

Providing transportation technology transfer for Iowa's cities and counties

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LTAP celebrates 35 years

ISU's Institute for Transportation got its start 35 years ago, and it all began with LTAP.

The Local Transportation Information Center (LTIC) first received FHWA funding in the early 1980s, and it has been in operation ever since. That includes 35 years of providing useful local technical assistance through *Technology News*.

"Most of you are painfully aware of the major transportation problems facing our small urban and rural areas. Streets and roads are in disrepair or are obsolete, with no improvement funds available," reads the introduction of the LTIC's first newsletter in April 1983.

Today's *Technology News* readers may recognize many of those same challenges, and the Iowa LTAP continues to provide much-needed guidance on everything from road safety to infrastructure maintenance to improved technologies.

From the start, there was a focus on safety, and the program has always offered workshops and the latest updates to the MUTCD and information on new technologies.

But, it's also worth looking at just how that technology has changed.

The first newsletter boasts about its upcoming local support with a toll-free "Info-Line" to talk with staff directly, "microtechnology" articles that focus on incorporating computers into jobs using floppy disks, and, later, an "on-line bulletin board system."

Today, our "Tech Corner" offers up information about the latest apps for smartphones.

The earliest newsletter shows just five people behind the LTIC and its newsletter, where today LTAP has a staff of seven and an advisory board with another 11 people involved in bringing the latest news to readers each quarter. This year also marks eight years since Keith Knapp, who is now the program's director, joined LTAP.

While the people and location have changed—and after several name changes too—the mission is still the same. Here's to another 35 years of providing transportation technology transfer for Iowa's cities and counties! ■

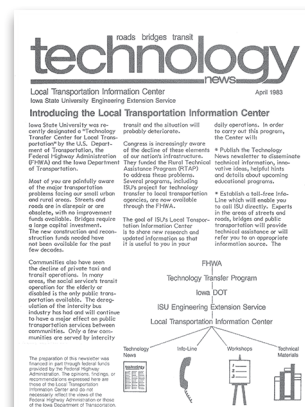
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Institute for Transportation



LTIC's first newsletter in April 1983 (left) and current Iowa LTAP staff members (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
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: Applying fluid presence

In the last year or two, I've started to write about some of the things I like to do and the places I like to visit. These activities, and what I learn from them, influence the approach I take with my job and the tasks it includes. I hope you find these columns interesting and helpful. This is one of those columns, so here we go.

In April, I took a trip to New Zealand that I had been planning for some time. The trip lasted a little more than two weeks and was a once in a lifetime experience for me. I went to this beautiful country to go day hiking and do a little bit of biking and kayaking. It was challenging at points, but this tends to be how I spend my time off. The picture here shows me above the clouds. It was one of my favorite days.



A few weeks after arriving back, I also had a day of training through the National Rural Safety Center in New Mexico. I took the preceding weekend to revisit and hike in what I've noted is one of my favorite places: Santa Fe. The amount of gratitude I have for the ability to go on these types of trips is so large that I can't even find the words to describe it.

My approach to these trips is to embrace the experience as much as I can. To be there fully, in both body and spirit. Hiking trips in these areas, in particular, are both new and highly "variable." They require advance preparation, but one also has to be fully present in these ever-changing situations. This continuous impermanence that requires the need to truly "be there" also leads to fuller enjoyment (in my opinion, it increases tenfold) and a safer experience. If one is able to tie these moments together, throughout this and other activities, there is a possibility of what I call "a state of fluid presence." This is much easier to describe than to do, but it all starts with those individual moments and, with practice, grows from there. Think of the moments and fluid presence as the differential and equation, respectively, if you have a more analytical bent.

The focus I'm describing can be transferred over to work experiences and the relationships developed between everything and everyone. We all work within ever-changing environments that have a variety of people and factors that we can't control but impact our decision-making and how we advance from one point to another. The need to work through situations and be there for people, listen to them, and respond accordingly is part of all our jobs. In my opinion, this is the idea behind most of what we hear from keynote speakers that describe how to be more successful at work. It is not a new idea and, in fact, it has been around thousands of years, but those that can fully immerse themselves in the work they do and enjoy tend to also be more effective at those jobs. Not an original idea, but in an important one that can be put in many different packages.

This quarter, the Iowa LTAP will find out about the new national strategic plan from FHWA. We will respond accordingly to this change, adjust to the new requirements, but develop a program that will continue to serve what we know are the needs of our local agencies in the technical assistance area. Our response will require attention, vigilance, and fluidity in approach and thought. We are up for that challenge. Sometimes an environment can seem harsh, but out of it can grow great knowledge and beauty.

We have the Iowa County Engineers Association (ICEA) midyear meeting coming up in July, along with the Iowa State Association of Counties (ISAC) annual conference in August. Don't miss those. In the fall, we may have another bridge training, and the local road safety series will also occur. Watch closely over the coming months, as our registration system will change this fall and there may be some transitional interfaces. We may also have more "pop up" innovation open houses or events.

"...Allow nature to teach you stillness."
ECKHART TOLLE

Be safe on the road this year. ■

Keith

InTrans holds successful first Innovation Demonstration & Training Day

InTrans hosted its Innovation Demonstration & Training Day on Tuesday, April 17, 2018. More than 120 people attended the successful event.

The first-of-its-kind event had multiple activities to keep attendees busy and engaged throughout the day. About 40 of the attendees took advantage of important training on the newest updates to the MUTCD.

They, and other attendees, also had the chance to get a series of hands-on

demonstrations of cutting edge tools, implementation materials, and research products in the transportation field.

These innovations improve the safety of the traveling public and roadway workers, and increase the efficiency and effectiveness of transportation agencies and contractors.

InTrans staff from various centers and programs led demonstrations on asphalt materials, concrete pavement, bridge inspections, and traffic operations research.

Plus, vendors were on-hand to share their latest, including 3M, Horizon Signal Technologies, Iowa Plains Signing Inc., and Traffic Control Corp. 3M's Transportation Safety Roadshow Trailer offered 70 feet of hands-on, in-person demonstrations for 3M roadway innovations.

Thanks to the vendors, staff, and attendees for making the day a success! ■



Travis Hosteng, of the Bridge Engineering Center, gives a demonstration on timber piling inspections



Attendees line up to get a peek at the 3M Transportation Safety Roadshow Trailer



Xuhao Wang, right, of the CP Tech Center shows an attendee V-Kelly durability test equipment



A Horizon Signal staff member demonstrates the company's portable traffic signals

Innovation webinars

The FHWA Center for Local Aid Support has been hosting a free innovation webinar series that includes topics that may be of interest to local agencies. Past topics have included gravel road maintenance, pavement preservation, and ultra-high performance concrete, among others. All webinars are recorded and made available for later viewing. To see past and upcoming topics, as well as register and access past recordings, visit: <http://www.iowaltap.iastate.edu/workshops/FHWA-webinars/>. ■

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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Planning for safer local roads

Data-driven safety analysis helps local agencies target transportation investments

Local entities own about 75 percent of America's road miles. Almost 50 percent of the nation's roadway fatalities occur on these roads, creating a need for local agencies to invest their limited safety dollars as strategically as possible.

To help local agencies plan for the most effective investments, the Every Day Counts round four (EDC-4) data-driven safety analysis (DDSA) deployment team is advancing locally focused initiatives. One approach promotes local road safety plans (LRSPs).

LRSPs provide a framework for identifying, analyzing, and prioritizing roadway safety improvements and strategies on local roads. These plans are tailored to local issues and needs. The process results in a prioritized list of issues, risks, actions, and improvements that can be used to reduce fatalities and serious injuries on local road networks. The plans are so effective in identifying and addressing local safety issues that they're included in the Federal Highway Administration's proven safety countermeasures.

"The major value of these plans for local agencies is awareness of where the safety issues are," said Rosemarie Anderson, FHWA transportation specialist and DDSA team member. "The LRSP development takes local agencies through a step-by-step process of identifying emphasis areas and selecting countermeasures based on the data."

Anderson also emphasized that, where possible, agencies should coordinate their LRSPs with their State Strategic Highway Safety Plan.

"When projects in an LRSP align with the State Strategic Highway Safety Plan, they are more likely to qualify for Highway Safety Improvement Program funding," Anderson said.

Local Plan Pilot

The EDC-4 DDSA team is partnering with the National Association of County Engineers (NACE) to deploy the use of LRSPs and help local agencies develop plans. The partnership launched a pilot project focusing on 26 counties in California, Colorado, Florida, Nevada, Ohio, and Wisconsin. The pilot provides agencies with a blended learning experience that includes technical assistance, a series of webinars, and a hands-on workshop where participants leave with a draft plan in hand.

"Our goal is to get several counties within each State to develop plans through the pilot," said former NACE Executive Director Brian Roberts. "Those agencies can then be spokespersons to convince their peers that there is value in investing time in a plan. If we can demonstrate success stories using a simple approach, people will be more comfortable starting their own."

The idea is to provide local agencies with a flexible, proven tool to help get people home safely. "LRSPs work," Roberts said. "And any time you have a plan, it helps you."

Reprinted with permission from the FHWA. Originally appeared in the March/April 2018 Issue 65 of *Innovator* as "PLANNING FOR SAFER LOCAL ROADS." Read the original and more here: www.fhwa.dot.gov/innovation/innovator/issue65/issue65.cfm. ■



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-4 (2017–2018) builds on the progress of earlier rounds. ■

From the Safety Desk: Work zone safety is year-round job, aided by new technologies

April saw the 19th work zone safety awareness week.

But for engineers at InTrans and staff at the Iowa DOT, work zone safety awareness is never-ending. Literally.

Traffic sensors and cameras are set at specific locations along key traffic critical projects to monitor work zones 24-7.

InTrans collects data from those sensors and cameras every 20 seconds, and then machine learning and algorithms are able to pull out usable information that alerts key personnel at the Iowa DOT to any traffic slowdowns.

Plus, the data gets posted to InTrans' Real-time Analytics of Transportation Data (REACTOR) Lab website, so engineers and contractors can monitor traffic patterns weekly, daily, and over time, to see how the critical work zones are performing.

"This is just providing the eyes and ears that are always watching and listening," said Skylar Knickerbocker, a research engineer with the REACTOR Lab, who oversees the data collection and management for Iowa's Intelligent Work Zone (IWZ) program.

The number of sensors and cameras vary per project, but on average the sensors are placed a mile apart. Iowa is currently monitoring 24 traffic critical work zone sites.

Using big data

The recent advances in technology have allowed for the collection and interpretation of data, and over the last three years, InTrans has refined both to provide better insights into what's happening in work zones across the state. The number of performance measures have been refined, but one of the most accessed is the speed heat map, which is a graphical tool that color-codes the travel speed over a period of time to highlight when slowdowns occur.

Knickerbocker said text alerts, a resource added in 2017, notify DOT engineers sooner when traffic stops for longer than five minutes. The text message is automatic and comes with an image to show the extent of the backup, so the DOT is aware of an issue immediately rather than learning of it when a call comes in about the congestion.

Knickerbocker and Neal Hawkins, associate director of InTrans and the REACTOR Lab, make clear their role is to collect and analyze the data, rather than make decisions for the Iowa DOT.

"We're not telling them what to do. We're telling them there's something going on here, so that they are aware of it as soon as possible," Hawkins said.

A faster response

But the information alone has proven valuable.

"Safety in work zones is always our focus at the Iowa DOT, and the text message alerts and traffic performance data provided by InTrans have been game-changing tools. InTrans is able to take massive amounts of sensor data and

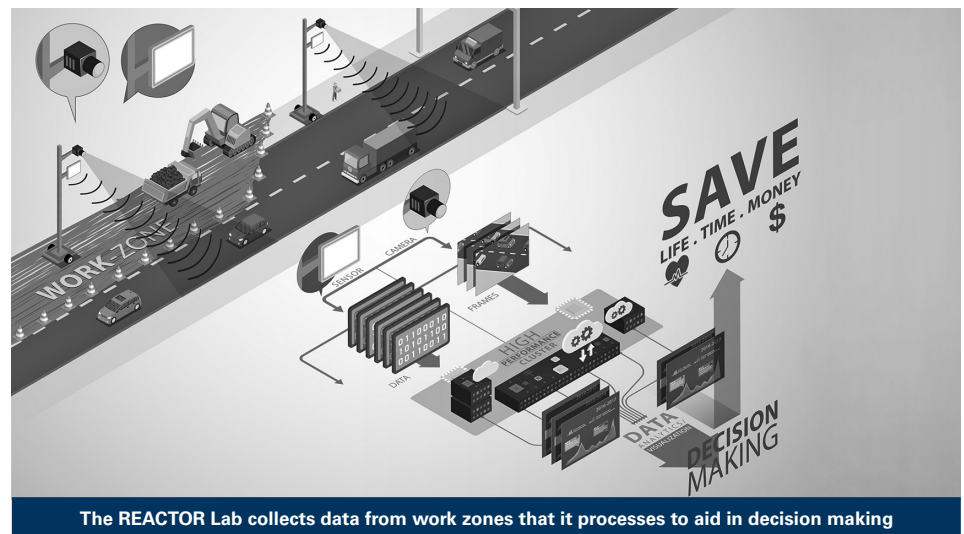
boil it down to specific, instant, and useful information about traffic issues in our work zones. That information allows us to take appropriate and immediate action to make our work zones more safe and efficient," said Tim Simodynes, an Iowa DOT's intelligent transportation systems engineer.

Knickerbocker also notes that past practice—before establishing more immediate access to the data—would have been to provide work zone traffic information in an annual report. If there were traffic problems identified in the annual report, it was too late to implement any mitigation strategies because most of the construction projects were finished at that point.

The current data analytics on traffic critical projects, on the other hand, gives performance measures on a regular basis so the Iowa DOT can make traffic control changes, or even deploy automated queue detection and warning systems, while the work zone efforts are ongoing.

For additional information

Visit: <https://reactor.ctre.iastate.edu/> ■



"Safety in work zones is always our focus at the Iowa DOT, and the text message alerts and traffic performance data provided by InTrans have been game-changing tools."

—Tim Simodynes, Transportation Systems Engineer, Iowa DOT

InTrans centers help with bridging the gaps

Nearly half of US bridges are nearing the ends of their projected life cycles. An estimated quarter of US bridges are deficient in some fashion. That makes construction of new bridges that are safer, more resilient, and less expensive a high priority for transportation departments all over the country.

Three centers at the Institute for Transportation at Iowa State University are helping Iowans make critical progress on all three bridge building fronts. These units partnered with the Iowa DOT and Buchanan County in east central Iowa to carry out a FHWA funded program grant aimed at fostering innovative concepts in bridge construction. ISU's Bridge Engineering Center (BEC), the National Concrete Pavement Technology (CP Tech) Center, and the Center for Earthworks Engineering Research (CEER) played a part in accomplishing the project goals.

Buchanan bridge features

An aged timber bridge spanning Prairie Creek in Buchanan County was replaced in 2014 with a cast-on-site adjacent box beam bridge, fabricated from a high-performance concrete mixture made with light-weight fine aggregate to improve internal curing. The bridge abutments used a new type of reinforced soil and featured testing of a vertical drain to help during severe rain events.

Brent Phares, director of the Bridge Engineering Center, said, "The construction of this rural bridge allowed us to work

on two key bridge design elements. We assisted Buchanan County with design of the geosynthetic-reinforced soil (GRS) abutments and helped create the superstructure design with the Iowa Office of Bridges and Structures."

The Buchanan bridge project was part of the Innovative Bridge Research and Deployment (IBRD) program sponsored by the FHWA that encourages the use of inventive new practices in the bridge industry. A key part of this effort was devising a way to construct the bridge without the use of a traditional overhead crane. This offers advantages to Iowa counties where bridge projects often are carried out by county road staff who may not have ready access to a crane. (The project showed that using backhoes may be the optimum way to lift the cast-on-site beams onto the bridge span.)

Phares pointed out that the construction of beams on-site followed by moving them over the abutments saved considerable construction time. He noted, "Motorists will be inconvenienced for a much shorter period of time when this tactic is used, leading to less traffic disruption in the area."

New bridge passes tests

The ISU transportation research units were involved in testing and evaluation of the bridge throughout the project. They conducted tests on the concrete mix used for the beams, the elements of abutment construction, and the placement of the

prefabricated superstructure on the GRS abutments. When the bridge was completed, they continued to monitor its performance for three years (2014, 2015, and 2016) via live load tests and other data collection mechanisms.

Researchers found that the tests showed the bridge joints were well connected and performed well. The inclusion of a vertical sheet drain in one of the bridge abutments yielded improved drainage conditions over the abutment without a vertical sheet drain. This information could prove valuable in the future if rainfall events worsen.

Phares says they would like to see the cast-on-site beams deployed and tested for a longer span or on a multiple-span bridge to see how widely the technique might be applied with success. Further investigation of the optimum backfill materials, with emphasis on the types regularly used in Iowa, could yield benefits for bridge composition in the future.

A report on the tests performed on the bridge by the ISU research group can be seen here: www.intrans.iastate.edu/research/documents/research-reports/Victor_Ave_over_Prairie_Creek_IBRD_bridge_eval_w_cvr.pdf.

Reprinted from original by Mary Adams, a communications specialist with ISU's Institute for Transportation. ■



Workers aid in a live load test of the Buchanan County bridge

Workshop and conference calendar

Date	Event Name	Location	Contact
July 2018			
10	Bridge Deck Preservation with Epoxy Injection Demonstrations	Cherokee	Keith Knapp
12	ICEA Midyear Conference	Ames	Keith Knapp
August 2018			
23–24	ICEA Affiliate Meeting at ISAC Annual Conference	Des Moines	Keith Knapp
September 2018			
18–20	Iowa Streets and Roads Workshop and Conference	Ames	Beth Richards
19–20	MINK Conference	St. Joseph, MO	David Veneziano
October 2018			
9–10	Innovations in Transportation Conference	Ames	Judy Thomas
11–12	APWA Iowa Chapter Fall Conference	Iowa City	Jason Havel
December 2018			
4–6	National Summit on Rural Road Safety	Savannah, GA	Keith Knapp
12–14	ICEA Annual Conference	Des Moines	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, www.iowaltap.iastate.edu/workshops/ltap-workshops/. ■

Iowa LTAP Tech Corner—The Slope Calculator

What is it?

TrenchSafety and Supply, Inc. is all about solutions that help contractors and employees working in trench excavations stay safe. Keeping in line with this goal, TrenchSafety developed a handy, easy-to-use, and free online tool that enables users to explore the pros and cons of both sloping and shoring/shielding.

How does it work?

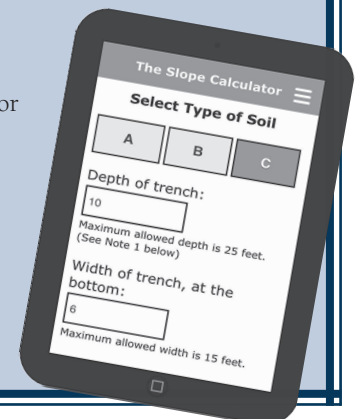
This tool can be pulled up and used on most any electronic device—like smartphones and iPads! Once opened, users can select the soil type they'll be working in and plug in the dimensions of the proposed excavation. Excavation options are instantly calculated and compared, so users can make the decision on the best safety method to use. There's even a drawing to give users a quick visual idea of what will be involved with both methods.

Afterward, users can save their results to their computer or digital device as a PDF that can be printed and emailed.

Users can even plug in “what if” dimensions, to compare their impact, then save each scenario for later review.

Where can I get it?

Available for free on iTunes or Google Play ■



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