and the state's lakes region in the summer. Tourism is an important part of New Hampshire's economy, but the Boston metro area has more than 5 million people, while the entire state of New Hampshire has a little over one million. This means a lot of vehicles on I-93 during peak times.

The highway was designed, in 1962, for up to 70,000 vehicles per day. In 1997, over 100,000 vehicles rumbled down the interstate on an average day. By 2020, the number is estimated to reach 140,000. The New Hampshire Department of Transportation (DOT) decided it had to do something.

More road, more salt

To deal with the increased traffic, the NHDOT wants to expand the highway from two lanes to four lanes, going each way, from the Massachusetts border to Manchester, NH. In addition, it wants to widen on- and off-ramps and add more park-and-ride lots. Total proposed cost: \$750 million.

Ted Diers, watershed management bureau administrator at the New Hampshire Department of Environmental Services, gave his inside perspective on this project, and what growth and development mean for road salt management, at the Road Salt Symposium in February. "This is going to be the largest infrastructure project in New Hampshire history," he declared.

All of this, of course, would mean more pavement that would need to be maintained during icy winters, which would mean more road salt. With water quality in mind, many were quick to object to the plan.

Opposition rises

When planning for the highway expansion began in the 1990s, the first step was an environmental impact statement (EIS). The EIS came back with some sobering results: New Hampshire had a chloride pollution problem, and the project would make it worse.

There are at least 44 impaired water bodies for chloride statewide, including four in the I-93 expansion area. And similar to parts of Minnesota, this region of New Hampshire has glaciated topography, so it takes at least 20 years for water to flow through the surficial groundwater system.

"So what we're actually seeing in the water is what happened 20 years ago," Diers explained. This

means that the salt added now won't show up in the water for many years.

The Federal Highway Administration, from which the NHDOT needed to get approval for their project, saw the problem in the EIS. They said New Hampshire had to take an "adaptive management approach." The DOT would be allowed to build one of the extra lanes, but it couldn't build the second one until certain water quality conditions were met.

Diers' agency, the state's Department of Environmental Services, was tasked with coming up with a plan. It decided that the DOT would have to fund a clean-up report, establish an implementation plan, and then implement the plan. The plan would have to mandate no additional loading of chloride, offset by reductions in the private sector and municipalities.

The clean-up report concluded that in order to get the new second lane, the DOT would have to reduce its chloride pollution by 12 percent. In 2007, it started construction on the first new lane. The DOT says it reduced its salt use by 25 percent thanks to a switch to more brine and other changes, but it has yet to make a decision on the second lane.

Looking ahead

The problem now, says Diers, is the private sector. "We have to change this culture that if it crunches it's good," he emphasized. "People have come to associate piles of sidewalk salt with safety, but in reality it's overkill."



The highway expansion is meant to accommodate more growth and development, which is great for the state's economy and residents, but not so great for salt and chloride levels.

"If you build a bigger highway, guess what? You can put more people in it. If you put more people in it, then you can start to develop more of the land around that highway. And then you're going to build more development, and secondary development from that, and induce development out beyond that," Diers said.

"As a society, we do not yet have the gumption to be able to tell people, 'you can't build that next box store. You can't build that next parking lot, that next job creator,' because of salt or any other pollutant. We're just not there," he added. "We may have the legal ability to do it, but society is just not there. But I think that that's coming. I think that as the population starts to see these issues, and they see their lakes getting polluted, and they see the fishing get bad, and they see the cyanobacteria behind their house in the storm drain, they're [going to] demand action. It would be better to reduce salt use now to avoid those difficult decisions down the road."

Only time will tell. ■

—Paul McDivitt, LTAP freelancer

Awards from page 4

information to inform their own operations. The conversations also led to some creative ideas about storage, equipment, data availability, and accountability. One outcome of the workshops was a recommendation to experiment with articulated plow blades, hypothesizing that they would be more effective at physical removal of snow and ice, requiring less salt. These were installed on several trucks this past winter with the support of operators.

MnDOT Road Weather Technology Team

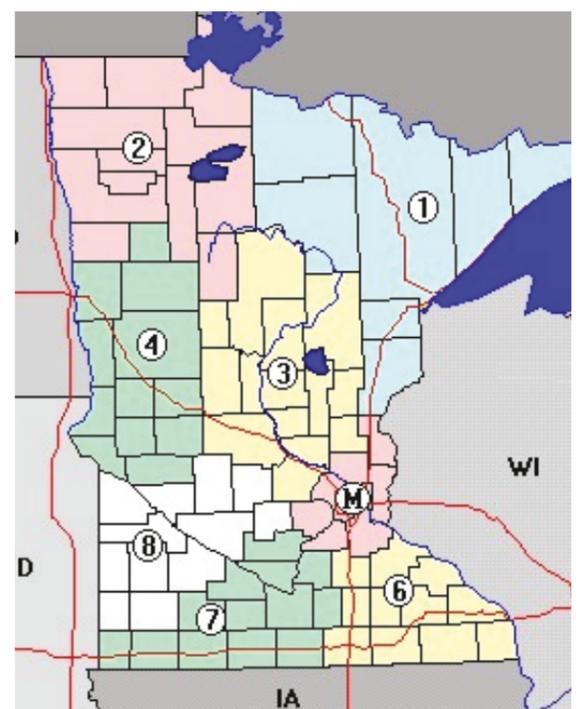
The team's responsibilities include Road Weather Information Systems (RWIS), Automated Vehicle Location Systems (AVL), a Maintenance Decision Support System (MDSS) Salt Sustainability Project, Pathfinder, and numerous other projects associated in and around these programs.

MnDOT has moved forward with innovative applications such as WebMDSS™. MDSS has been a valuable tool in predicting weather and road conditions and providing operations with a recommendations tool for better decision making within a given

winter event.

MnDOT, along with its contracted weather provider, Iteris, has developed a matrix within the MDSS application. This matrix helps disseminate the department's usage data alongside recommendations for MnDOT operations. This tool has provided MnDOT with a sustainability goal measure to help determine areas that need improvement.

MnDOT's RWIS website—rwis.dot.state.mn.us—has links to WebMDSS and other resources. Users are required to log in to the tool. Please contact Joe Huneke for details (651-366-3586, Joseph.Huneke@state.mn.us). ■



Users can click on an area to view the available RWIS data.

WORKFORCE DEVELOPMENT

Roads Scholars: Where are they now?

What paths have Roads Scholars taken since graduation? In this issue we hear from Grant Riemer, City of Ramsey Public Works superintendent and a 2017 Roads Scholar. He has also served as president of the Minnesota Fall Maintenance Expo.

What got you interested in your field?

I had a close friend that worked for the Coon Rapids Public Works department and at the time I was working in construction, installing sewer and water main line. His job seemed interesting because he was involved in so many different things every day. He always had stories about working with the police and fire departments, snowplowing, water main breaks, etc. It just seemed interesting.

How did LTAP training help you in your work?

There are many aspects to the public works field. I had experience in the utilities area, but really nothing else. LTAP provides training in snowplowing, traffic engineering, asphalt maintenance, stormwater infrastructure, and much more. You really need training in all these areas to be proficient as a maintenance worker.

What has been the most exciting or surprising part of your work?

The most surprising part of my job is how quickly you have to be able to switch work plans. It comes as no surprise to anyone in this job that whatever you have planned for the day or week, all or part of your plan will be discarded by 8:00 a.m. that morning for a new plan. You really need to think ahead and have plans B, C, and D ready to go at any given time.

The most exciting part of my job right now is

working on the beginning stages of a new public works facility for the City of Ramsey. We have never had a building that was actually designed for our department's operations. We have operated out of a couple different locations that were available when we had to expand, but nothing actually laid out properly for our needs.

What can people learn from your path?

I will be starting my 31st year with the City of Ramsey in May 2020. I started as a maintenance worker in the parks department cutting grass and dragging ball fields. I am now the department head for the Public Works department and giving my input from a public works perspective on multimillion dollar projects. There are many directions you can take your career, and that choice is totally up to you.

What makes the Fall Maintenance Expo so popular, and why is it important to participate?

The Fall Maintenance Expo is an event held every October at the City of St. Cloud Public Works Facility. A typical year sees approximately 2500+ maintenance workers from across the state attending. The expo gives maintenance personnel the opportunity to attend educational sessions on winter maintenance and also talk with vendors displaying just about every conceivable piece of equipment on the market.

There is also a snowplow rodeo where participants can show off their driving skills. The rodeo can either earn you bragging rights at your shop for the year, or something bigger. The Fall Expo Committee, along with APWA-MN, sponsors the top two drivers to represent Minnesota at the national snowplow

rodeo in Colorado next fall.

There is also a course for skid steer or mini excavator operators (depending on the year) to show off their operating skills.

The biggest benefit of the expo is the chance to talk with other maintenance workers and exchange ideas. They just may have the answer to a problem you're dealing with back in your community. ■



Grant Riemer

Certificate from page 1

- Advanced concepts in public works operations and maintenance
- Effective creation and delivery of workplace and technical documents

The certificate is an additional level of training for Roads Scholars that requires four more training courses:

- **Writing that Works! Communication Skills for Construction.** This one-day course provides an introduction to the importance of writing and professional skills needed for public works professionals. Course emphasis is on planning, preparing, and delivering effective and clear workplace documents to communicate with the general public and elected officials.
- **Transitioning into Leadership: Essential Skills for Supervisors.** When moving from peer to manager, new supervisors face a whole new

set of challenges. This interactive workshop will teach practical, easy-to-understand, and fundamental methods to grow your leadership skills and help you become an effective leader.

- **Management Operations and Maintenance Fundamentals.** This course relates to the delivery of maintenance and operations services to the public, commonly known as public works. It will identify the equipment and personnel resources needed for efficient and effective service delivery.
- **Administration and Management Basics.** This course is under development.

Roads Scholar enrollment is free, but there is a small charge to attend individual workshops. Classes are offered at convenient locations across Minnesota to make the program easily accessible to most local agencies.

"Minnesota LTAP provides cost-effective training to local transportation and public works agencies," says Stephanie Malinoff, Minnesota LTAP director. "We're pleased to widen our curriculum with the new leadership certificate and help local agencies develop their greatest asset—their employees."

The Maintenance Operations and Technical Certificate will continue to give local transportation personnel the opportunity to improve their road and bridge maintenance skills. Participants learn proven techniques as well as how the latest technologies and innovations can be applied to their particular maintenance problems. Students who earn eight credits from the maintenance operations category of LTAP courses receive this certificate. ■

Roads Scholars honored at maintenance expo



At a ceremony held as part of the Minnesota Fall Maintenance Expo in St. Cloud, LTAP presented certificates to three recent Roads Scholar grads.

Left to right: Alvin Pederson, Otter Tail County; Justin Sorensen, City of Waconia; Eric Geyen, City of Waconia. ■

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.

Evaluating Integrated Roadside Vegetation Management (IRVM) Techniques to Improve Pollinator Habitat (Maryland DOT, July 2019)

Identifies which tactics maximize quality floral resources for pollinators in the Northeast and assesses how those different regimes affect regional bee populations.

Using Sonar and Unmanned Surface Vessels to Monitor Bridge Scour (Michigan DOT, July 2019)

Investigates various techniques to monitor bridge scour during high-flow events.

Aging Effects on Asphalt (Illinois DOT, Aug. 2019)

Investigates flexibility characterization of a wide range of plant- and lab-produced surface mixtures using various aging techniques under different conditions.

Preservation and Maintenance on Flexible and Rigid Pavement (USDOT, July 2019)

Quantifies sustainability impacts of preservation activities for pavements and describes a methodology that may support making project-level decisions in between various preservation and rehabilitation activities.

Calculating Energy Consumption of Pavement Preservation and Maintenance (USDOT, July 2019)

Describes models for the use stage and work zone of life-cycle assessment on

pavement preservation and maintenance schedules.

Development of a Life-cycle Assessment Tool for Pavement Investigation of Tack Coat Materials Tracking Performance (Wisconsin DOT, July 2019)

Provides recommendations to modify the exiting tack coat specification in Wisconsin.

Evaluation of Recycled Base Aggregates (Wisconsin DOT, July 2019)

Analyzes the performance of base layers created from recycled materials.

Optimizing Design of Low Volume Roads (National Center for Asphalt Technology, June 2019)

Examines pavement design and asphalt mixtures for low volume roads.

Design and Evaluation of a Connected Work Zone Hazard Detection and Communication System for Connected and Automated Vehicles (CAVs) (Virginia Tech Transportation Institute, Aug. 2019)

Predicts collision threats in work zones.

Innovative Coating Removal Techniques for Coated Bridge Steel (Virginia DOT, Aug. 2019)

Determines whether laser ablation is an acceptable alternative for removing existing coatings.

Increasing Safety of Child Pedestrians

(Upper Great Plains Transportation Institute at North Dakota State University, July 2019)

Identifies locations in urban areas where child pedestrians are at particular risk for fatal collisions with vehicles and determines ways to mitigate these risks.

Cloud-Based Dynamic Warning System (MnDOT, June 2019)

Develop a system to expand the safety improvement potential of a dynamic curve speed warning system that can be implemented systemwide to all reduced speed curves without infrastructure investment.

Debonded Strands in Prestressed Concrete Bridge Girders (MnDOT, July 2019)

Explores using debonded concrete on bridge girders.

Cost/Benefit Analysis of the Effectiveness of Crack Sealing Techniques (MnDOT, June 2019)

Compares clean-and-seal asphalt pavement crack repairs to rout-and-seal repairs and develops decision trees that allow planners and repair crews to select an appropriate repair method.

Design Standards for Unobstructed Sight Lines at Left-turn Lane (MnDOT, Aug. 2019)

Recommends general policies and guidance for designing offset left-turn lanes for a new edition of MnDOT's *Road Design Manual*.

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 ■

Recommendations are organized to provide standards, policies, and guidance for new/reconstruction projects and for preservation projects. ■

Iowa DOT releases new winter operator training videos

The Iowa DOT has released an updated series of snow and ice videos. The new series includes 13 videos and takes about 90 minutes to watch. Topics include plowing techniques, preseason prep, plow mounting, and deicing chemicals.

The old series was popular, with more than 200,000 views on the plowing techniques video alone. The new series, available on YouTube, updates those videos and uses newer technology. The free videos can be used to supplement training where needed. ■



'Raise Our Grade Minnesota' website

Minnesota's economy and our quality of life depend on sound, safe infrastructure. A new website—RaiseOurGradeMN.org—helps users contact local elected officials about investing in infrastructure improvements.

The website promises to be a valuable tool when discussing plans for highways, bridges, and other infrastructure with your boards, commissions, and constituents. Users can enter their zip code and get a report for their Congressional district.

Raise Our Grade Minnesota is an initiative of the Minnesota Chapter of the American Public Works Association and its partners. It is a nonpartisan, nonpolitical shared commitment to making infrastructure funding a priority in our state. ■



Pennsylvania saves millions with mobile construction apps

The Pennsylvania Department of Transportation (PennDOT) has saved an estimated \$39 million in overall productivity through its mobile construction app program. These savings were calculated based on time saved using apps compared to older paper and manual processes.

Program goals include increasing productivity for field staff and field consultants; transforming labor-intensive, manual paper processes through efficient mobile technology; and improving data collection and reporting capabilities.

PennDOT implemented its first app in 2013. Today, PennDOT uses nine different apps and has another two in development. The apps cover a wide range

of activities, including mobile construction documents, punch lists, concrete inspection diaries, mileage and hour trackers, and payroll.

PennDOT isn't done, either. The next step includes implementing e-ticketing, supporting maintenance systems, using radio frequency identification tags, and more. ■

Learn more:

- Every Day Counts: fhwa.dot.gov/innovation/everydaycounts



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.

WORKSHOPS & TRAINING



CALENDAR

For details and an up-to-date list of events, please see mnltp.umn.edu.

Fundamentals of Construction Inspection

Jan. 14, Duluth
Jan. 29, Bemidji
Jan. 30, Detroit Lakes
Feb. 11, St. Cloud
Feb. 18, Rochester
March 10, Mankato
March 18, Willmar
March 24, St. Paul

Extending Pavement Life through Pavement Preservation Techniques, Strategies, and Preventative Maintenance

(1 RS Maintenance credit) LTAP
Feb. 18, Rochester
March 10, Medina
Apr. 14, Baxter

Management Operations and Maintenance Fundamentals

(1 RS Leadership credit) LTAP
March 5, Medina

ATSSA Northland Chapter "How To"

(0.5 RS Maintenance credit) LTAP
March 17-18, Fargo

Seal-Coat Operations & Micro/Slurry Surfacing: A Workshop for Practitioners

(1 RS Maintenance credit) LTAP
March 25, Mankato
Apr. 1, Medina
Apr. 9, Alexandria

Gravel Road Maintenance and Design

(1 RS Maintenance credit) LTAP
Apr. 14, Crookston
Apr. 21, Rochester
Apr. 28, Brainerd

Minnesota Roadway Maintenance Training and Demo Day

(1 RS Maintenance credit) LTAP
May 7, Fergus Falls

Transitioning into Leadership: Essential Skills for Supervisors

(1 RS Leadership credit) LTAP
May 13, Brainerd

ONLINE TRAINING: Anytime, anywhere!

Math Basics for Maintenance Technicians
(1 RS Maintenance credit)

Installation and Management of Roadside Turfgrasses
(1 RS Maintenance credit)

Turfgrass Pathology Course
(0.5 RS Maintenance credit)

Culvert Design and Maintenance
(1 RS Maintenance credit) LTAP

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

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

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

Roads Scholar credit

You can earn credits in Minnesota LTAP's two Roads Scholar (RS) certificate programs by attending LTAP and CTAP workshops and other cosponsored events. To learn more or enroll in the program, visit mnltp.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: mnltp.umn.edu. To be added to our print or electronic mailing lists, email 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 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.

New CDL license requirements coming in February

New rules are coming into effect for entry-level truck driver training in February 2020. The changes will affect drivers who want to get a commercial license (CDL) for the first time or upgrade their license.

The new rules were announced earlier this year by the Federal Motor Carrier Safety Administration (FMCSA). Drivers don't need to reapply if they already have a CDL before the compliance date comes into effect on February 7, 2020. After that date, drivers will take the revised training to apply for any kind of a commercial vehicle license.

The rules established new minimum training standards for individuals applying for these licenses:

- A Class A or Class B commercial driver's license for the first time

- An upgrade of a CDL (e.g., a Class B CDL holder seeking a Class A CDL)
- A hazardous materials (H), passenger (P), or school bus (S) endorsement on a driver's CDL for the first time

These individuals are subject to the new requirements and must complete a prescribed program of theory (knowledge) and behind-the-wheel instruction provided by an entity that is listed on FMCSA's Training Provider Registry. ■

Learn more:

- FMCSA Entry-Level Driver Training: fmcsa.dot.gov/registration/commercial-drivers-license/eltd

MARK YOUR CALENDAR:
Minnesota Roadway Maintenance Training and Demo Day
MAY 7, FERGUS FALLS

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

It's never too late to brush up on your winter skills. 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. ■

Test Question

If you hold a CDL, is an inspection of your truck required before you use it each time?

- A. Yes
- B. No
- C. Only if it is snowing
- D. Only if I have a passenger