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IOWA STATE UNIVERSITY  
Institute for Transportation

## Snow and ice control: Tips for effective winter maintenance

Winter maintenance preparation begins long before the first snow of the season and requires agencies to plan ahead. Things like forecasting, equipment, personnel, materials (e.g., salt and sand supplies), and available funds affect how an effective operation is accomplished within individual organizations.

This article is not meant to be a comprehensive list, but serves as a starting point for successful snow removal procedures.

### Tips for rural roads

Rural roads, both paved and unpaved, can bring unique challenges with blowing and drifting snow.

1. Mowing shoulders along the roadway can help prevent snow drifts from forming within travel lanes.
2. Tall vegetation along road shoulders can act as a snow fence and enable snow to accumulate within the lanes instead of blowing across the road.
3. Keep gravel roads properly crowned prior to winter, which will aid in the drainage of melting snow and ice from the road service.
4. It is imperative that operators are familiar with snow routes within their responsibilities.

5. Look for areas where visibility may be a concern or is limited, such as at intersections and curves.
6. Be mindful of obstacles, drop offs, and utilities within the right-of-way that could be damaged by snow removal operations.
7. Railroad crossings, bridges, and intersections can bring added challenges and should be recognized prior to winter operations for snow placement and storage.
8. Take note of mailbox locations along the route that are not in compliance with postal codes or not attached firmly to the post. Tag them to make residents aware of the concern and that possible damage could occur due to nonconformity.
9. Make note of school bus stops along the route or other areas where children may gather close to the roadway. If there are questions concerning these locations, local school districts can be contacted to obtain a complete list.
10. Lastly, if operators are unfamiliar with the route, contact coworkers that have knowledge with the area to gain additional insight pertaining to special precautions that may be needed or difficult areas that may be encountered along the route.

*Snow and ice control tips continued on page 3*



Snow plows and icy roads signal the start of another busy winter season for public works departments

## Acronyms and Abbreviations in *Technology News*

AASHTO	American Association of State Highway and Transportation Officials
APWA	American Public Works Association
FHWA	Federal Highway Administration
IHRB	Iowa Highway Research Board
InTrans	Institute for Transportation (at ISU)
Iowa DOT	Iowa Department of Transportation
ISU	Iowa State University
LTAP	Local Technical Assistance Program
MUTCD	Manual on Uniform Traffic Control Devices
NACE	National Association of County Engineers
TRB	Transportation Research Board



U.S. Department of Transportation  
Federal Highway Administration



### About LTAP

LTAP is a national program of the FHWA. Iowa LTAP, which produces *Technology News*, is financed by the FHWA and the Iowa DOT and administered by the Institute for Transportation at Iowa State University:

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## From the Director: Knowledge and wisdom – When less is more

Those who read my quarterly columns know that at the end of the year I typically write about my thoughts about the past and what the future might hold. No matter how hard we try, though, there is only one true place to live, and that is in the present moment. Fond memories of the past are wonderful things, and planning for the future is something we all do to some extent. But, we can't live in either. That said, InTrans and Iowa LTAP have a new website and registration setup that will soon be completely ready to go. Bear with us as we go through that process. We also have some great trainings and events coming soon. These include bridge inspection, excavation, motor grader operation, and low-cost safety improvement workshops.

Iowa LTAP offers workshops, outreach events, and technical assistance to local agency transportation staff. We are knowledge brokers of information that we hope makes these people more efficient and effective. But I've started thinking about the difference between knowledge and wisdom. During this search I've had several professional and personal development interactions that have revolved around finding a vocation (the subject of another column of mine) and leadership traits. For example, I recently found a quote by Lao Tsu that noted that "... [t]o attain knowledge, add things every day. To attain wisdom, remove things every day." Similarly, Eric Kaufmann, who wrote "The Four Virtues of a Leader," indicates (I'm paraphrasing here) that we can become wiser through subtraction, by letting go. That we live most of our life accumulating, but that at some point, less is more. Finally, on December 5, I was listening to Brandye Hendrickson, Deputy Administrator of the FHWA, and she said, if I have this right, that her approach is often led by the idea that ...

good enough is better than perfect (except in the area of safety, of course, and we were at a National Rural Road Safety Summit). For me, these all had the same general theme, that sometimes less is more.

So what does all this mean and how does it fit into what LTAP does? My opinion, is that the lifelong acquisition of knowledge, professional and personal development, is important, essential, and a noble pursuit. I was raised to believe that. But, there are also points in a career and a life, where there is great benefit to letting things go through delegation, focus, trust, etc. And, we need to recognize these points in time. Wisdom is needed in the application of the information we've acquired and how it all fits into, well, everything. By "subtraction" (which can be defined in many ways) we are sometimes able to apply our knowledge in a more effective manner and make decisions with more focus and understanding. As Albert Einstein said, "Wisdom is not a product of schooling but the lifelong attempt to acquire it." It is my hope that Iowa LTAP can help with both the knowledge and wisdom side of things, at least in the area of local agency transportation.

For now, I'll sign off 2018 with the following: Be with family and friends, and know that no one is ever on their own because everything and everyone has more in common than differences—right down to the cellular level. And, have a happy holiday season.

With all my gratitude. Thanks for another great year. ■

Keith

*Snow and ice control tips continued from page 1*

## Truck inspections

To be certain that equipment will perform to standards, pre-trip inspections are a necessity. A systematic, documented approach to the walk-around inspection can ensure a comprehensive review of the equipment used in snow removal operations. These are some of items that should be included in the inspection:

- Lights
- Windows
- Mirrors
- Grease Fittings
- Tires and Rims
- Hydraulic and electrical lines
- Fluid levels

- Plow components
- In-cab controls
- Air system/emergency brakes

Take equipment on a test drive prior to any winter event. Know the controls and functions of the machine and become familiar with its “personality.” Make sure the auger, spreader, and spinner functions are calculated at operating speeds.

## Snow policies and procedures

Know your organizations’ snow and ice policy prior to any winter event. Most cities, states, and counties have snow policies that state what time snow removal operations will begin and end. They also state the amount of snow required to initiate operations. Contained within

the policy should be relevant codes or ordinances pertaining to residents blowing or plowing snow onto the roadway and prioritization of roadways to be plowed.

## Rest

Winter maintenance operations may require long hours with some organizations running a full 24 hours each day until snow removal is complete. Operators need to be aware of the dangers of sleep deprivation and prepare for the long days and nights that effective winter operations demand to maintain safe streets and roads.

*Originally printed in the October–December 2015 Technology News. ■*

# Innovations conference a success

The Innovations in Transportation Conference held October 9–10 had attentive attendees, full of anticipation about the future of the industry, and active minds.

Attention, anticipation, and action were also a theme from the conference’s keynote speaker Simon Anderson, who stressed the “three As” are key to appropriately prepare for the future. His talk to kick off this year’s event was just one of the highlights of another successful conference.

More than 250 attendees came from across the state and country for the two-day conference held in Ames, Iowa to hear more than two dozen speakers offer their assessments of what’s coming down the road in transportation and how agencies can be better prepared. The event is hosted by Iowa State University’s Institute for Transportation (InTrans) and the Iowa Department of Transportation (DOT).

The conference speakers stressed how the coming changes are not only innovative but will make the roads safer.

Beyond the safety improvements that will come with connected and autonomous vehicles, speaker Omar Maher, of Esri,

highlighted how the rise of big data can be used by agencies to identify crash clusters to make necessary changes.

The variety in perspectives of the speakers was another highlight, where attendees could hear from transportation agencies, the vehicle industry, and researchers to get insights into how all stakeholders can have a part in an innovative future of transportation.

The interaction among participants was particularly evident in the transportation leaders’ panel discussion that closed out the conference.

The speakers each came with different perspectives on leadership but optimistic visions about the innovations that are just around the corner.

## Pavement Preservation Tools Workshop

Several attendees who joined the Innovations in Transportation Conference stayed after the event ended for another workshop.

The Iowa DOT, Iowa LTAP, and InTrans held a half-day Pavement Preservation Tools Workshop that started just after the panel discussion closed out the Innovations conference.

The workshop focused on pavement assessment applications and when, where, and how pavement preservation should occur. The presentations included both asphalt and concrete pavement innovations and the effectiveness of pavement preservation. ■



The transportation leaders’ panel closed out this year’s conference

## Iowa LTAP Mission

To foster a safe, efficient, and environmentally sound transportation system by improving skills and knowledge of local transportation providers through training, technical assistance, and technology transfer, thus improving the quality of life for Iowans.

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# Iowa LTAP training program attracts record number of participants

Training has always been an integral part of the services offered by Iowa State University's Local Technical Assistance Program (LTAP), but this year's attendance in their Work Zone and Flagger Training has hit an all-time high.

A total of 712 employees have participated in the training as of August 1, which is over 200 more than the yearly average.

"Although it is a year-round, on-call service, we get brought in mostly from January through April, right before the start of the construction and maintenance season," explains David Veneziano, LTAP's Safety Circuit Rider. "Our training covers everything from work zone setup to how to flag traffic to worker safety."

Veneziano shares trainer responsibilities with Paul Albritton, LTAP's Technical Training Coordinator, as they travel across the state on behalf of Iowa's local agencies.

"We're not sure what led to the increase this year, but it could be any number of things—from an agency anticipating more projects in an upcoming season to a special event coming through an area where there may be a greater need for more traffic control," says Veneziano. "Those are just some thoughts, but agencies train staff for many reasons."

No matter the reason, one thing is for certain, the training they are doing is important on a variety of levels.

"Our goal is to provide them with the information they need to set up work zones correctly. This keeps both the traveling public and themselves safe as work is being completed, as our courses include strategies aimed at preventing deaths, injury, and property damage on our roadways."

That means the more people who are trained, the better prepared they are to handle any type of situation.

"Not everything we teach may be necessarily new to long-time employees, but it can serve as a much needed refresher," adds Veneziano. "But we do hope our training reminds people of the *need for safety* in everything they do in the course of their job."

The Iowa LTAP also teams with the Iowa Department of Transportation (DOT) from January through March each year to offer another safety-related training course—the Iowa Work Zone Safety Workshops. Split into city and county breakout sessions, along with a variety of DOT sessions, this training ensures that everyone from city public works staff to county maintenance personnel have access to the information they need at any time of the year.

*Reprinted from original by Brandy Haenlein, a communications specialist with ISU's Institute for Transportation.* ■

*"Our goal is to provide them with the information they need to set up work zones correctly. This keeps both the traveling public and themselves safe as work is being completed, as our courses include strategies aimed at preventing deaths, injury, and property damage on our roadways."*

*—David Veneziano, Safety Circuit Rider, Iowa LTAP*



## From the Safety Desk: A letter from Lee County

Lee County Deputy Auditor Nikki Sugars sent an email to all county staff titled, “A Thought About Safety.” With her permission, IMWCA is sharing that email with you. Nikki closed the email by encouraging feedback on the safety program, and with her usual tag, “Practicing care, concern, cooperation and common sense creates a safe work place.”

Are you familiar with the million-dollar grape? Coming from a grocery background, we were always expected to be on the look-out for this “grape”. You know the one. It’s the grape that people don’t see as “their job”, so it is left on the floor for the unsuspecting patron to slip and fall on creating the “million-dollar” claim. The claim that so easily could have been avoided had any one of the following taken personal responsibility:

- The produce worker—who let the grape roll away—I’m so busy. I’ll get it in a minute.
- The deli worker—who saw it roll away and said nothing—after all, it’s not their department.
- The cashier—who, heading to break, saw it but didn’t pick it up—it’s not “my” job.
- The patron—who was hurriedly getting the groceries to get home and fix dinner—could have been more aware of their surroundings.

This “accident” could have been prevented.

I realize that there are not actual “grapes” in our regular workday, but if we have a thought for safety in our head, we could all come up with something. Something as simple as picking up a paper towel that has fallen to the floor. It doesn’t have to be huge or expensive to make an impact.

The thing is, if we care about each other, we will tie up electrical cords or pick up and move items that could be a tripping hazard; we will prevent our co-workers from taking dangerous short-cuts and take the time to show them the safe/correct way to get the job done; we will see the potential hazard caused by boxes behind a door and, if it is within our power to do so, correct the issue ourselves or seek help from the safety team member in our department. Larger issues should be brought to the attention of the Safety Committee. The point is that we should not wait. If it’s an easy fix, by all means, fix it! Please don’t wait until someone gets hurt and then take action.

Developing a culture of safety requires each and every one of us to take personal responsibility for our own safety and for the safety of those around us. I believe that by practicing care, concern, cooperation and common sense we can create a culture of safety and, coincidentally, a safe work place.

*Reprinted with permission from the Iowa Municipalities Workers’ Compensation Association (IMWCA) and author Nikki Sugars. Originally appeared in the July 2018 edition of **The Informer**, a publication of IMWCA, as “A thought about safety.” Read the article and more here: [www.imwca.org/NewsEvents/Documents/July18Informer.pdf](http://www.imwca.org/NewsEvents/Documents/July18Informer.pdf). ■*



Attendees at the Fracture Critical Inspection Techniques for Steel Bridges workshop had hands-on training in the applications of NDE testing techniques

# Iowa selects EDC-5 innovations focus areas

*The Iowa Department of Transportation has selected its focus areas among the Every Day Counts round five (EDC-5) innovations initiatives. The five focus areas were selected after the EDC-5 regional summit this past fall.*

The Iowa initiatives are as follows:

## **Reducing Rural Roadway Departures**

Reducing fatalities on rural roads, which account for about 70% of public road mileage, remains a major challenge in the US. Roadway departures on the rural road network account for 1/3 of traffic fatalities. Systemic application of proven roadway departure countermeasures, such as rumble strips, friction treatments, and clear zones, helps keep vehicles in their travel lanes, and reduce the potential for crashes and the severity of those crashes that do occur. Iowa has been in the process of working with counties to develop local safety implementation plans.

## **Safe Transportation for Every Pedestrian (STEP)**

According to the National Highway Traffic Safety Administration, 2016 had the most pedestrian fatalities since 1990, accounting for approximately 16 percent of all roadway fatalities. As pedestrian safety continues to be a concern for transportation agencies across the country, cost-effective countermeasures are available to assist practitioners in providing safer crossings for all pedestrians.

## **Unmanned Aerial Systems (UAS)**

UAS, or drones, can benefit nearly all aspects of highway transportation, from inspection to construction and operations, by collecting high-quality data automatically or remotely. These relatively low-cost devices allow agencies to expedite the data collection needed for better-informed decisions while reducing the adverse impacts of temporary work zones on work crews and the traveling public. UAS is a rapidly expanding technology being utilized by state and local transportation agencies, including in Iowa.

## **Advanced Geotechnical Exploration Methods**

Up to 50 percent of major infrastructure projects suffer impacts to schedule or cost due to geotechnical issues, and conventional subsurface exploration methods provide limited data for project design. Advanced geotechnical exploration methods offer solutions for generating more accurate geotechnical characterizations that improve design and construction, leading to shorter project delivery times and reducing the risks associated with limited data on subsurface site conditions.

## **Collaborative Hydraulics:**

## **Advancing to the Next Generation of Engineering (CHANGE)**

Advances in hydraulic modeling tools are providing a more comprehensive understanding of complex flow patterns at river crossings versus traditional modeling techniques. 2D hydraulic modeling and 3D computer visualization technologies facilitate more effective communication and collaboration, improving agencies' ability to design safer and more cost-effective and resilient structures on waterways. This initiative expands on an effort in EDC-4.

More resources about each of these initiatives and the EDC-5 innovations is available at [www.fhwa.dot.gov/innovation/everydaycounts/edc\\_5/](http://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/).

*Information reprinted with permission of the FHWA. Full article and factsheets are available on the FHWA website under Every Day Counts: [www.fhwa.dot.gov/innovation/everydaycounts/](http://www.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. Every two years, FHWA works with state departments of transportation, local governments, tribes, private industry, and other stakeholders to identify a new set of innovative technologies and practices that merit widespread deployment through EDC. EDC-5 (2019–2020) builds on the progress of earlier rounds. ■

# Workshop and conference calendar

Date	Event Name	Location	Contact
<b>January 2019</b>			
13–17	2019 TRB Annual Meeting	Washington, DC	TRB
<b>February 2019</b>			
1	Work Zone Safety Workshop	Ames	Paul Albritton
6–8	ICPA 55th Annual Concrete Paving Workshop	Des Moines	ICPA
13	Work Zone Safety Workshop	Ottumwa	Paul Albritton
14	Work Zone Safety Workshop	Waterloo	Paul Albritton
15	Work Zone Safety Workshop	Cedar Rapids	Paul Albritton
26–28	2019 Bridge Inspection Refresher Training (NHI Course 130053)	Ames	Paul Albritton
<b>March 2019</b>			
6	Work Zone Safety Workshop	Ames	Paul Albritton
14–16	ISAC Spring Conference	Des Moines	Kelsey Sebern
18	Work Zone Safety Workshop	Storm Lake	Paul Albritton
19	Work Zone Safety Workshop	Council Bluffs	Paul Albritton
<b>April 2019</b>			
6	2019 APWA Iowa Chapter Spring Conference	West Des Moines	Peggy Englehart
8–12	Excavation Safety 2019	TBA	Paul Albritton
14–18	National Association of County Engineers	Wichita, KS	Keith Knapp

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## Event details and online registration

Watch for details and online registration information, by specific dates and events, on the Iowa LTAP Workshops page, [iowaltap.iastate.edu/workshops/](http://iowaltap.iastate.edu/workshops/). ■

## Iowa LTAP Tech Corner—NOAA Weather Radar & Alerts

### What is it?

Timing is everything when it comes to being prepared for severe weather. The more advance warning, the better. The NOAA Weather Radar & Alerts application developed by Apalon Apps gives the ability to instantly check radar and receive alerts when severe weather is on the way.

### How does it work?

The app provides real-time weather updates, and offers push notifications to alert about severe weather, including tornadoes, flood warnings, and snow storms. Users can choose from three map overlays: satellite, radar, and rain, and bookmark locations. Clicking on a location, users can get additional details, like precipitation chances, wind speed, and visibility. The overlays offer interactive animated images that show the progression on the radar, for up to the next 24 hours.

The app also offers short-term (24-hour) and long-term (7-day) forecasts to quickly check what's expected ahead.

### Where can I get it?

Available for free on iTunes or Google Play. Subscription options also exist to get added benefits. ■

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