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Institute for Transportation

## Pedestrian safety design considering winter maintenance

Pedestrian safety treatments can present a challenge to winter maintenance operations—and maintenance efforts in general—based on their designs and characteristics.

To ensure that pedestrian treatment designs consider winter maintenance issues, recent research sponsored by the Minnesota Department of Transportation (MnDOT) identified best practices for designing pedestrian safety countermeasures that are compatible with effective winter maintenance operations while still reducing the risks of crashes and other incidents.

“This research highlighted the need to consider maintenance implications when designing pedestrian infrastructure near roadways, and the results provide agencies with a solid starting point when considering safety treatments,” said David Veneziano, Iowa LTAP safety circuit rider who also led the MnDOT research project.

The research studied seven pedestrian countermeasures including curb ramps, crosswalk markings, smaller corner radii, curb extensions, refuge islands, speed humps, and raised crosswalks. These countermeasures were selected since they help to reduce vehicle-pedestrian conflicts

and crashes, but their impacts on winter maintenance operations can be overlooked during the selection and design process.

Not only were the pedestrian treatments studied for their relationship to winter maintenance operations and equipment but also year-round maintenance operations.

Ultimately, the researchers developed the following recommendations:

- Discuss design plans for pedestrian safety features with maintenance personnel early in the process
- Incorporate dedicated snow storage locations and capacity into the design, if needed
- Carefully consider the durability of decorative or other features used for visual appeal
- Ensure sufficient maintenance staff resources and establish hierarchies of snow and ice removal priorities for pedestrian facilities
- Clarify and codify responsibilities and time frames for winter maintenance of pedestrian safety features

*Winter pedestrian safety continued on page 3*



Pedestrian walkway across a median refuge island (left) and roundabout splitter island (right)

## Acronyms and Abbreviations in *Technology News*

AASHTO	American Association of State Highway and Transportation Officials
APWA	American Public Works Association
FHWA	Federal Highway Administration
ICEA	Iowa County Engineers Association
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

## 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: The action of non-action

There is a story that I have heard many times. It starts with a crowded boat in the open sea. The boat is full of people and a storm has started. The waters are rough, and the boat is close to capsizing (this may have been something you saw in the news today). If everyone on board panics, the boat will surely tip and sink. However, as the story is told, if just one person stays calm and understanding of the situation, they can stop this from occurring. The presence of this person will communicate many things through their action of non-action.

If one takes this story literally, and the engineer in me typically starts there, then there is lots of discussion about whether this could ever happen or not. There is likely to be skepticism and arguments about “why” the situation ever occurred, who is at fault, and on and on. Or, we could just let that drop away, stop analyzing, and just sit with it. Go with whatever feels right about the story that is related to our lives. This act, in and of itself, is also an action of non-action.

So what about you? Have there been situations in your life where your best action was non-action? Think about it for a minute or two. It might take some time. Just that fact maybe says something about our culture in general, but that’s a conversation for another time. These are situations where the wisest thing “to do” is nothing. Not say or fix anything. Maybe it’s listening deeply to the person in need that you are with, however they may be communicating, so they know you are there with them. Perhaps it’s just sitting with them.

I’ve recently had many of these types of opportunities. Or, perhaps, I’m just noticing them more. Sometimes, these are encounters I’ve sought out, but more often than not, they have been thrust upon me. They are often confused, by initial reaction, as being “uncomfortable” situations.

However, I’ve realized that’s the fixer, the engineer, or the academic in me knocking around my brain. The non-action idea bubbles up if I pass through that initial reaction. I’ll admit, though, that I’ve not always succeeded in recognizing all this and have sometimes made things worse by opening my mouth. It’s a habit baked into me both professionally and culturally. So, it takes a lot of effort and practice to get past it. But, if I listen to everything more deeply than I often do, and ask myself “what will serve this person,” an interesting thing sometimes happens, and the answer that may come is—do nothing. Then, it is simply letting things go and serving. No more. No less. But it is all that is needed. So, it is everything.

The Iowa LTAP team has been taking lots of actions on 2024 planning. We recently opened registration for a two-part oversize/overweight permitting workshop. And we are working to get FHWA to approve the two bridge inspection courses requests we submitted last summer. And, in the works if things fall together, are a potential construction inspection webinar series, an intermediate AutoCAD course, a piling course, and a culvert course (the recorded versions from a couple of years ago are available on our website for the latter two). Also, if you want us to come out to your site for flagger training, the application form is on our website until the end of year, in addition to the application for small cities (<10,000 people) to compete for a work zone sign package.

Sending hope through the new year for all of you.

Keith ■

*Winter pedestrian safety continued from page 1*

Additionally, the final report includes a table that will aid agencies and decision-makers in selecting the appropriate countermeasures and summarizes the tradeoffs between keeping pedestrians safe and maintaining the infrastructure itself. The table includes the seven safety features considered, their safety benefits, winter maintenance costs, and general costs.

Prior to this research, which included reviewing agency practices throughout the country including several Iowa and Minnesota communities, there had been

an absence of specific documentation, discussion, or common policies for best design practices, guidance, and solutions for pedestrian safety countermeasures with year-round maintenance in mind.

Agency policies and plans have largely concentrated on sidewalks and who will conduct winter maintenance (i.e., property owners vs. governments) and the timeline in which it should be completed as opposed to discussing designs that can assist in encouraging or facilitating that maintenance.

The final report and associated technical summary are available here: <https://intrans.iastate.edu/research/completed/designing-and-implementing-maintainable-pedestrian-safety-countermeasures/>. ■

## In brief: Lasting LTAP impacts

It is no secret that inclement winter weather significantly impacts traffic safety. With that, snow and ice control can be the most demanding, challenging, and visible tasks performed by our local public agencies.

So, as an ongoing effort to prepare operations staff for the upcoming winter season, the Iowa LTAP has offered its Iowa Winter Maintenance Workshop series for the past three years for all public employees involved in winter maintenance operations.

Held in November, the 2023 Workshops saw 216 participants at six locations

across the state, which includes the cities of Cherokee, Eagle Grove, West Union, Atlantic, Indianola, and Ainsworth.

Workshop speakers included a variety of county and city operators and supervisors, along with DOT maintenance supervisors and Iowa LTAP staff. Presentation topics were specially prepared to include everything from information on snow and ice ordinances and policies, the importance of pre-trip inspections of snow removal equipment, how and when to use deicing products, along with the levels of service and priorities on county roads and city streets.

“We want everyone to be as prepared as possible,” said Paul Albritton, Iowa LTAP Technical Training Coordinator. “The winter season is never easy for our public agencies, but we hope that that by offering the series at multiple places and cities across the state, those who need the information will have access to it.”

The Iowa LTAP staff hopes for a safe and successful winter season. For questions regarding the Iowa Winter Maintenance Workshop series, please contact Paul Albritton at 515-294-1231/[palbritt@iastate.edu](mailto:palbritt@iastate.edu). Don't forget to continue sharing your impact stories with us! ■



2023 Iowa Winter Maintenance Workshops held in Hampton, Atlantic, and Ainsworth

**Clarification:** A previous *Technology News* article stated that 72 percent of fatal crashes in Iowa occurred on secondary roadways. Rather, the statement should have read that approximately 72 percent of fatal crashes in Iowa occurred on rural roadways (interstates, state highways, secondary roads, etc.). We apologize for the confusion. ■



### 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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# Technology News to transition to all-electronic edition

## LTAP plans to publish final print copy in December 2024, seeks subscriber emails

After more than 40 years of printing a regular *Technology News* edition, the Iowa LTAP is planning to transition to an all-electronic newsletter by the end of 2024.

While staff are still solidifying details of the transition, we're announcing early and hoping readers will want to continue to hear from us after the printing ends.

For those who **already receive** the electronic edition of *Technology News* or who already receive our Iowa LTAP Biweekly Resource newsletter, you have been **automatically added** to our electronic edition.

For those **not currently subscribed** to our electronic editions but would like to continue to receive *Technology News* after printing ends, **join the electronic newsletter** edition by going to the Iowa LTAP home page (<https://iowaltap.iastate.edu/>), clicking on the *Subscribe to Our List* link, and filling out the requisite information.

During this transition time period, please reach out to Director Keith Knapp (kknapp@iastate.edu or 515-294-8817) with any feedback or thoughts. We appreciate input on everything Iowa LTAP does, and we thank you in advance for bearing with us during this time.

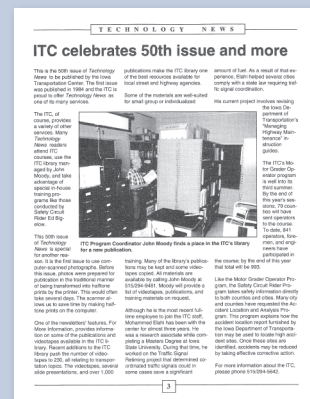
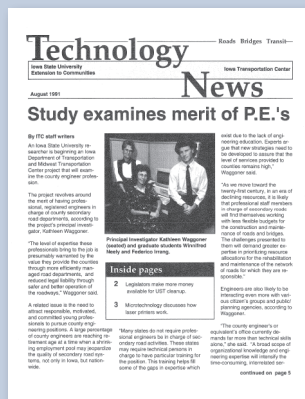
### Background on the transition

Within three months of the Iowa LTAP being established at ISU in 1983, the staff had put together and printed its first *Technology News* newsletter, a publication that has been printed on a regular basis ever since.

From a high of about 3,000 print subscribers in 1999, *Technology News* still goes out to nearly 1,300 readers each quarter. However, new subscription requests during the past nearly 5 years skew toward preferring an electronic copy of the newsletter (82% prefer either electronic or both electronic and physical, just 17 percent only want a physical copy).

Additionally, since the COVID-19 pandemic required Iowa LTAP to take all of its efforts online and necessarily increase its electronic mailings, we now have a strong mailing list and a reader base accustomed to hearing from us online and in a timelier manner.

Iowa LTAP staff have been discussing this possible transition from print internally and with the advisory board for about the past 5 years, and put simply by Director Keith Knapp, "It's time." ■



# Open house highlights geosynthetic base stabilization research

## PROSPER project also addresses reuse of plastic waste

Geosynthetics can offer a promising solution for road base stabilization. In addition, utilizing geosynthetics made from recycled materials can benefit everyone since plastic waste poses a significant environmental challenge.

An in-progress project from the Program for Sustainable Pavement Engineering and Research (PROSPER), led by its director Halil Ceylan, aims to determine the structural benefits and environmental suitability of using recycled plastics as a base stabilization agent.

The project began in 2022, and the first test section was built in late September. To mark the occasion, demonstrate the technology, and discuss the research, PROSPER organized an open house on September 26 held in Independence, near the test section site.

“This here is like a triple win,” said Buchanan County Board of Supervisors Chair Clayton Ohrt to kick off the event that included more than 20 people.

He cited the project’s potential provide environmental benefits from using upcycled plastic waste, the creation of jobs and business opportunities in the county, and to address infrastructure issues related to freeze-thaw cycles as the triple benefits.

It’s fitting that Buchanan County is the location selected for the test sites for the project, as the research is a direct result of Ohrt asking about the potential to use recycled plastics as a base stabilizer.

Five years ago, a short message Ohrt sent to Buchanan County Engineer Brian Keierleber included the question, “Would using a percentage of plastic with base stabilization be an option?” Keierleber’s response back included the sentence, “A very good question for Dr. Ceylan.”

From there, the idea was submitted to the Iowa Highway Research Board, which is now sponsoring the PROSPER project along with the Iowa Department of Transportation (DOT).



Demonstration of base stabilization testing equipment at the test site near Independence, Iowa

## Base stabilization as solution

One solution to the world’s plastic waste is using plastic waste in transportation infrastructure applications. Its use has been well-documented in asphalt and concrete, though less so in base stabilization.

Independence’s Frost Avenue offered an ideal ground for one of the research project’s demonstration site because of its silty soils. Ceylan said that though Iowa is blessed with fertile soils for agriculture, those soils also present challenges for infrastructure.

One motivation for the research was the impact of frost boils during a particularly difficult spring for the transportation industry. The frost boils made transporting livestock and grains almost impossible on rock roads during spring 2019, and the lives of many farm animals depended on the transportation of grains.

Geosynthetics can help provide stabilization, while also reducing the amount of aggregate needed for granular roads. Depending on the subgrade California bearing ratio (CBR), the amount of aggregate needed for an unstabilized road can be as much as 30 inches but can be anywhere between 15 and 6 inches for a stabilized road using geosynthetics.

Utilizing geosynthetics made from upcycled plastics can provide an innovative, environmentally friendly, less expensive, and more sustainable and resilient alternative to strengthen the bases of Iowa’s granular roads. They also provide high durability to freeze-thaw cycles and help the Buchanan County and Iowa economy.

An appropriate geogrid made from upcycled plastics, used in a well-designed road infrastructure system, will combine the use of plastic waste with the least amount of resources (such as aggregates, concrete, or asphalt) to support the maximum life span of the road system, playing a key role in sustainability.

The successful outcomes of this research will not only reduce landfill waste but also mitigate the adverse impact of microplastic pollution caused by plastic waste in Iowa and elsewhere.

Learn more about the research by visiting: <https://prosper.intrans.iastate.edu/research/in-progress/base-stabilization-of-iowa-granular-roads-using-recycled-plastics/>. ■



# 12 cities win work zone sign packages

Iowa DOT-funded program led by Iowa LTAP application period now open

From a total of 156 applicants, 12 cities were awarded a basic package of work zone signs and personal protection vests in this year's Work Zone Safety Sign Package Program.

The winning cities were Afton, Bonaparte, Coon Rapids, Corydon, Denver, Forest City, Linn Grove, New Hartford, Ossian, Parkersburg, Robins, and Sheldahl. The population range for the cities that applied this year ranged from 163 to 4,285 residents, with an average population of 1,452.

"This year, the program provided basic work zone signs, equipment, and personal protection vests to 12 smaller cities that



Work zone sign package

otherwise would not likely be able to afford to purchase new or replacement work zone equipment. This will better ensure the safety of their workers and the traveling public," said Paul Albritton, Iowa LTAP Technical Training Coordinator and co-organizer of the program.

The program, funded by the Iowa DOT, is open to Iowa cities with populations under 10,000 that may have more limited budgets to purchase the basic work zone safety package, despite their commitment to worker and community safety.

Iowa LTAP led a pilot program in 2017 to assist those smaller cities, and the program has continued annually since. It has since grown from just 10 applicants to the more than 150 small cities that applied in 2023. Each year, between 10 and 12 cities are awarded a work zone sign package. ■

The application period for the 2024 program will be open until December 31, 2023. The application includes questions about your department, past staff attendance at trainings, and details about your department's current work zone related equipment. To apply, visit the Iowa LTAP website here: <https://iowaltap.iastate.edu/iowa-ltap-work-zone-sign-package-program/>.

Contact Iowa LTAP Technical Training Coordinator Paul Albritton at [palbritt@iastate.edu](mailto:palbritt@iastate.edu) or 515-294-1231 with any questions. ■



The 2023 Iowa Streets and Roads Workshop and Conference (top) and Multidisciplinary Roadway Safety Series (bottom) events kept Iowa LTAP busy this fall

# Workshop and conference calendar

[Information current as of December 15, 2023] Iowa LTAP will continue holding both virtual and in-person events and trainings throughout the winter.

For the most up-to-date information about in-person attendance requirements and additional upcoming virtual events, please check regularly at <https://iowaltap.iastate.edu/events/> and consider subscribing to our mail list at <https://iowaltap.iastate.edu/> for email updates.

2024	Event Name	Location	Contact
<b>January</b>			
7–11	TRB Annual Meeting	Washington, DC	TRB
24–25	Iowa DOT Federal-Aid Overview Seminar	Boone	Nicole Moore
30	Oversize/Overweight Permitting Workshop, Part 1	Webinar (8:30 a.m. CT)	Keith Knapp
31–1	Iowa DOT Federal-Aid Overview Seminar	Hiawatha	Nicole Moore
<b>February</b>			
6	Oversize/Overweight Permitting Workshop, Part 2	Webinar (8:30 a.m. CT)	Keith Knapp
7–9	ICPA 60th Annual Concrete Paving Workshop	Des Moines	ICPA
16	Iowa DOT Appia Training	Carroll	Niki Stinn
21–22	Iowa DOT Federal-Aid Overview Seminar	Denison	Nicole Moore
26	Iowa DOT Appia Training	Marion	Niki Stinn
27	Iowa Work Zone Safety Workshop	Cedar Rapids	Paul Albritton
28	Iowa Work Zone Safety Workshop	Cedar Falls	Paul Albritton
29	Iowa Work Zone Safety Workshop	Ottumwa	Paul Albritton
<b>March</b>			
5	Iowa Work Zone Safety Workshop	Storm Lake	Paul Albritton
6–8	Greater Iowa Asphalt Conference	Des Moines	Keith Knapp
14–15	ISAC Spring Conference	Des Moines	Keith Knapp
21	Iowa Work Zone Safety Workshop	Ankeny	Paul Albritton
26	Iowa Work Zone Safety Workshop	Council Bluffs	Paul Albritton
28	Iowa Work Zone Safety Workshop	Ankeny	Paul Albritton
<b>April</b>			
4–5	APWA Iowa Chapter Spring Conference	West Des Moines	Beth Richards

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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/](https://iowaltap.iastate.edu/workshops/). ■

## Interested in Basic Work Zone/Flagger Training?

**Survey to show your Basic Work Zone/Flagger Training interest.** Each spring, before the construction season, Iowa LTAP offers on-site basic work zone/flagger training to local public works and secondary road agencies in the state. Anyone interested in this type of training can fill out the form at <https://iowaltap.iastate.edu/basic-work-zone-and-flagger-training/>, which requires only contact information and the approximate number of people that would attend. Iowa LTAP staff will use this information to organize and plan trips to particular areas of the state. ■

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