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IOWA STATE UNIVERSITY  
Institute for Transportation

## Spreadsheet tool aids in pavement analysis

Current pavement condition measurement tools don't offer much-needed context for how long a roadway will remain in a particular condition or how its performance may change over time.

To provide that context, researchers at the Institute for Transportation (InTrans) developed a spreadsheet tool that can help local agencies to determine when preservation and/or rehabilitation are required for their agencies' roadway sections.

The project led by principal investigator Halil Ceylan, director of InTrans' Program for Sustainable Pavement Engineering and Research (PROSPER), developed the Iowa Pavement Analysis Techniques (IPAT) tool that can be used to estimate project- and network-level pavement performance and remaining service life or remaining service interval (RSL or RSI) for four pavement types.

"The developed tool and models will significantly assist county engineers in their decision-making processes," Ceylan said. "Accurate RSL/RSI estimations can help facilitate maintenance and rehabilitation decisions to provide better prioritization and allocation of resources."

To create the tool, the research team developed statistics- and artificial neural network (ANN)-based pavement performance and RSL/RSI models using pavement structural features, traffic, construction history, and pavement performance records obtained from the Iowa Department of Transportation (DOT) Pavement Management Information System (PMIS) and the Iowa county agencies' database. The accuracy

of models was evaluated using the real database representing Iowa county pavement systems.

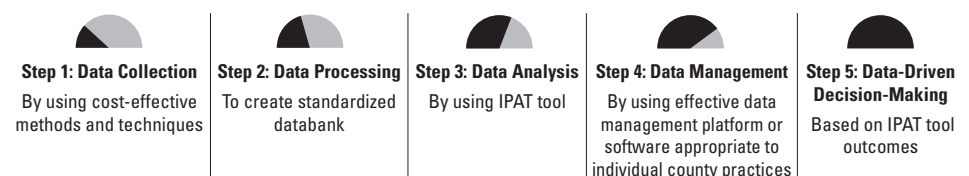
The IPAT tool provides a series of options for four pavement types representing Iowa county pavement systems—jointed plain concrete pavement (JPCP), asphalt concrete (AC) pavement, AC over JPCP, and portland cement concrete (PCC) overlay—to estimate RSL through different approaches based on various conditions and distress data availability from an individual county.

In addition, the project introduced and demonstrated the concept of developing an Iowa historical performance databank (HPD) by using raw data collected from county pavements, and the team investigated the feasibility of integrating preservation and rehabilitation techniques for RSL predictions using ANN models to evaluate the effects of treatments on the RSL of pavements.

"The IPAT tool developed in this study is a user-friendly tool that provides flexibility in launching different types of tools based on pavement type and data available from local agencies," Ceylan said.

He added, "The statistics- and AI-based approaches have been successfully utilized to help estimate pavement performance and RSL/RSI in facilitating decision-making and managing county pavement systems."

More information about the project, access to the tool, and a user guide are all available here: <https://intrans.iastate.edu/research/completed/development-of-iowa-pavement-analysis-techniques/>. ■



## 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: Wisdom of Grandpa

I don't know about you, but I grew up watching *The Waltons* with my family. I remember very distinctly that most of the family would get together to watch. Adults on the furniture and us kids sprawled on the floor (or possibly fighting over the one chair left). I am not sure why, but I have recently started watching this show again. Perhaps it's a nostalgia for simpler times I never experienced. Or could it be a recent resonance with the uncertainty of the times they were dealing with—the Great Depression and the coming of World War II—and where we are today? Maybe it's some visceral connection helped along by a group of actors who truly appear to enjoy the company of each other.

While the details in the background may change, the very human response to regain some appearance of control during times of uncertainty remains the same. These attempts at control can occur at both the individual and societal levels with varying results. They either reduce or enhance what might be thought of as hard times. Likewise, I also think that the basic building blocks to getting through hard times “intact” are the same now as what they were during those of the Waltons. Simply put, it might go like this: embrace community, trust in the goodness of others, and enjoy the little things (also Rule #32 of *Zombieland*). First, lean on family, friends, and any other community within which you are part. Those you trust to not only tell you what you want to hear, but maybe more importantly in these times, what you don't want to hear. When we don't agree, we learn, but we can still respect each other. Different circumstances. Different viewpoints. All valid. Second, goodness is our base starting point. This doesn't change, but some forget it. Look for it and you'll see it. It rarely makes the media, but it was front and center when Winterset was hit by a tornado. Much

more typical, though, is what happened the other day. At a long line in the store, a woman holding a beautiful baby was allowed to go to the front. These unnoticed gestures of kindness are all around us. They are there if we choose to see them or be them. Third, little things can carry us through. A smile. The touch of a hand. The smell of spring. Or, as Grandpa Walton might say, sometimes when we are at the top of a mountain, looking at the hills and valleys, we just wish we had someone we love to share it with. And sometimes, we just want to be a kid and go down to the stream and sit with our feet dangling. There is great wisdom there.

LTAP is in the middle of a very busy spring. We have seen demand dramatically exceed the normal for many of our efforts. We can only assume it is the result of people not doing online training during the pandemic and a significant turnover of staff during that same time (and continuing). Our staffing is also down and, of course, budgets remain the same. We ask for your patience as we work through the demand for our basic work zone and flagger training. Our basic AutoCAD course also filled very quickly, and we are developing a waiting list for the next one. Also, coming up from April to June are a series of leadership webinars, motor grader operator training, a signing workshop, and our Local Agency Bridge Innovation and Demonstration Days. Please take advantage of these efforts as we plan our approach for the remainder of this year and the upcoming three years.

Don't forget, we are also accepting Build a Better Mousetrap applications until May 6. Please consider submitting something. The application process is all online.

With all gratitude,

Keith ■

# Iowa LTAP now accepting applications for Mousetrap contest

## Competition deadline is May 6

It is the people on the front lines who often discover the latest and best practices, whether through new gadgets that improve the quality and safety of a project or innovative processes that reduce costs and improve efficiency.

Each year, Iowa LTAP sponsors a statewide Build a Better Mousetrap (BABM) Competition that provides a great opportunity for local agencies to share their new ideas with others.

We are looking for submissions from Iowa’s local public agencies (e.g., cities and counties) that have created different solutions to problems or found better ways of doing things. The top three winners are recognized statewide and are offered free workshop registrations.

Local agency employees can learn more about the competition and submit an entry at <https://iowaltap.iastate.edu/iowa-babm-competition/>. The deadline to submit an innovation is May 6, 2022.

Entrants must provide a photo of their invention, details on its cost and savings/benefits to the community, and offer background as to why and how the solution was developed. Videos of the equipment or innovation are encouraged. The entries will be judged on cost savings/benefit to the community, ingenuity, ease of transferability, effectiveness, and video demonstrations.

Jones County won the 2021 Iowa competition for its inventive shoulder maintenance

material-placement device. The county also earned national recognition from the FHWA in its Innovative Project category.

More details about previous Iowa winners are available here: <https://iowaltap.iastate.edu/iowa-innovations/>. ■



Jones County’s stone placement apparatus



In early and mid-November 2021, Iowa LTAP held its annual Winter Maintenance Workshop at six locations across Iowa, including (from left) Storm Lake, Hampton, West Union, Atlantic, Knoxville, and Washington. With over 240 participants, the workshops prepared local public agency employees on how to be ready for the winter season.

## 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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# In brief: Lasting LTAP impacts

The needs of our local agencies are always evolving. That is why, in 2022, the Iowa LTAP started offering a *virtual* option for our Basic Work Zone and Flagger training.

The subject material will remain primarily the same as the on-site training, which includes information on the proper use of personal protective equipment, work zone components and types of operations, flagging procedures, and proper and improper flagging operations, as well as methods of communicating with workers and the public.

However, with the online, virtual option, there will instead be six modules and a final quiz at the end of the training.

Registration is required, and the course itself will cost \$25 per person.

Once registered, you will be provided with video links and a final quiz link. You will have the opportunity to retake the final quiz as needed, as well. Do note that final automation of the online Basic Work Zone and Flagger training is still in development, as this is a new option of one of Iowa LTAP's popular services.

Once the course has been successfully completed, online attendees will receive an electronic “certificate card” for their use and as proof of training completion.

To learn more about this and other safety workshops, visit the Iowa LTAP's Safety Circuit Rider webpage at <https://iowaltap.iastate.edu/safety-circuit-rider/>. To register for the online Basic Work Zone and Flagger training, complete and submit the registration form at <https://iowaltap.iastate.edu/online-basic-work-zone-and-flagger-training-registration-form/>.

“We hope that this new approach will help our local agency employees get the training they need when they need it,” said Paul Albritton, LTAP technical training coordinator. “With a virtual option, those who can't attend the on-site training can now still participate.”

For questions or concerns, contact Paul Albritton at 515-294-1231 or [palbritt@iastate.edu](mailto:palbritt@iastate.edu). Don't forget to continue sharing your impact stories with us!

*Article written by Brandy Haenlein, a communication specialist with InTrans. ■*



Iowa LTAP's virtual Basic Work Zone and Flagger training is a new opportunity to get local agency employees the training they need as the spring construction season gets into full swing  
(F. Armstrong Photography/Shutterstock.com)

## Reminder: New CDL requirements in effect

As of February 7 of this year, the Federal Motor Carrier Safety Administration (FMCSA) has new training requirements for *first-time* commercial driver's license (CDL) applicants and certain drivers looking to upgrade their existing CDLs.

The new Entry Level Driver Training (ELDT) regulations are applicable to those entry-level drivers who are applying to do the following:

- Obtain a Class A or Class B CDL for the first time
- Upgrade an existing Class B CDL to a Class A CDL
- Obtain a school bus, passenger, or hazardous materials endorsement for the first time

The requirements are not retroactive, meaning those who already have a CDL and/or endorsement and are not looking to upgrade do not need to complete the training.

In Iowa, per the Iowa DOT, the Iowa DOT and all county treasurer's offices that issue CDLs will be required to verify a new CDL applicants' ELDT completion. Training providers are required to upload an individual driver's training certification to the FMCSA's Training Provider Registry.

### For More Information

- Training Provider Registry (includes training opportunities): <https://tpr.fmcsa.dot.gov/>

- FMCSA's CDL program and requirements: <https://www.fmcsa.dot.gov/registration/commercial-drivers-license>
- FMCSA's ELDT: <https://www.fmcsa.dot.gov/registration/commercial-drivers-license/entry-level-driver-training-eldt>
- Iowa LTAP webinar on the new CDL requirements and the FMCSA's Drug and Alcohol Clearinghouse: <https://iowaltap.iastate.edu/updates-on-cdl-drug-and-alcohol-clearinghouse-and-entry-level-driver-training-regulations/> ■

## Knapp earns ICEA Special Service Award



Iowa LTAP Director Keith Knapp got a pleasant surprise at the end of the ICEA Annual Meeting in December when it was

announced he received the organization's Special Service Award.

"It was nice after a long day of running during the conference," Knapp said.

The ICEA's Special Service Award is given to one to two individuals each year in recognition of their many contributions to the engineering profession and their continuing effort to bring credit to the field of county engineering. It honors those who have made contributions to ICEA, all county engineers, and the county engineering profession nationwide.

Knapp, who has led the Iowa LTAP for over a decade and has about 30 years of experience in transportation safety and design, was recognized for all the work

that he and the Iowa LTAP team have done, particularly the more recent efforts to hold virtual events and send out a resource newsletter during the pandemic.

Additionally, the award recognized Knapp for all his help with the ICEA events, including aiding with determining topics, selecting speakers, and behind-the-science work that help make the events so successful. ■

### APWA first-time membership discount

The national APWA is offering a half-price membership for new members. This membership provides access to 30,000 public works professionals with educational and networking opportunities. For more information, please go to <https://www.apwa.net/> and click on "Special Offers" under the "Membership" dropdown menu. For one year, the first-time individual membership cost is only \$111 (regularly \$222). Promotion ends December 31, 2022. ■

# CP Tech Center publishes *Quality Control for Concrete Paving* guide

“What gets measured gets managed” is a common adage in quality management.

Thus, the core of every successful quality control (QC) program for contractors and material suppliers is monitoring key quality characteristics and instituting a process for continuous improvement of those characteristics and of the QC process itself. QC is an integral component of a transportation agency’s quality assurance (QA) program and supports the construction of quality concrete infrastructure.

To help contractors develop or enhance their existing QC programs and plans and to familiarize agencies with the components of QC for concrete paving projects, the National Concrete Pavement Technology Center (CP Tech Center) recently published *Quality Control for Concrete Paving: A Tool for Agency and Industry*, available here: <https://cptechcenter.org/research/in-progress/advancing-concrete-pavement-technology-solutions/>.

“This document is intended to serve as a tool that can be used at the batch plant, behind the paver, and at other locations on the job,” reads the introduction to the guide.

The three authors of the guide are Tara L. Cavalline, PhD, PE, of the University of North Carolina at Charlotte; Gary J. Fick, of The Transtec Group, Inc.; and Al Innis, a consultant. The guide was published with funding from and as part of the Federal Highway Administration cooperative agreement Advancing Concrete Pavement Technology Solutions.

A key aim of the guide is to present the information necessary for contractors to do the following:

- Understand common agency QC requirements
- Develop and implement the appropriate tools, processes, and procedures to meet agency QC requirements



Hand finishing (The Transtec Group, Inc.)



Texturing machine (University of North Carolina at Charlotte)

- Develop and implement continuous improvement activities to more effectively and efficiently meet agency requirements
- Recognize that good quality control offers several benefits for contractors, including higher efficiency and productivity, increased profit, and safer operations

Though the primary target audience is contractors, the guide can also help agency personnel become familiar with the components and approaches that comprise a comprehensive QC plan for concrete paving projects, the ways such a QC plan benefits an agency, and ways to appropriately incorporate QC requirements into specifications.

Effective QC programs and plans are expected to become an increasingly important component of project QA as agencies move to implement performance-type specification provisions.

“Though agencies have various requirements for contractor QC during construction, they are only the minimum provisions that should be considered, and additional QC activities are almost always needed to ensure that risk is mitigated and a quality pavement is constructed,” said Cavalline.

However, the guide does not mandate that a contractor implement the outlined QC activities in a certain way.

“A successful contractor QC program engages the appropriate personnel, manages the necessary processes, measures what matters, and uses the appropriate test methods,” said Cavalline.

Complementary publications developed by the CP Tech Center include *Integrated Materials and Construction Practices (IMCP) for Concrete Pavement: A State-of-the-Practice Manual* (2019), *Guide to Concrete Overlays* (2021), and *Concrete Pavement Preservation Guide* (new edition forthcoming). These and other publications related to concrete paving are available on the CP Tech Center’s website, <https://cptechcenter.org/>. ■

# Workshop and conference calendar

[Information current as of March 22, 2022] Iowa LTAP will continue with holding both virtual efforts and in-person events and trainings throughout the spring.

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.

2022	Event Name	Location	Contact
<b>April</b>			
1	Research Series: Evaluating Driver Behavior at Rural Stop-Controlled Intersections	Webinar (12 p.m. CT)	Keith Knapp
5	AutoCAD Basics	Ames	David Veneziano
6–8	APWA Iowa Chapter Spring Conference	West Des Moines	Beth Richards
20	County Engineers Research Focus Group	Ames	Keith Knapp
25–May 6	Safety Inspection of In-Service Bridges (NHI 130055)	Ames	Paul Albritton
<b>May</b>			
3	Accessible Sidewalks and Curb Ramps: Design to Installation	Ames	Keith Knapp
3	Motor Grader Operator Workshop	Atlantic	Paul Albritton
10	Motor Grader Operator Workshop	Sigourney	Paul Albritton
17	Motor Grader Operator Workshop	Storm Lake	Paul Albritton
24	Motor Grader Operator Workshop	Independence	Paul Albritton
<b>June</b>			
1	Motor Grader Operator Workshop	Ames	Paul Albritton
7	Motor Grader Operator Workshop Field Days (2 sessions)	Ames	Paul Albritton
8	Motor Grader Operator Workshop Field Days (2 sessions)	Ames	Paul Albritton
9	Motor Grader Operator Workshop Field Days (2 sessions)	Ames	Paul Albritton
14–15	Local Agency Bridge Innovation and Demonstration Days	Independence	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/](https://iowaltap.iastate.edu/workshops/). ■

## Save the date

The 13th TRB International Conference on Low Volume Roads will be held July 23–26, 2023 in Cedar Rapids. The conference is convened by the Transportation Research Board and is a global forum to examine new technologies and new techniques in planning, design, construction, operation, maintenance, and administration of low-volume roads. A draft agenda is available here: <https://trb.secure-platform.com/a/page/lowvolumeroads>. Mark your calendars today. ■



Ben Hull

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