COVID-19 safety practices: every day, everywhere

Now more than ever, keeping safety in mind is essential during the work day. Several organizations have compiled COVID-19 guidance for what you should do in vehicles, work zones, and elsewhere, and we share some top practices inside. Please see the Minnesota LTAP Workplace Safety web page for links and additional resources. And please stay safe!

A new view for traffic analysis

The use of unmanned aerial systems (UAS), commonly known as drones, is one of the fastest growing techniques in the transportation industry. Some of the more common uses for UAS are to monitor and inspect construction projects, supplement bridge inspections, and perform emergency response and vehicle crash assessment.

One of the emerging uses of UAS is in traffic analysis, where an aerial vantage point can help agencies monitor traffic patterns, gain insight on driver behavior, and collect traffic data. This article discusses three demonstrations performed by Josh Campbell (a civil engineering student at Alabama University in Huntsville) while working for Washington County, and Joe Campbell (local programs engineer with the FHWA’s Minnesota Division and an LTAP Steering Committee member) during the summer of 2019.

Traffic data collection in Washington County

While working as a traffic technician for the Washington County, Minnesota, public works department, Josh Campbell developed an idea that a UAS could assist in the collection of traffic data. He also thought that first-person vision (FPV) goggles, slow down. Pay attention. Save Lives.

‘Road Workers are Sitting Ducks’ safety campaign

Speeding and distracted drivers put the lives of highway construction and other road workers at risk every day. In Minnesota between 2015 and 2019, 46 people died and more than 4,200 were injured in work-zone traffic crashes.

To raise awareness of this danger, a Minnesota-specific version of the National Work Zone Safety Awareness Week campaign is hitting the airwaves this summer. The campaign features an attention-grabber—Ben Afquack, also known as the ‘Minnesota Duck’—to get across this very serious message.

Drones continued on page 6

Road Workers Are Sitting Ducks


‘Road Workers are Sitting Ducks’ safety campaign

Read the Exchange online for links to publications and other resources.
DITCHES & RUNOFF

Are you maintaining your ditches properly?

Ditches are an important component of many rural roads in Minnesota. They are designed to drain water away from the road, so their proper maintenance is essential for preserving the roadway structure and keeping harmful runoff out of our waters.

According to retired Crow Wing county engineer Duane Blanck, the best way to know if ditches are functioning properly is to observe and inspect them, especially during and after rain or snowmelt events when higher flows exist. Three critical elements or conditions suggest ditch problems: road appearance, ditch erosion or soil instability, and water flow.

Common routine maintenance problems include correcting sediment buildup to restore water flow, replacing damaged culverts, and managing vegetation. Maintenance staff can generally complete routine maintenance without major analysis or engineering, Blanck says.

Managing vegetation includes mowing, brushing, tree removal, and spraying. All of these areas are regulated by state statutes or rules and even federal regulations, he says.

Bigger problems or those requiring frequent routine maintenance to keep a ditch functional may require a redesign and reconstruction to reduce such maintenance. Such work typically requires professional analysis or engineering and possibly one or more permits.

Maintaining personnel should always clean up the work site after completing a ditch maintenance project, Blanck adds. Leaving debris can undermine ditch maintenance efforts and eventually lead to more problems. Spoil piles, cut brush, tree trimming debris, or other unattractive reminders of ditch maintenance should be cleared away.

It’s important to maintain a maintenance record for defense of legal claims and to provide evidence in the use of right-of-way. Blanck also advises agencies to request assistance from their local Soil and Water Conservation District or other appropriate authority before beginning any work, especially if there are questions. Permits may be needed if the ditch discharges to a special or impaired water, for example, or if it runs through a wetland.

An excellent resource on ditch maintenance is the Field Guide for Maintaining Rural Roadside Ditches. The guide and other resources, such as downloadable checklists for maintenance tasks, are on the Minnesota Sea Grant’s Maintaining Roadside Ditches website.

Learn more:
- Maintaining Roadside Ditches, Minnesota Sea Grant: seagrant.umn.edu /coastal_communities/ditches

Goat grazing helps control buckthorn growth

U of Minnesota researchers fed buckthorn fruits to goats and recorded how many seeds passed through their digestive tracts intact and able to grow. Their work shows that goat grazing is an effective way to destroy the seeds.

Goat grazing to remove invasive species has become an increasingly popular practice among Midwestern landowners. At the same time, there’s concern the goats may be spreading the invasive species they’re eating through their feces.

The study was inspired by questions from residents who had been carefully observing goat behavior during projects in public St. Paul parks. The study found:
- Two percent of buckthorn seeds passed through goat guts intact.
- Of the seeds that appeared in the goats’ feces, 11 percent were still viable.
- For comparison, 63 percent of seeds that had not been eaten by goats were capable of growth.

Funding for this project was provided by the Minnesota Invasive Terrestrial Plants and Pests Center through the Environment and Natural Resources Trust Fund as recommended by the Legislative- Citizen Commission on Minnesota Resources.

(Reprinted from a University of Minnesota Research Brief, Apr. 7, 2020.)

Learn more:
- Goat digestion leads to low survival and viability of common buckthorn (Rhamnus cathartica) seeds (Natural Areas Journal, Apr. 6, 2020)

Managing stormwater runoff: ditch checks, bioswales, sediment control logs

Managing stormwater runoff from roadways is a top regulatory and environmental concern for highway departments. In recent months, projects by University of Minnesota researchers have led to new guidance for ditch checks, bioswales and sediment control logs.

In one project, researchers documented the performance of an iron-enhanced ditch check filter to remove phosphates from stormwater. They found that the filter was effective, though its performance decreased over time. The project was funded by MnDOT and the LRRB.

In a MnDOT-funded study, researchers studied the use of previously discarded natural materials close to construction sites for stormwater management. They found that MnDOT could use onsite soil to build bioswales and bioswales to retain the first inch of roadway runoff and associated pollutants—with tremendous cost-saving potential.

Another MnDOT-funded project developed two new decision tools—one for ditch checks and one for perimeter control—to guide the selection of sediment control logs. Researchers also adapted the results of the innovations into a set of training materials for erosion control and stormwater management.

Learn more:
- Iron-Enhanced Swale Ditch Checks for Phosphorus Retention (MnDOT and LRRB, 2020)
- Development and Regionalization of In Situ Bioswales and Bioswales (MnDOT, 2019)
- Sediment Control Log Performance, Design, and Decision Matrix for Field Applications (MnDOT, 2019)

Goat digestion leads to low survival and viability of common buckthorn (Rhamnus cathartica) seeds (Natural Areas Journal, Apr. 6, 2020)

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 states 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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Asset management guide addresses needs of local agencies

The LRRB has published a new guidebook to help local agencies get started on developing a consolidated asset management system. The guide addresses the particular needs of smaller groups to effectively and optimally manage their roadways, buildings, vehicles, equipment, and other assets.

The Asset Management Guide for Local Agencies describes transportation asset management (TAM) and its benefits. The guide also presents the particular concerns of local agencies, emphasizing the need for support throughout an organization for TAM to work. “Effective implementation of asset management requires buy-in from all levels and often requires a cultural change within the organization;” says Michael Marti, principal with SRF Consulting and the project’s principal investigator. The guide promotes the use of a project champion—someone to oversee the process—and stresses the need for open lines of communication.

Other topics addressed include special software programs and agency needs, the benefits of life-cycle cost analysis, and risk management. The guide also lists the signs that implementation is successful, such as time savings, cost reductions, and delayed capital expenditures.

“This project has produced a comprehensive guide that government agencies can use to clear the hurdle of getting started with asset management;” says Lyndon Robjent, county engineer of Carver County and a member of the Minnesota LTAP Steering Committee. “The companion PDF allows users to interactively navigate report content to find information that they need.”

Learn more:
- Asset Management Guide for Local Agencies (LRRB/MnDOT, 2019RIC06)
- Local OPERA funding available: Send us your ideas!

Funding is available from the LRRB’s Local Operational Research Assistance (OPERA) Program. If you or your staff have an idea and you need funding to develop it, please see the OPERA web page to submit a proposal: mnltap.umn.edu/oppera.

GIS tools and apps—integration with asset management

In this LRRB/MnDOT-funded project, researchers gathered information about the use of GIS mobile technology by Minnesota local agencies. They also reviewed selected mobile technologies. Using this information and the results of extensive interviews with selected local agencies, the research team developed three case studies that offer recommendations for agencies at different stages in the use of GIS for asset management:

- Case Study 1: Getting Started
- Case Study 2: Utilizing Mobile Technology for Asset Management
- Case Study 3: Moving Beyond “What and Where” to Analysis and Forecasting

Learn more:
- GIS Tools and Apps—Integration with Asset Management (LRRB/MnDOT, 2020RIC15)

MINNESOTA TECHNOLOGY EXCHANGE
LRRB SPOTLIGHT
June 2020

OPERA project: side-dumping plow truck

Nicollet County Public Works staff adapted a Mack Super Truck from its usual winter snowplow configuration so that it can also haul a much larger side-dumping trailer in summer.

Increased hauling capacity

The county received a $20,000 OPERA grant to find a way to connect a side-dumping trailer to a universal plow truck chassis and use it to increase the agency’s legal load capacity. County public works staff had discovered that a side-dumping trailer could haul more than twice as much as a conventional dump box. But, to make it work, they needed a side-dumping trailer compatible with the hydraulic pump used for snowplow equipment on the Super Truck. Maintenance staff spent many hours of research before settling on the purchase of a Trail King side-dumping trailer.

A conventional tandem dump body can haul 9.5 tons, but the side-dumping trailer routinely carries 20 tons, and up to nearly 23.5 tons when using special overweight permits available from the state.

Improved maintenance team efficiency

The Nicollet County team quickly found the vehicle was good for hauling more than just gravel as initially intended. In fact, the combination has become one of its most-used pieces of equipment, primarily because it has increased productivity without increasing the size of its maintenance crew. “For us as a government agency, to use a side dump to be more efficient definitely has an impact for us as well as the public’s perception,” says Lyndon Robjent, project champion—someone to oversee the process—and stresses the need for open lines of communication.

For effective implementation of asset management requires buy-in from all levels and often requires a cultural change within the organization; “the companion PDF allows users to interactively navigate report content to find information that they need.”

Learn more:
- Asset Management Guide for Local Agencies (LRRB/MnDOT, 2019RIC06)
- Asset Management Framework for Local Agencies (LRRB/MnDOT, 2020RIC15)

“LTAP’s OPERA grant has been very beneficial for us because it gives us the opportunity to think outside the box, to really change the way we do things to become more efficient.” — Mike Suska, Nicollet County Public Works

GO TO MNLTAP.UMN.EDU/OPERA TO WATCH A VIDEO ABOUT THE PROJECT.
**Vehicles and other equipment**

The COVID-19 virus has been shown to persist on surfaces for hours or days, so it is essential to clean and disinfect vehicles and equipment. A “Tailgate Talks” fact sheet (from New York LTAP) describes what to do at the end of a shift to make sure department vehicles are clean and disinfected:

- **Give the interior a basic cleaning.** Remove all personal items and trash and wipe away any dirt from the day. Have a small plastic bag in the truck where you can toss garbage to make clean-up easier.
- **Sanitize the interior using only approved sanitizing agents containing alcohol (70%) or bleach.** Starting with the interior, use wipes or spray clean the following:
  - Steering wheel and dashboard
  - Radio/climate control and center console
  - Seat belt and seat belt attachment point
  - Shifter
  - Review mirror
  - Inside door panel
- **Clean the last points of contact on the truck: the inside and outside door handles.**
- **Disinfect keys and any doorknobs.**
- **Similarly, clean any tools, toolboxes, or equipment used that day.**
- **Dispose of used cleaning materials such as wipes or rags.**

**Work zones**

A video from the American Road & Transportation Builders Association (ARTBA) provides guidance for stopping the spread of infectious diseases in work zones. It is based on recommendations from the CDC, US OSHA, and industry sources. Tips include:

- **Screen employees as they enter the work site.**
- **Keep meetings short and use alternative communication tools.**
- **Take turns viewing documents.**
- **Stagger shifts and break times.**
- **Restrict access to confined spaces.**
- **Provide hand-washing stations when possible, separated from porta-potties and break areas.**
- **Sanitize all shared surfaces—such as steering wheels, knobs, and levers—after each use.**
- **Change clothes before and after work and keep the two sets separated.**

**Buildings**

The Centers for Disease Control and Prevention (CDC) encourages these hygiene practices:

- **Wear disposable gloves to clean and disinfect.**
- **Clean surfaces using soap and water.**
- **Practice routine cleaning of frequently touched surfaces: tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, sinks, etc.**
- **To disinfect, clean the area or item with soap and water or another detergent if it is dirty. Then, use a household disinfectant. Use diluted household bleach solutions if appropriate for the surface. Alcohol solutions with at least 70% alcohol may also be used for disinfecting. Leave the solution on the surface for at least 1 minute.**
- **Never mix household bleach with ammonia or any other cleanser.**

**WHAT TO DO**

The Associated General Contractors (AGC) of Minnesota also recommends these practices:

- **Replace cabin air filters if you suspect they have been exposed or compromised by a sick employee.**
- **Don’t use other workers’ phone, tablets, devices, workstations, offices, tools, and equipment, including personal protective equipment (PPE).**
- **Disinfect reusable supplies and equipment.**
- **Dispose of used PPE properly.**

Afquack:

Afquack is a social media star. A video of him drumming with his webbed feet on a snare got millions of views on Facebook, and he has more than 72,000 Instagram followers. The companion of St. Paul’s Derek Johnson, Afquack goes on adventures all over the Twin Cities and was mobbed by fans at the St. Paul Winter Carnival this year. Johnson volunteered to appear in the series of “sitting duck” public service videos and photos to remind drivers to slow down, pay attention—and save lives.

The campaign’s development was led by the Minnesota Network of Employers for Traffic Safety (MN NETS) and the Minnesota Safety Council. To guide development, the two organizations formed a steering committee composed of representatives of the Minnesota Toward Zero Deaths program, Citizens for Safe Work Zones, and public and private organizations with employees who work in work zones.

Organizations from around the state regularly contact MN NETS to discuss the need to increase awareness for work-zone safety. “The reasoning is quite simple,” says Lisa Kons, traffic safety programs manager with the Minnesota Safety Council. “Their employees—law enforcement, emergency medical services, tow truck operators, utility and road construction workers—are being killed and injured.”

One organization, she says, relayed this: “Some of our employees would rather deal with live voltage daily than have to work in a work zone near speed and distracted drivers.”

The “Sitting Duck” campaign will be shared through TV, social media, and more. An employer toolkit includes videos, posters, and social media templates. For more information and to obtain materials, visit minnesotasafetycouncil.org/nets/Workzonesafety.cfm.
Roadside turfgrass: new resources for installers, homeowners

In recent years, new salt-tolerant sod mixtures for turfgrass, primarily consisting of fine fescues, have been developed by University of Minnesota researchers in collaboration with MnDOT and the LRRB. Unfortunately, these new mixtures did not succeed as well on roadways as predicted, often times because of watering practices.

In the latest project, funded by the LRRB, researchers studied ways to water new roadside installations more efficiently so that turfgrasses, especially the new salt-tolerant mixes, establish more successfully without wasting water. The result is a workable alternative for watering roadside turfgrass installations. The researchers also developed unique educational materials on roadside turfgrass management for both installers and homeowners.

Recommendations for irrigation, nozzles

The project began with the design and preliminary evaluation of alternative watering systems. Next, researchers evaluated these new watering methods on roadside research sites. They tested four drip-tape-style irrigation systems placed both above and below sod, two above-ground sprinkler system configurations, and eight types of water-truck nozzles. They also compared them to current watering techniques.

“We found that a non-permanent irrigation system using water from a fire hydrant was the ideal approach for watering roadside turfgrass,” says Professor Eric Watkins of the Department of Horticultural Science, the principal investigator and a member of the US Turfgrass Science Research Team.

They found few differences in germination rates, coverage, or turf quality between the 12-inch (30.5-cm) and 18-inch (45.7-cm) irrigation tape or when the tape was laid above the sod or germination blanket or below.

For sites where contractors use a hydrant adapter with a programmable irrigation system, the team recommends using the 18-inch irrigation tape laid above the germination blanket (when seeding) or above sod. The use of an 18-inch tape placed above the turf surface was easier and cheaper to install and could be removed and possibly reused after establishment. It will result in reduced water use and better establishment, Watkins says.

For sites where an irrigation system is not viable and water trucks are needed, the two nozzles that show the most promise for efficiently irrigating roadways are the Niece fan nozzle and the Pancake adjustable nozzle.

Online course for turfgrass installers

As part of the research, the team created an online course for contractors and other personnel. The course includes results from this project and previous MnDOT-funded projects. Modules address basic turfgrass management and installation-specific issues. Students earn one credit toward Minnesota LTAP’s Roads Scholar Maintenance Certificate.

“We anticipate this course will serve as an excellent continuing education opportunity for roadside turfgrass installers for years to come,” Watkins says.

Homeowner education website

The team also developed and added an entirely new section to its Roadside Turf website specifically for homeowner education. The section addresses common homeowner mistakes such as improper watering, mowing, fertilizing, and weed control. Homeowners can follow the lessons sequentially or go to individual lessons on a single topic. The lessons have topic overviews, numerous videos, and other resources.

The lesson on maintaining boulevard turfgrass includes a video developed by the LRRB and SRF Consulting called Growing Green Grass Along Your Street: How to Maintain Residential Boulevard Turfgrass. The video is one of three informational tools created in an LRRB-funded project last year; the others are a two-page flyer for residents and a detailed guide for agencies and contractors.

Learn more:

• U of M Roadside Turf website: roadsided turf .umn.edu

• Expanding the Success of Salt-Tolerant Roadside Turfgrasses through Innovation and Education (LRRB, 2020)

• Installation and Management of Roadside Turfgrasses Course: extension.umn.edu /event/roadside-turfgrass-installation-and-management-online

• Homeowner Education page: roadsided turf .umn.edu/homeowner-education

• Best Practices for Boulevard Turf Design and Maintenance project page, with links to a video, two-page flyer, and guide (LRRB, 2019)

OPERAt-funded project tests turfgrass irrigation system

The City of Edina Engineering Department received a grant through the LRRB’s Operational Research Assistance (OPERA) Program to adapt and test a temporary roadside turf irrigation system designed by U of M researchers.

The spark for the project was when Edina senior engineering technician Derek Northenscold shared his ideas for turfgrass irrigation at an LRRB meeting, where he connected with U of M turfgrass researcher Eric Watkins. Watkins described a University-developed system that uses PVC pipes, soaker hoses, and a faucet timer. The Edina project team assembled the system with parts readily available at most hardware retailers for less than $200.

With last year’s wet fall, the city did not see a difference in turf establishment between test and control sections. “We are looking to test the system again this year,” Northenscold says. Go to mnltap.umn.edu/opera to read a fact sheet or watch a video about the project.

The City of Edina also created a video about the turfgrass irrigation project, and Minnesota LTAP’s own Mindy Carlson was featured. “The project is a great example of the innovative solutions and great work that Minnesota cities and counties are delivering for,” says Carlson, LTAP’s program director, in the video. “OPERAt was created to fund smaller projects whose ideas usually stem from transportation workers out in the field who solve everyday problems with innovative solutions.”

The system is expected to cut water use and reduce water use—and cut costs. Watch the short video at youtube .com/watch?v=EocryY1gLw8.

OPERAt funding helped the City of Edina test the irrigation system designed by U of M researchers.

June 2020
Drone technology has been used for various purposes, such as supplementing bridge inspection. In collaboration with the FHWA Minnesota Division Office, Campbell coordinated a test that used a UAS to collect intersection traffic data. The drone was operated adjacent to the intersection, but not over the highway. The FPV goggles connected to the drone’s live video feed and a count board to count the vehicles.

Campbell wore the FPV goggles (see Figure 1) and was able to view the UAS live-feed image and collect the data. The drone was positioned about 125 feet above ground, just southwest of the four-way signalized intersection.

The intersection geometry is shown from the drone’s screen in Figure 2. At each of the four legs, the number and direction of vehicles was counted, including turning-movement volumes. The tree in the lower left temporarily obscured the drone’s line of sight but did not affect the collection of data. After reviewing the video, Campbell noted that positioning the UAS in the upper right quadrant of the intersection or using a higher elevation would eliminate any visual obstructions from trees or other objects.

Campbell found use of the drone to be much easier and more efficient than on-ground data collection. In the past, traffic data were collected from a vehicle parked near the intersection, and the technician could see vehicles just as they entered the intersection. With the elevated and wide-angle aerial view from the UAS and large-format image from the FPV goggles, the technician is able to see vehicles for a greater distance approaching the intersection, making it easier to get an accurate count.

Having video of the data collection period is also useful and provides quality control. If a single-technician process is used, the technician will need to fly the drone while recording the intersection and then post-process the video to record the data into the count board in the field or later from the office. From a quality-control perspective, if the data look off, the technician can go back to the intersection and double check the drone footage.

Traffic back-ups on Highway 36

Other traffic-related uses for UAS images or video footage can include observation of weaving segments on freeways, measurement of queue lengths, and identification of risk factors for crashes.

With proper flight operation and planning by a certified Federal Aviation Administration (FAA) airman, high-definition video or digital photos can be captured to reveal traffic up to 1 mile away. The use of a UAS in this situation lends itself to collecting data in one easy step rather than multiple steps in different locations and over multiple days. The UAS can capture video footage that allows the technician/engineer to observe what is contributing to safety or traffic operations problems and determine potential solutions.

Recently, Joe Campbell, with flight assistance by Anthony Fernando from MnDOT’s Aeronautics Office, was able to collect video footage of the traffic on State Highway 36 at Lake Elmo Avenue. The initial video footage was collected during the morning peak hour to investigate how the traffic growth of Highway 36, from 37,000 in 2014 to 44,500 in 2018, may be affecting the traffic queues at the signalized intersection.

Figure 3 is a still image from the video that illustrates that the queue is causing safety problems as traffic backs up to the hill that approaches Lake Elmo Avenue (see boxed area in Figure 3). The faster-moving traffic in the left lane even needs to switch lanes to avoid the longer and slower queue in this lane, as drivers in this lane’s queue are lagging behind in their efforts to accelerate.

Pedestrian movements for Safe Routes to School

The view from a drone can also be useful to review pedestrian movements. A recent Safe Routes to School demonstration project was a perfect example of how images or video from a drone can be used to show pedestrian movements.

The demonstration project shown in Figure 4 was to evaluate pedestrian and traffic interaction if the right-turn lanes were removed and bump-outs installed at opposite quadrants. The video footage was used to determine the differences in the crossing-guard cycles at the two different pedestrian-crossing lengths. The images and video are also a great way to provide information to the public and users of the intersection, providing real images and video of how it performs before any permanent construction.

A tool for traffic analysis—today

When the use of drones in the transportation industry is commonly discussed, their use in traffic analysis is typically viewed in the realm of research and development of automated techniques. But as these three examples demonstrate, data captured from an aerial vantage point can be used to monitor traffic patterns, provide insight on driver behavior, and collect traffic data. These examples show how drones can be successfully used in traffic analysis and added to a transportation department’s toolbox to supplement traffic analysis—today.

—Josh Campbell and Joe Campbell

Learn more

- First-person vision goggles: The next evolution in bridge inspection? (Minnesota LTAP Technology Exchange, Dec. 2017)
- UAS page, FHWA Every Day Counts: fhwa.dot.gov/innovation/everydaycounts
- Systemic Risk Area

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. UAS is an EDC-5 innovation area.
Livestream demonstrations during physical distancing

Joe Campbell, a member of Minnesota LTAP’s Steering Committee, shares his experiences with information exchange during the pandemic.

During our current working conditions and the need for physical distancing, we have all had to adjust to different ways of accomplishing the tasks of our jobs. Travel has been restricted for the vast majority of the public transportation industry, including the FHWA Minnesota Division office, and this led me to the dilemma of choosing between canceling two technology exchanges that were industry, including the FHWA Minnesota Division office, and this led me to the dilemma of choosing between canceling two technology exchanges that were scheduled for South Dakota and Illinois were scheduled for May and June. A follow-up article will summarize how this process worked and discuss potential uses into the future. ■

—Joe Campbell, local programs manager, FHWA Minnesota Division

Stay safe: Wear your PPE!

Download the free PPE pocket guide and posters created by Minnesota LTAP: mnltap.umn.edu /PPE

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 mnltap.umn.edu/publications/library

Other great resources are:
- LRBy site: lrby.org
- MnDOT Library's catalog: dot.state.mn.us/library

Live information services

Livestream set-up, left to right: camera, video converter (attached to tripod cell phone for communication. A YouTube livestream from Saint Paul to a TRB booth in Washington, DC, while using cell phone for communication. ■

Remote livestream set-up, left to right: camera, video converter (attached to tripod leg), stream subject (pointing), computer creating livestream, and computer displaying livestream. Cellular data device not shown.

Remote livestream set-up, left to right: camera, video converter (attached to tripod leg), stream subject (pointing), computer creating livestream, and computer displaying livestream. Cellular data device not shown.

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During our current working conditions and the need for physical distancing, we have all had to adjust to different ways of accomplishing the tasks of our jobs. Travel has been restricted for the vast majority of the public transportation industry, including the FHWA Minnesota Division office, and this led me to the dilemma of choosing between canceling two technology exchanges that were planned or determining an alternate way to deliver them. (One exchange was with SD DOT, MnDOT, FHWA SD, and FHWA MN; the other was with IL DOT, FHWA IL, and FHWA MN.) As is typically done in the transportation industry, I decided to adapt, overcome, and figure out an alternate way to deliver the exchanges. My solution was to transition the exchanges into two separate parts: a web-based meeting and a high-definition (HD) livestream demonstration with equipment that can fit in a computer backpack.

Modify to web-based platform

The first part of modifying these two exchanges was to take the in-person presentation and discussion to a web-based platform—most of us have done so for similar meetings. The second part of the field demonstration takes a different path. The live field demonstrations are not being canceled or videotaped but will be livestreamed from the field with a supplemented conference call line for two-way communication between the attendees and the demonstrators. The livestream platform was picked for these reasons:

- The HD video experience allows video images similar to that of being present.
- It enables two-way communication, allowing people to ask and receive answers to questions in real time.
- It lets the demonstrators show and demonstrate specific features and capabilities, again in real time.
- Real-time communication during the entire process makes the virtual demonstration very similar to being present in the field.

This livestream platform has evolved from the experience of more than four years of cellular data/low bandwidth livestreaming of field/remote high school sporting events at Mahtomedi and an initial proof test during which a livestream demonstration was streamed to a booth at the TRB conference in Washington, DC. TRB attendees were able to try on first-person goggles and could see the HD livestream video feed from a drone operating in Minnesota.

Livestream demonstrations during physical distancing

Joe Campbell, a member of Minnesota LTAP’s Steering Committee, shares his experiences with information exchange during the pandemic.

During our current working conditions and the need for physical distancing, we have all had to adjust to different ways of accomplishing the tasks of our jobs. Travel has been restricted for the vast majority of the public transportation industry, including the FHWA Minnesota Division office, and this led me to the dilemma of choosing between canceling two technology exchanges that were planned or determining an alternate way to deliver them. (One exchange was with SD DOT, MnDOT, FHWA SD, and FHWA MN; the other was with IL DOT, FHWA IL, and FHWA MN.) As is typically done in the transportation industry, I decided to adapt, overcome, and figure out an alternate way to deliver the exchanges. My solution was to transition the exchanges into two separate parts: a web-based meeting and a high-definition (HD) livestream demonstration with equipment that can fit in a computer backpack.

Modify to web-based platform

The first part of modifying these two exchanges was to take the in-person presentation and discussion to a web-based platform—most of us have done so for similar meetings. The second part of the field demonstration takes a different path. The live field demonstrations are not being canceled or videotaped but will be livestreamed from the field with a supplemented conference call line for two-way communication between the attendees and the demonstrators. The livestream platform was picked for these reasons:

- The HD video experience allows video images similar to that of being present.
- It enables two-way communication, allowing people to ask and receive answers to questions in real time.
- It lets the demonstrators show and demonstrate specific features and capabilities, again in real time.
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Congratulations, Roads Scholars!

Thank you, Class of 2019, for your hard work and continued dedication to improving your knowledge and skills!

Bruce Bachman, Crow Wing County  
Chad Braun, Carver County  
David Brown, Steele County  
Trudy Etner, Hennepin County  
Michael Fox, St. Louis County  
Stephen Goerdt, Otter Tail County  
Tim Guimont, City of Albertville  
Brian Koczur, MnDOT  
Steven Kustrich, City of Coon Rapids  
Steven Lawrence, City of St. Cloud  
Joe Matvey, St. Louis County Public Works  
Tanner McClain, Jackson County Highway Dept.  
Jon Mock, Hennepin County  
Matt Nystrom, City of Brooklyn Center  
Dan Plizga, City of Rochester  
Brian Randt, City of Mahtomedi  
Jim Sachs, City of Lake Elmo  
Chad Schmidt, Carver County  
Derek Schroeder, City of Rochester  
Nolan Sprengeler, Plymouth Public Works  
Ryan Thormodson, City of Mankato  
Daniel Tobritzhofer, City of Woodbury  
Joe Torkelson, City of Rochester  
David Traver, Carlton County  
Ted Tulibaski, Otter Tail County

Webinars and virtual events

To help slow the spread of COVID-19, Minnesota LTAP has suspended all in-person activities until further notice. In the meantime, we invite you to participate in webinars and virtual events.

Free online training

These online courses are currently available for free and eligible for Roads Scholar credits:

- 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

These online courses are always free and eligible for Roads Scholar credits:

- Math Basics for Maintenance Technicians (1 RS Maintenance credit)
- Administration and Management Basics (1 RS Leadership credit)
- Work-Zone Safety Tutorial (0.5 RS Maintenance credit) LTAP
- Webinars (0.25 RS Maintenance credit)

Other courses eligible for Roads Scholar Credit

- Installation and Management of Roadside Turfgrasses (1 RS Maintenance credit) LTAP
- Turfgrass Pathology Course (0.5 RS Maintenance credit)

Other online training

Please visit our online calendar for a variety of webinars and virtual events being offered by other agencies to meet your training needs during this time. You can also check out our online training page to learn more about online course options.

- National Highway Institute: Self-paced online courses and web conferences.
- AASHTO TC3 courses: Online training library of 190+ training modules.
- American Public Works Association: Click, Listen & Learn webinars for APWA members.
- FHWA Innovation Exchange Webinars On Demand.
- NLTAPA Tailgate Talks: Short briefing sheets can serve as standalone tailgate talks allowing your clients to brief their crews on safety topics, but they also make great newsletter articles and training aides.
- Institute of Transportation Engineers. The FHWA and ITE provides free web-based training modules to local and tribal public agency practitioners in smaller jurisdictions through the ITE Learning Hub.

Lightning can strike twice

Contrary to the common expression, lightning can and often does strike the same place twice (National Geographic website). What else do you know about lightning? Answers are on page 7.

How many people are struck by lightning in the United States each year?

More than: 200 400 600

On average, how many of those people struck will die?

25 70 125

What percentage of the deaths are male?

30 50 90

True or false:

Lightning sometimes strikes as far away as 10 to 15 miles from any rainfall. (From Lightning Safety, Tailgate Talks, New York LTAP, 2017)