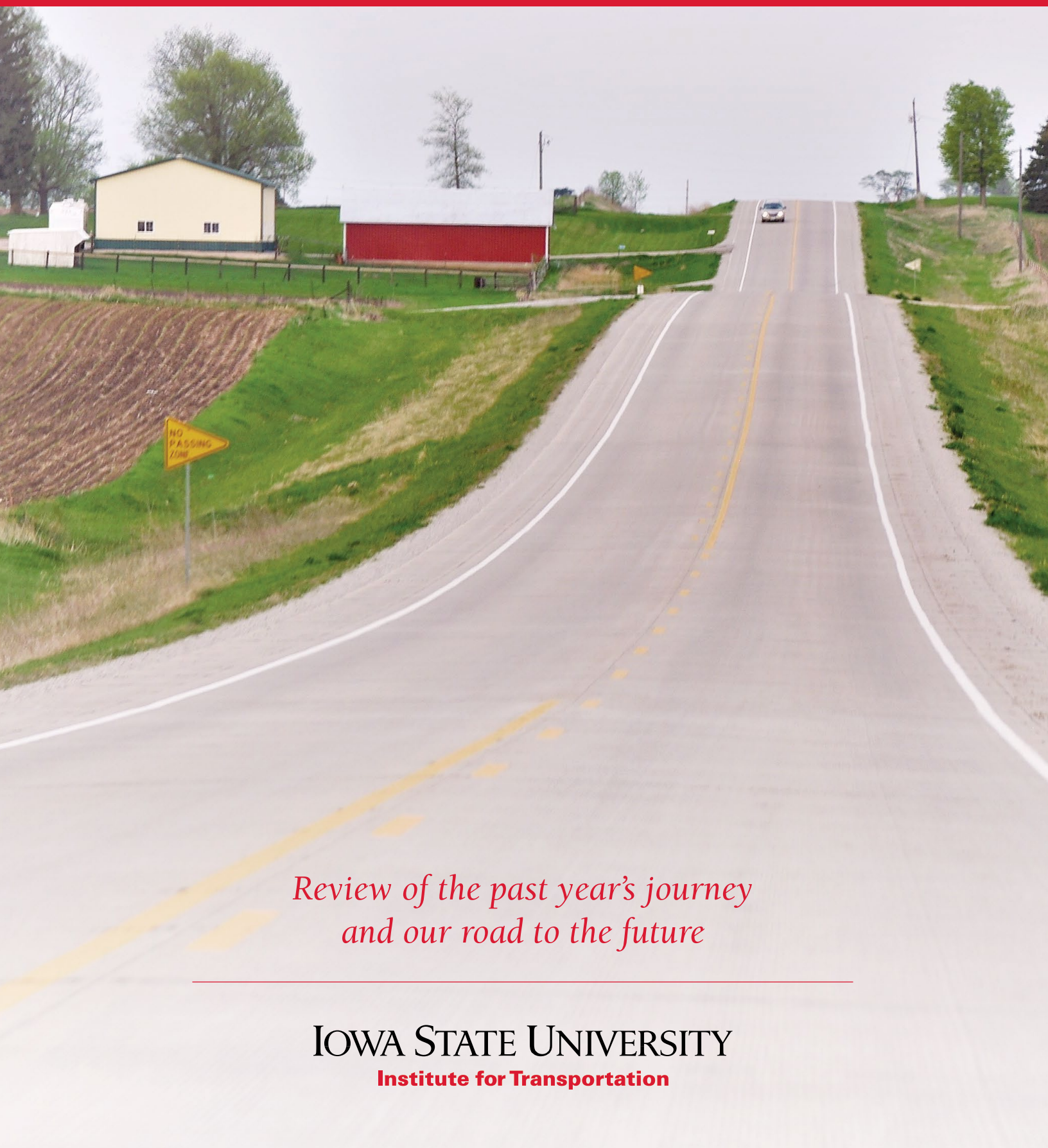


INTRANS EN ROUTE

ANNUAL REPORT

JANUARY 2020 TO DECEMBER 2020



*Review of the past year's journey
and our road to the future*

IOWA STATE UNIVERSITY
Institute for Transportation

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The Institute for Transportation (InTrans) at Iowa State University administers 15 centers and programs. From traffic safety to big data and from preservation to education, InTrans focuses on research and service that impact transportation now and into the future.

InTrans En Route is published by the Communications Department at the Institute for Transportation at Iowa State University.

Managing Editor: Oksana Gieseman; Writers: Brandy Haenlein and Christinia Crippes
Designer: Alicia Hoermann; Copyeditors: Monica Ghosh and Peter Hunsinger
Photos by Institute for Transportation staff and students except where noted

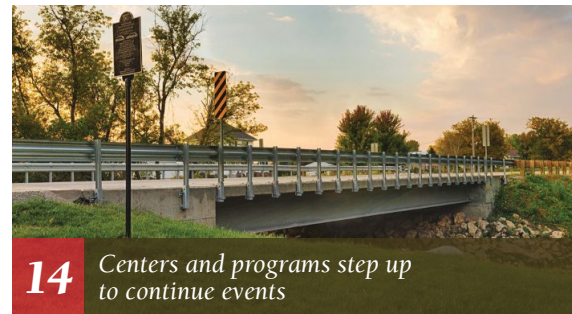
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12 Major accomplishments

Above photo by ACPA



14 Centers and programs step up to continue events

Above photo by Brian Keierleber, Buchanan County Engineer



16 InTrans 2020 event recap



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DIRECTOR'S MESSAGE



There are always obstacles on the road to success, sure, but I doubt that the outlook for 2020 could have been accurately predicted by anyone hazarding a guess. The impacts of the COVID-19 pandemic made 2020 the most challenging year yet for InTrans. Yet our proactive approach has ensured that everything didn't come to a crashing halt.

At the end of fiscal year 2020, the annual budget for work at InTrans was nearly \$18 million. Despite new pandemic challenges, InTrans has continued to deliver on all projects while still actively looking to the future by continuing to participate in collaborative research and proposal development. The dedication of our researchers and staff and, moreover, the confidence that state agencies, industry groups, and the federal government have in our ability to deliver new best practices, technologies, and results have never changed.

But the way that work is done has changed. Researchers and staff have shifted lanes to continue their work from home and have adapted to meet deadlines. InTrans has a committed and excellent staff that stepped up and supported each other during the transition—from moving to online-only workshops and webinars to conducting research with new social distancing requirements to simply being considerate during dropped Zoom calls.

We currently collaborate with over 30 faculty members from the Iowa State University College of Engineering, and we employ another 75 research scientists, traffic engineers, and professional staff. They are supported by 106 graduate and 78 undergraduate students who work on a variety of research and demonstration projects under the guidance of InTrans staff. In a year when large groups couldn't gather, we are thankful for everyone's dedication to working together, separately.

One of our largest hurdles in 2020 was the transition to virtual communication. Still, InTrans' centers and programs organized and held more than 70 virtual events during this unprecedented year, a few of which are highlighted in this report. The move was difficult, but it has allowed the opportunity for new and expanded partnerships and involvement, as distance became no longer a hurdle for participation. There is always an opportunity for growth.

We published 33 technical reports on completed projects, as well as 29 tech transfer summaries, 14 tech briefs, and 2 guides, all available for download on the InTrans website. In fact, in this report we highlight COVID-19-related research currently being done by InTrans' Associate Director Neal Hawkins and myself. Funded by the Minnesota Department of Transportation, our focus is on analyzing the impacts that the pandemic has had on speed and safety on rural roads.

Looking forward, InTrans will continue being resilient and adaptable. Our efforts in 2020 are ongoing, and new projects are on the horizon. There may be more challenges to face and new projects to start, but together—although separately—let us celebrate all that we have achieved so far. ■

Shauna Hallmark
Director, Institute for Transportation
Professor, Department of Civil, Construction,
and Environmental Engineering
Iowa State University

VISION

**Translating science for
decision-making**

MISSION

**Saving lives and improving economic vitality through discovery,
research innovation, outreach, and the implementation of bold ideas**

CENTER AND PROGRAM HIGHLIGHTS

Asphalt Materials and Pavements Program (AMPP)

Director: Chris Williams

The Asphalt Materials and Pavements Program (AMPP) is the leading state and regional asphalt materials and pavements educator, research provider, and technology transfer program. AMPP participates in national and international research and technology transfer.

In partnership with academia, state and local transportation agencies, the asphalt paving industry, and material suppliers, AMPP is leading research to improve the quality and performance of asphalt materials and pavements.

In 2020, AMPP participated in many demonstration paving projects utilizing multiple biotechnologies across the US, including in Iowa, Wisconsin, Missouri, Indiana, Illinois, and Massachusetts. AMPP also completed a multiphase project for the Iowa Department of Transportation (DOT) that involved holding strategies for low-volume roads, which tend to deteriorate to a point where traditional pavement preservation is not possible, usually because sufficient funding is not available. In another project for the Minnesota DOT, AMPP researchers determined how void-reducing asphalt membrane (VRAM) impacts deterioration at longitudinal joints.



AURORA Program

Director: Zach Hans

The Aurora program is a partnership of highway agencies that collaborate on researching, developing, and deploying road weather information to improve the efficiency, safety, and reliability of surface transportation. Eighteen state DOTs participated in Aurora during 2020.

Two Aurora research projects were completed during 2020, and seven additional projects were either funded or are ongoing. Aurora research topics are quite diverse, including seasonal weight restrictions, road weather information system (RWIS) life-cycle cost analysis, optimal RWIS siting, noninvasive sensors, atmospheric rivers, snow/ice detection via infrared thermography, winter weather severity indices, and roadway friction modeling.

Due to COVID-19, the Aurora spring and fall board meetings were held virtually. Monthly Aurora meetings were also held to conduct business; facilitate agency discussion regarding current practices, challenges, and solutions; and provide an opportunity for researchers and vendors to present their work and evolving technologies.



Centers and programs continued on page 5

Bridge Engineering Center (BEC)

Acting Director: Katelyn Freese

The Bridge Engineering Center (BEC) focuses on maintaining and improving bridge infrastructure assets through new construction approaches, new materials, better inspection approaches, better management philosophies, and the development of bridge preservation techniques.

2020 was a year of continued close partnership with the Iowa DOT. Many ongoing projects were completed, despite minor delays in field and laboratory work due to COVID-19 restrictions. Strides were also made to expand the autonomous structural health monitoring network (the Bridge Engineering Condition Assessment System [BECAS]) across the region.

On a national scale, the BEC's ongoing involvement with the Accelerated Bridge Construction (ABC) University Transportation Center brought about new research projects focusing on novel ABC techniques and materials. The BEC also continues to partner with state agencies across the US and the Federal Highway Administration (FHWA) to complete projects covering topics spanning from load rating best practices to timber bridges.



Center for Earthworks Engineering Research (CEER)

Interim Director: Vernon Schaefer

The Center for Earthworks Engineering Research (CEER) is committed to solving earthworks engineering and construction problems by working with industry and government agencies to define, prioritize, and conduct a strategic program of research and education.

CEER's focus on earth mechanics and the creation of innovative technologies, sensors, and systems remained the same in 2020, despite new COVID-19 restrictions on project sites. In fact, CEER researchers finished two long-term projects during that time.

First, a Granular Roads Asset Management System was developed for the Iowa DOT. This system will assist local agencies in making more reliable gravel loss estimates and consequently determining annual aggregate requirements for budgeting purposes. Second, working with five state DOT partners as well as the FHWA, CEER research on improving the foundation layers for concrete pavements yielded conclusive findings that will go on to help make pavement foundations more durable, uniform, constructible, and economical.



Centers and programs continued on page 6

Center for Transportation Research and Education (CTRE)

Director: Omar Smadi

The Center for Transportation Research and Education (CTRE) performs transportation-related research and outreach focused on safety, asset management, operations, and planning.

Despite obstacles and new challenges in 2020 due to COVID-19, the CTRE team was able to successfully complete multiple research projects, which included supporting the Iowa DOT and Iowa State Patrol with state-level COVID-19 traffic operations and data analytics, enhancing tools that support statewide safety, and developing various innovative work zone performance and awareness tools.

CTRE was also able to pursue some exciting new endeavors. In 2020, the center won three major projects through the FHWA's Infrastructure Asset Management Initiative that, through future research, will enable the CTRE team to optimize the performance and cost-effectiveness of transportation facilities in an effort to maintain, upgrade, and expand physical assets throughout their life cycles.



Center for Weather Impacts on Mobility and Safety (CWIMS)

Director: Zach Hans

The Center for Weather Impacts on Mobility and Safety (CWIMS) focuses on understanding and mitigating the impacts of weather on surface transportation.

During 2020, CWIMS continued to support researchers investigating the impacts of weather on transportation and administered the Aurora Pooled Fund. Two Aurora projects were completed, and seven additional projects were either funded or are ongoing.

CWIMS researchers are supporting the Iowa DOT to incorporate weather metrics into operational decision-making and the evaluation of crash causation. They are also supporting the Iowa DOT by implementing the Pikalert System, which incorporates vehicle-based measurements of the road and surrounding atmosphere with other, more traditional, weather data sources to create road condition forecasts and alerts up to 72 hours in advance for all Iowa DOT roadways. Lastly, CWIMS is working on an Aurora large-scale deployment of noninvasive road sensors adjacent to existing invasive sensors to report agreement between the different systems. This project involves 16 states, 65 sensors, and 51 existing RWIS sites.



Centers and programs continued on page 7

Construction Management and Technology (CMAT) Program

Director: Jennifer Shane

The Construction Management and Technology (CMAT) program conducts work related to the delivery of transportation systems from development through construction, with a focus on construction aspects.

In 2020, CMAT continued working on FHWA and Iowa DOT projects. Specifically, work continued on the 2016 FHWA Work Zone Training grant on post-construction project evaluation. CMAT also completed a multiyear project offering supportive services for disadvantaged business enterprises for the Iowa DOT.

CMAT began working on several NCHRP projects in 2020, including an investigation of valuation and compensation for accommodating utility and communications installations in public rights of way and a synthesis on the implementation of subsurface utility engineering for highway design and construction.



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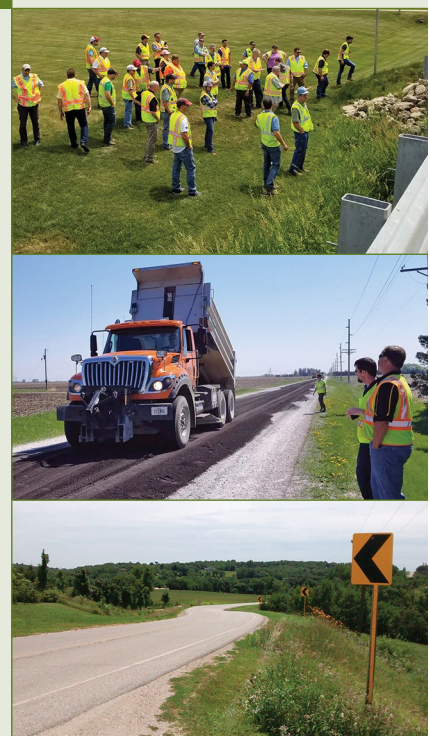
Iowa Local Technical Assistance Program (Iowa LTAP)

Director: Keith Knapp

The Iowa Local Technical Assistance Program (Iowa LTAP) provides training and technical assistance to local transportation agency staff and those who work with them.

During 2020, the LTAP team adjusted the approaches it took due to the COVID-19 pandemic. On-site instruction stopped after February and was replaced with online training. A weekly webinar series was introduced, and virtual “live” workshops were scheduled regularly. In addition, a hybrid (some attendees on-site and others virtual) day-long conference was also organized and held. More than 4,500 people took advantage of Iowa LTAP’s “live” and recorded trainings.

The amount of information provided to local agencies about available online training was also increased with the introduction of a biweekly resource listing. Iowa LTAP’s technical assistance, equipment loans, and road safety reviews were also adjusted during COVID-19 and continued to be completed.



Centers and programs continued on page 8

Iowa Statewide Urban Design and Specifications (SUDAS)

Director: Paul Wiegand

The Iowa Statewide Urban Design and Specifications (SUDAS) program promotes uniformity of urban design and construction across Iowa.

SUDAS staff quickly changed gears due to the COVID-19 pandemic and conducted meetings virtually rather than face-to-face. Committee members have been receptive to this change, which has resulted in record-breaking attendance. Numerous changes and updates were implemented in the SUDAS manuals in late 2020.

SUDAS staff also prepared and submitted a proposal to spearhead a new project: the Iowa Public Works Service Bureau. The proposal was presented to the Iowa Highway Research Board in January 2021 and was approved. SUDAS staff will hit the ground running to start this new adventure.



Midwest Transportation Center (MTC)

Director: Shauna Hallmark

The Midwest Transportation Center (MTC) has focused its research on data-driven performance measures of transportation infrastructure, traffic safety, and project construction. The MTC was one of ten regional University Transportation Centers sponsored by the U.S. Department of Transportation Office of the Assistant Secretary for Research and Technology (USDOT/OST-R).

Funded by the 2012 federal transportation bill, the Moving Ahead for Progress in the 21st Century Act (MAP-21), the MTC's research focus area was "State of Good Repair," a key program under MAP-21.

In 2020, research was completed that aligned with MAP-21 and its requirement that state transportation agencies incorporate risk-based management into their planning for preventative maintenance, replacement, or rehabilitation of their bridge networks. Looking specifically at scour risk for Iowa bridges, a set of three modifications to HYRISK—software used by the Iowa DOT—was investigated. These modifications enable improvement for both network- and project-level management of scour risk.



Centers and programs continued on page 9

National Center for Wood Transportation Structures (NCWTS)

Acting Director: Justin Dahlberg

The National Center for Wood Transportation Structures (NCWTS) helps agencies efficiently utilize naturally sustainable forest resources in appropriate transportation structures.

During 2020, the NCWTS was able to maintain ongoing research projects with its collaborative partner, the United States Department of Agriculture (USDA) Forest Products Laboratory. An example includes the field evaluation of seven stress-laminated hardwood timber bridges after more than 25 years in service and the initiation of two studies: (1) identification of research needs for timber transportation structures and (2) a laboratory investigation of cross-laminated decks for bridge applications.

Opportunities to promote the use of wood in transportation came through collaborative meetings with industry partners at the National Alliance of Forest Owners with the goal of being able to explain the merits of wood in transportation construction in a succinct and simple way to those unfamiliar with transportation structures. The NCWTS also participated in the Association for Preservation Technology's International Student Design-Build Competition through presenting previous research on covered timber bridges.



National Concrete Pavement Technology Center (CP Tech Center)

Director: Peter Taylor

The National Concrete Pavement Technology Center (CP Tech Center) is focused on discovering and implementing best practices for the design, construction, and maintenance of concrete pavements. The CP Tech Center aims to be at the nexus of agencies, industry, and academia, providing information to, and learning from, all three groups.

When travel was shut down due to COVID-19, the CP Tech Center moved to conducting work online, including national webinars in collaboration with the American Concrete Pavement Association (ACPA) that reached 12,000 people last year and continue with approximately 650 people attending each session.

A cooperative agreement with the FHWA has enabled the CP Tech Center to continue its work of developing guidance documents, training sessions, and videos that help practitioners across many walks of life build better pavements.

CP Tech Center research is ongoing into understanding the effects of vibration on concrete mixtures, developing sustainable concrete mixtures, and constructing long-lasting overlays with and without fibers in the mixtures.



Centers and programs continued on page 10

Program for Sustainable Pavement Engineering and Research (PROSPER)

Director: Halil Ceylan

The Program for Sustainable Pavement Engineering and Research (PROSPER) is instrumental in advancing research, education, and technology transfer in the area of sustainable highway and airport pavement infrastructure systems.

Despite the uncertainty and challenges associated with the COVID-19 pandemic, the PROSPER team was able to successfully work on over 25 funded research projects in 2020. This included developing various innovative pavement data collection and analysis tools for Iowa county engineers, supporting the Iowa DOT by facilitating the implementation of the latest version of AASHTOWare Pavement ME Design, studying and documenting the long-term impact of curling and warping on Iowa concrete pavement systems, and implementing Otta seal surfacing technology on Iowa's low-volume roads.

In 2020, PROSPER was awarded five major research projects. Through these newly awarded and highly competitive projects, the team is currently exploring the development of cutting-edge technologies to be implemented in transportation infrastructure engineering applications.



Real-Time Analytics of Transportation Data (REACTOR) Laboratory

Codirectors: Anuj Sharma, Neal Hawkins, and Skylar Knickerbocker

The Real-Time Analytics of Transportation Data (REACTOR) Laboratory serves as a focal point for traffic operations research. Operating under InTrans' CTRE, the lab's research team is developing technology to transform continual data streams into decision support and solutions.

REACTOR lab faculty, staff, and students were able to rise above the unprecedented issues faced in 2020 to support the Iowa DOT within the first three months of the pandemic on a number of COVID-19-related tasks. These ranged from considering transportation access to critical hospitals/facilities to considering opportunities to accelerate road work zone activities. The team also began developing a unique tool for the Iowa State Patrol that promotes understanding of both enforcement activities and roadway safety performance trends.

The REACTOR lab began in 2013 with the aim of serving as a focal point for supporting the Iowa DOT's Operations Division. Since its inception, this work has been expanded through projects for the FHWA, National Science Foundation (NSF), and industry.

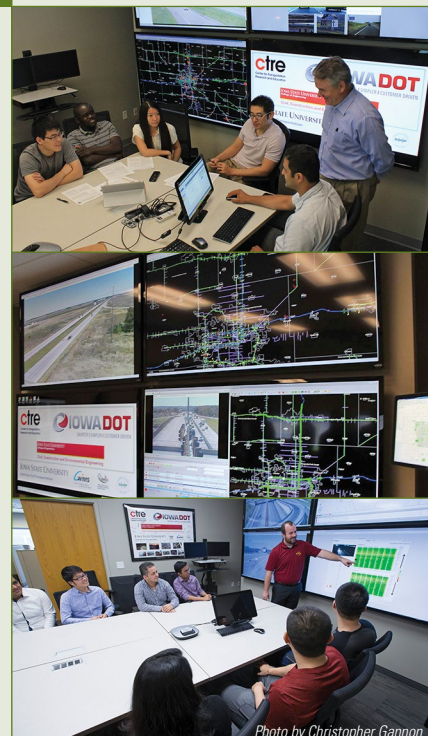


Photo by Christopher Gannon

Centers and programs continued on page 11

Smart Work Zone Deployment Initiative (SWZDI)

Director: Keith Knapp

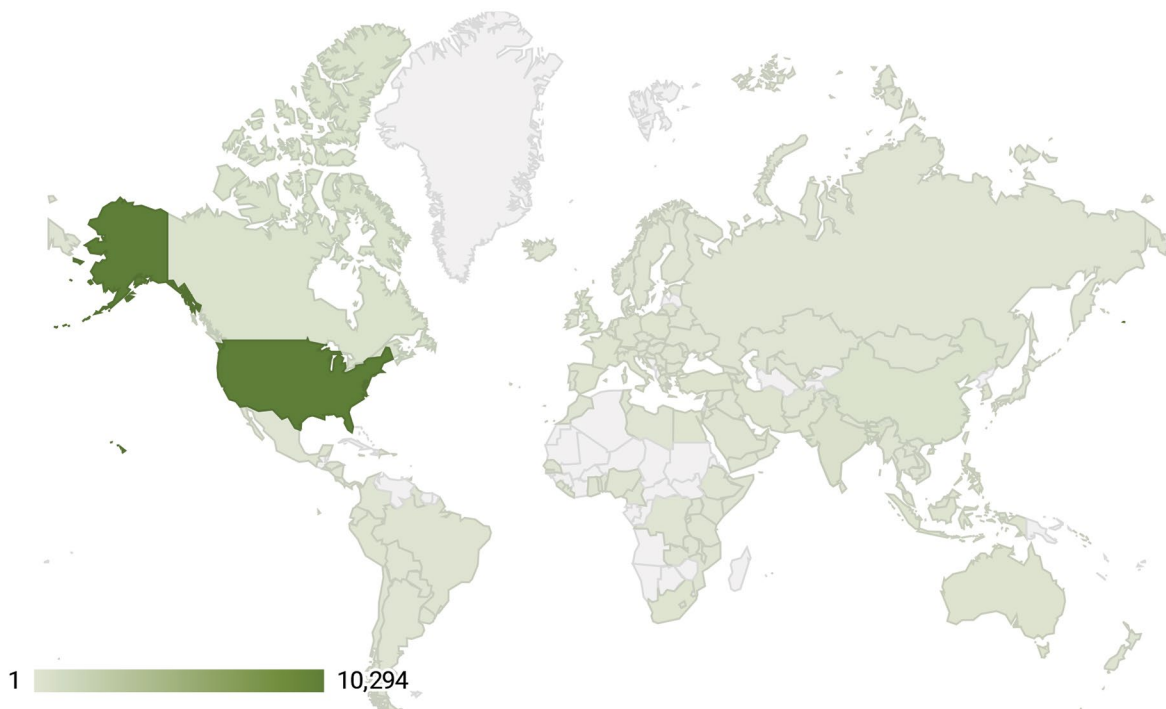
The Smart Work Zone Deployment Initiative (SWZDI) is a pooled fund effort with eight participating states. It supports research and outreach activities that focus on innovative practice-ready policies, processes, tools, and products that enhance the implementation and constructability, safety, mobility impacts, and/or operation of all types of work zones.

During 2020, the pooled fund collected problem statements from researchers and released an RFP focused on four subjects. These subjects included work zone lighting, methods to increase vehicle spacing, speed limits and motorist compliance, and public side street control for one-lane two-way work zones. A review and ranking of the proposals submitted resulted in two projects being selected for funding. Two additional SWZDI-funded research projects were completed in 2020 and their project reports posted online. There are also six ongoing SWZDI projects.



Adam Kenneth Campbell/Shutterstock.com

SPOTLIGHT ON INTRANS WEBSITE TRAFFIC



MAJOR ACCOMPLISHMENTS

The way we did business in 2020 changed, but the work we did continued the same as every year. It was often a challenge, but after the brief standstill that struck at the onset of the pandemic in mid-March, everyone at InTrans kept up their work as usual, even if they weren't at work as usual.

InTrans took a proactive approach to the pandemic. Most staff were able to work from home throughout the remainder of 2020 after COVID-19 began to impact Iowa. However, once more guidance was available to keep employees safe, staff came back on site in the limited capacity of 30 percent. The transition wasn't always easy, but everyone worked together to keep business flowing.

In an unprecedented year, InTrans staff stepped up to deliver unprecedented accomplishments

that met critical needs in continued service to our clients and to one another—including those highlighted as follows.

COVID-19 RESEARCH AND RESPONSE

In addition to the health challenges presented by COVID-19, the transportation industry has been forced to address new issues. Like at InTrans, work in transportation more broadly has never stopped, but we are using the same data to address novel issues brought on by the pandemic.

Iowa DOT—Data Analysis Needs

Traffic patterns changed and awareness of essential routes spiked in an instant. To aid the Iowa Department of Transportation (DOT) in adapting to the new situation and provide operational support to the Iowa State Patrol, the REACTOR Laboratory has created several tools to provide a deeper understanding of the pandemic's impacts on transportation.

This has included mapping critical facilities and travel routes. Real-time data are being used to evaluate changes in traffic volumes through 2020. The evaluation of traffic count data helped provide the Iowa DOT with localized traffic impacts and thus aid in the decision-making process for optimal working hours for lane closures on construction projects. Overall, traffic was down about 18 percent for all road types in 2020 from the onset of the pandemic.

However, just because traffic was down, it didn't mean there was a decrease in safety concerns.

Accomplishments continued on page 13

PROJECT SPOTLIGHT



National Concrete Pavement
Technology Center



CP TECH CENTER/FAA AGREEMENT TAKES OFF

The pandemic was at the forefront of our minds in 2020, but there was plenty of work to do unrelated to it that continued, as our clients have come to expect. Though the project is set to continue for years, the CP Tech Center reached an agreement in 2020 with the Federal Aviation Administration (FAA) that will have a large impact.

Per the agreement, the CP Tech Center will administer wide-ranging design, materials, and construction research contracts for the new Airport Pavement Technology Program (AFTP) over the next five years.

The CP Tech Center and FAA, with substantial help from the American Concrete Pavement Association (ACPA), signed the \$3.5 million cooperative agreement in late September. The \$3.5 million agreement was funded with \$500,000 more than originally asked, thanks to the efforts of the ACPA. ■

MnDOT—COVID-19 Speed and Safety Impacts

InTrans Director Shauna Hallmark and Associate Director Neal Hawkins responded to a request for proposals from the Minnesota DOT (MnDOT) seeking research to better understand the roadway impacts of the pandemic. Their funded research project “COVID-19 Impacts on Speed and Safety for Rural Roads and Work Zones” got underway this past fall.

Reduced traffic volumes and the pandemic’s added strain on enforcement agencies appears to be inciting higher speeds and more aggressive driving. To address these issues, the InTrans research team will document the differences in speed and volume along selected MnDOT rural corridors and work zones prior to and during the COVID-19 pandemic.

The results will help quantify the differences in travel speeds due to lower traffic volumes and COVID-19 conditions. This information will support agency decision-making in terms of potential countermeasures, enforcement, and messaging strategies.

Trainings and Conferences

Because work did not stop for transportation agencies, neither could efforts to provide training and educational events.

The transition from holding hundreds of in-person events attracting thousands to moving those trainings and conferences into the virtual environment was no small feat. It was, however, undertaken with speed and savvy, particularly by Iowa LTAP and the CP Tech Center.

“Some efforts are going to virtual and may stay virtual, other efforts may be hybrids, and others still will likely go back to being face-to-face at some point,” LTAP Director Keith Knapp explained this past summer. “This is a difficult time, but we will continue to serve. I want to look back at this period and know we did everything we could.”

To read more about how InTrans adapted to the new ways of holding events, turn to page 14. ■



Wapello County bridge construction in 2005



BEC RESEARCH FEATURED ON PBS

Filmed and released prior to the pandemic, the PBS *NewsHour* program featured research that the Bridge Engineering Center (BEC) has done on ultra-high performance concrete (UHPC) use in bridges, particularly focusing on their work in Buchanan County, Iowa.

The five-minute video featuring BEC staff and students aired in February 2020 as part of the program’s “Breakthrough” series that looks at emerging technologies.

The BEC worked with the Iowa DOT in 2006 to use UHPC on a bridge deck overlay project in Wapello County, the first in the US. As the *NewsHour* piece by Cat Wise notes, there are now 9 bridge projects using UHPC in Iowa, and UHPC has been used in bridge projects in 28 states and Washington, DC. ■

CENTERS AND PROGRAMS STEP UP TO CONTINUE EVENTS

Events across the world looked different in 2020 as we all became accustomed to virtual attendance.

InTrans held about a half dozen events in person in 2020 before the pandemic caused a flurry of cancellations in mid-March. However, it didn't take long for InTrans' centers and programs to adapt to the changes.

Throughout the course of 2020, InTrans' centers and programs organized and held more than 70 virtual events. With the ability to attract attendees not just nationwide but worldwide, InTrans audiences have expanded beyond the bounds of our usual reach.

"Great presentations—well done and good night!" read feedback from one CP Tech Center webinar attendee in Australia.

InTrans' increase in virtual events has also allowed for new and expanded partnerships.

The CP Tech Center's Concrete Pavement Technology Tuesday webinar series, for example, has been conducted in conjunction with the American Concrete Paving Association. Iowa LTAP has organized a guest speaker series that has allowed InTrans researchers—and others from outside organizations—to share their research more widely.

Attendees have not hesitated to share their gratitude with organizers and presenters alike.

"Please pass on my thanks to everyone who was involved with preparing & presenting the webinar, it was great, I learned a lot!!" read feedback from an Iowa LTAP weekly webinar attendee.

InTrans events continued on page 15



Completed Buffalo Creek Bridge in Buchanan County (Photo by Brian Keierleber, Buchanan County Engineer)



It may be hard to recall now as we've settled into our new normal, but the uncertainty that began at the outset of the pandemic was still very much a factor for the few months that followed.

That ongoing uncertainty and a desire to get back to typical events meant a lot of internal and external discussion about the setting for **Iowa LTAP's Local Agency Bridge Innovation and Demonstration Days** held in June.

The national event had been held two years before, and the requests for a reoccurrence had been on track to be fulfilled due to funding from the Iowa DOT and FHWA. After surveys of registered attendees and speakers as well as assessment of the pandemic situation at the time, the event was reworked to go fully virtual.

The event moved from two days in person to three two-hour sessions online, and its focus shifted from training to demonstrations. However, it still included three presentations each day covering national, state, and local perspectives on various bridge-related subjects. The event also still managed to include a tour of Buchanan County's bridges, albeit in a virtual format.

While it was a challenge to make the changes, it allowed the event to welcome 150 participants from over 10 states, rather than the 45 that were welcomed in person in 2018. ■

The virtual setting has also allowed organizers to more easily track attendees, presenters, and other key details:

- Iowa LTAP training events hosted and delivered between January and mid-March attracted 455 attendees. Live webinar attendees during the remainder of 2020 totaled more than 2,700, including those who watched recorded versions at their own pace. Conference attendees totaled another 850 in-person participants.
- The CP Tech Center's webinar series on concrete overlays attracted between 630 and 770 participants for each of its five weeks, with its total reach exceeding 1,500 individual people. A total of 161 attendees joined all five sessions.
- The CP Tech Center's Americans with Disabilities Act (ADA) compliance series and its pavement preservation series each had more than 1,000 unique attendees. The two-session ADA compliance series reached a total of 1,500 participants, and the four-session pavement preservation series reached a total of nearly 2,500 participants.

The virtual setting necessitated by COVID-19 has also allowed organizers to record the sessions in most cases, which means that they are still available to watch today. The CP Tech Center's webinars and handouts are available here:

cptechcenter.org/webinars-and-videos/. The Iowa LTAP webinars are available here: iowaltap.iastate.edu/webinars/.

Unfortunately, however, some events were not able to be transitioned into a virtual format in 2020, but planning is already underway to reschedule those events in 2021 or 2022.

"I can't imagine the work you and your staff have put into planning conferences this year only to have everything canceled at the last minute. I personally want to thank you and everyone involved for the work you do," read a comment after the Iowa County Engineers Association Annual Meeting was called off in 2020. ■



National Concrete Pavement
Technology Center



The **Iowa Better Concrete Conference** is typically held the second Thursday of November each year. COVID-19 changed that in 2020.

The CP Tech Center worked to transition this event to a virtual format by hosting a series of four webinars during November and December. The event's annual Iowa Excellence in Concrete Awards from the Iowa chapter of the American Concrete Institute were also presented virtually.

The change in format not only recognized the ongoing pandemic but also offered a chance to expand the conference's reach. In 2019, the event had attracted a total of about 140 mostly in-state participants. **The virtual format compelled by the pandemic meant that the event in 2020 attracted over 300 unique webinar attendees overall from 18 states and British Columbia.** Attendance at each of the four webinars varied from 150 to nearly 200 people.

Because of the change in form, the webinar presentations for this year's event were recorded and are available for watching or re-watching here: cptechcenter.org/past-events/iowa-better-concrete-conference/. ■

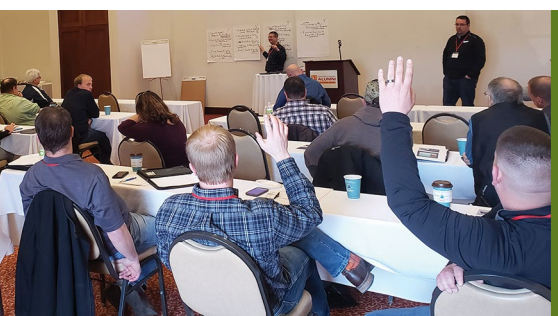
INTRANS 2020 EVENT RECAP

IN-PERSON EVENTS

Avoiding and Managing Construction Contract Claims (Jan. 7–9, 2020)
 Bridge Inspection Refresher Training (Feb. 11–13, 2020)
 Modern Roundabouts: Intersections Designed for Safety (Feb. 18, 2020)
 AutoCAD Basics (Feb. 19, 2020 and March 11, 2020)
 Culvert and Bridge Backwater Program Workshop – Ames (Feb. 25, 2020)
 County Engineers Research Focus Group (Feb. 26, 2020)
 Work Zone Safety Workshop – Ames (March 9, 2020)



It was a busy winter for Iowa LTAP, with events that included the Modern Roundabouts: Intersections Designed for Safety course (top) and the Culvert and Bridge Backwater Program Workshop (bottom)



County engineers got together on Feb. 26 to express and vote on ideas for potential future research topics

VIRTUAL IOWA LTAP EVENTS

Introduction to Work Zone Crash Modification Factors
 You OK? Suicide Prevention Campaign for the Workplace
 Stress Management Basics (Held twice)
 Local Road Safety Plan Do-It-Yourself Website Overview
 Winter Maintenance Operations Workshop
 Ethics in Engineering
 Reading the Road for Safety
 Virtual Local Road Safety Workshop
 Excavation Safety (Virtual)
 Incorporating Safety into Projects
 Addressing Work Zone Speed and Safety
 Effective Communication in Work Gone Virtual
 Countermeasures for Pedestrian Safety
 OSHA's Here, Now What?
 Chainsaw Safety Overview
 Road Diet Overview
 Validation of Adjustment Factors for Freeway Work Zone Capacity Calculations
 Hear from "The Voice of the Kansas City Chiefs"
 Improving Safety through Vegetation Control and Maintenance of Drainage Features
 Working with Heated Pavements—Recent Technical Advances
 Ethical Choices—What Would You Do?
 Improving Work Zone Safety: Temporary Rumble Strips, Smart Arrow Boards, and Other Connected Traffic Control Device Technologies
 Leadership Skills—Team/Group Development and Organizational Self-Assessment
 A Local Agency Perspective on Automated Traffic Signal Performance Measures
 Building Intelligence for Next Generation Traffic Management
 ICEA Mid-Year Conference (Partial virtual, partial in-person)
 Everything You Wanted to Know about Concrete but Were Afraid to Ask
 Local Agency Bridge Innovation and Demonstration Days
 Roundabout Virtual Town Hall Series
 MoGO Town Hall
 Roadside Safety Basics
 APWA Spring into Summer
 CityPCI—A New Approach to Calculating Pavement Condition Index (PCI) for Local Agencies
 Health Hazards for Roadway Workers
 MUTCD Signing Review
 Effectiveness of Pavement Preservation
 New and Innovative Uses of Unmanned Aircraft Systems in Transportation Infrastructure Health Monitoring and Management
 Evaluation of Vehicle-Activated Stop Sign Beacons
 Remaining Resilient during Challenging Times
 Maintenance Safety Signs and Sign Supports
 Work Zone Reviews: The Good, the Bad, and the Ugly
 City Research Focus Group
 Accessible Sidewalks and Curb Ramps: Design to Installation
 Confined Space Safety Overview
 Low-Cost Safety Improvements
 Work Zone Safety and Flagger Online Training
 Excavation Safety Overview

455

IN-PERSON
ATTENDEES
AT IOWA LTAP
TRAININGS

2,700+

IOWA LTAP
LIVE WEBINAR
ATTENDEES

850

IN-PERSON
ATTENDEES
AT IOWA LTAP
CONFERENCES

2020 event recap continued on page 17

VIRTUAL CP TECH CENTER EVENTS

Concrete Paving Best Practices Webinar Series

- Life-Cycle Cost Analysis in Pavement Design Webinar
- Concrete Roundabout Design and Construction Webinar
- Resiliency/Resilient Pavement Systems Webinar
- Joints Webinar

Real-Time Smoothness (RTS) Webinar Series

- Achieving Smoothness in Concrete Pavement Construction

Concrete Pavement Preservation Webinar Series

- Concrete Pavement Management and Preservation
- Concrete Pavement Evaluation and Preservation Strategy Selection
- Concrete Pavement Preservation Treatment Construction
- Concrete Pavement Management and Preservation Performance Resources

Americans with Disabilities (ADA) Compliance Webinar Series

- ADA Guidelines for DOT and Municipal Project Planning and Design
- How States are Implementing PROWAG
- ADA Quick Reference Guide for Design and Construction Personnel

Concrete Overlays Webinar Series

- Introduction to Concrete Overlays
- Concrete Overlay Design
- Concrete Overlays Plans, Maintenance of Traffic, and Construction
- Overlays Overview, Existing Pavement Evaluation, and Overlay Selection
- Maintenance of Concrete Overlays and Available Resources

Concrete Pavement Lunch & Learn Webinars

- Durable Concrete in a Low-Ash World (Fall 2020)
- Basics of Concrete Paving Construction and Inspection (Spring 2020)
- How Proper Design and Construction Practices Can Produce Long-Life Pavements (Winter 2020)

Concrete Pavement Thickness Design and Slab Geometry

Fall 2020 National Concrete Consortium Webinars (Sept. 1–3, 2020)

Iowa Better Concrete Conference (Held throughout December)

OTHER VIRTUAL EVENTS

Aurora Spring Board Meeting ■

1,500+

INDUSTRY PRACTITIONERS REACHED FROM CP TECH CENTER'S FIVE-WEEK CONCRETE OVERLAY WEBINAR SERIES

70+

VIRTUAL EVENTS HELD BY INTRANS' CENTERS AND PROGRAMS

2,500

PARTICIPANTS REACHED FROM CP TECH CENTER'S FOUR-SESSION PAVEMENT PRESERVATION WEBINAR SERIES

Recordings for most events are available online. The available CP Tech Center webinars are accessible here: cptechcenter.org/webinars-and-videos/. The available Iowa LTAP webinars are accessible here: iowaltap.iastate.edu/webinars/.



National Concrete Pavement Technology Center



Within just a few short weeks of Iowa State University's shutdown of in-person events due to the pandemic, the CP Tech Center had organized a five-week webinar series that exceeded all expectations.

The **concrete overlay webinar series** ran from April 7 to May 5 and enjoyed unprecedented success with 630 to 770 weekly participants. **In total, the series impacted over 1,500 practitioners from state agencies, local agencies, industry, consultants, and academia.** Of those attendees, 161 joined all five sessions.

The series would go on to set the standard for how the CP Tech Center has conducted many of its virtual events since—ongoing series that have attracted hundreds each week and thousands overall.

The first two videos in the overlays series—an introduction to concrete overlays as well as guidance on evaluating existing pavement and selecting an appropriate overlay—have been the most watched InTrans webinar recordings since the pandemic began. The introduction video has reached an additional 500+ people since it was posted. ■

PUBLICATIONS AND PATENTS

One way to grasp the depth and breadth of work conducted by InTrans faculty, staff, and graduate students is to scan the lists on the following five pages.



Longitudinal guardrail protecting a signal mast in Elkhart, Iowa

Project: In-Service Evaluation of Railroad Signal and Stop Arm Pole Protection



Queue warning sign for oncoming highway traffic to read

Project: Assessing Driver Behavior at Back of Queues: Implications for Queue Warning System in Work Zones



Iowa DOT snoop truck inspecting Salix Interchange Bridge in Woodbury County, Iowa

Project: Evaluation of the Performance of A1010 Bridge Steel

These deliverables were the products of research efforts that spanned all aspects of the nation's transportation system: pavements, bridges, traffic safety, work zones, data analytics, low-volume roads, and more. Copies of the reports listed below are available for download from the InTrans website at intrans.iastate.edu/research/completed/.

INTRANS TECHNICAL REPORTS

OCTOBER–DECEMBER

Demonstration and Inter-Comparison of Seasonal Weight Restriction Models – Phase II

Rapid Bridge Deck Joint Repair Investigation – Phase III

Holding Strategies for Low-Volume State Routes – Phase I

Automating Wrong-Way Driving Detection Using Existing CCTV Cameras

Developing a Research-Grade Iowa Work Zone Database

Holding Strategies for Low-Volume State Routes – Phase II

Disadvantaged Business Enterprises (DBE) Supportive Services

Assessing and Enhancing Transportation Resilience for the State of Iowa

JULY–SEPTEMBER

Feasibility Study of 3D Printing of Concrete for Transportation Infrastructure

Beam End Repair for Prestressed Concrete Beams

Assessing Driver Behavior at Back of Queues: Implications for Queue Warning System in Work Zones

Evaluation, Laboratory Testing, Construction Documentation, and Field Testing/Monitoring of the US 52 Overflow Bridge over the Mississippi River

Development of Adjustment Factors for HCM Sixth Edition Freeway Work Zone Capacity Methodology

APRIL–JUNE

Development of a Life-Cycle Cost Analysis Tool for Improved Maintenance and Management of Bridges

Winter Operations Decision Support Tools for the Iowa DOT Maintenance Bureau

Road Weather Information Systems (RWIS) Life-Cycle Cost Analysis

Field Monitoring of Erosion and Sediment Control Practices and Development of Additional Iowa DOT Design Manual Guidance

Accelerated Repair and Replacement of Expansion Joints

JANUARY–MARCH

Managing Network-Level Scour Risks for Iowa Bridges

Role of Coarse Aggregate Porosity on Chloride Intrusion in HPC Bridge Decks

Evaluate, Modify, and Adapt the ConcreteWorks Software for Iowa's Use

Delivery Methods for Accelerated Bridge Construction Projects: Case Studies and Consensus Building

Bidding of Accelerated Bridge Construction Projects: Case Studies and Consensus Building

In-Service Evaluation of Railroad Signal and Stop Arm Pole Protection

In-Service Evaluation of Culvert Extensions

Design and Performance Verification of a Bridge Column/Footing/Pile System for Accelerated Bridge Construction (ABC)

Optimal RWIS Sensor Density and Location – Phase II

Iowa DOT Office of Maintenance Snowplow Optimization

Long-Term Performance of Overlays: Thin Epoxy Overlay versus Traditional Rigid Overlay

Implementation of Structural Health Monitoring System

Development of a Low-Cost Work Zone Queue Warning System

Development of a Structural Health Monitoring System to Evaluate Structural Capacity and Estimate Remaining Service Life for Bridges

Evaluation of the Performance of A1010 Bridge Steel

Publications continued on page 19

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INTRANS TECHNICAL
REPORTS

29

TECH TRANSFER
SUMMARIES

14

TECH BRIEFS

JOURNAL ARTICLES, GUIDES, AND OTHER TECHNICAL REPORTS

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Compacted subgrade (Photo by Jeff Wykoff, California Nevada Cement Association)

National Concrete Pavement
Technology Center



GUIDE TO CEMENT-STABILIZED SUBGRADE SOILS

A new guide developed by the CP Tech Center in collaboration with the Portland Cement Association (PCA) offers the latest advances in cement-stabilized subgrade (CSS) soil, a compacted, engineered mixture of pulverized in situ soil, water, and moderate proportions of portland cement that results in a semi-bound to bound material.

The *Guide to Cement-Stabilized Subgrade Soils*, completed in May 2020, updates and expands on the information presented in the PCA's 2008 publication *Guide to Cement-Modified Soil (CMS)*. The new guide is available at intrans.iastate.edu/app/uploads/2020/05/guide_to_CSS.pdf.

The guide describes the characteristics, uses, and benefits of cement-stabilized subgrade and presents methods for geotechnical evaluation, mix design, construction, and field testing that will help to produce a satisfactory final project.

While CSS has applications beyond stabilizing problematic soils, the guide focuses on the use of cement to enhance the engineering properties of subgrade soils beneath both rigid and flexible pavements, as well as building floor slabs.

The guide's intended audiences include design engineers, testing laboratory personnel, contractors, and owners. Readers can use the document to determine which applications are appropriate for CSS and the proper steps for its uses in a pavement system project. ■

PRESENTATIONS AND CONFERENCE PROCEEDINGS

- Abukhalil, Y. and Smadi, O. 2020.** Conceptual Transportation Cross Asset Resource Allocation Framework. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Alam-Khan, S., Cetin, B., Jeong, H. D., Ashlock, J. C., and Yaw, M. W. 2020.** A Practical Gravel Loss Prediction Model for Local Agencies, Paper 20-02145. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC, 13 pp.
- Alam-Khan, S., Cetin, B., Jeong, H. D., and Ashlock, J. C. 2020.** A System-Level Gravel Loss Prediction Model. *Proc., ASCE Geo-Congress 2020*, February 25–28, Minneapolis, MN, pp. 192–200.
- Alhasan, A., Smadi, O., and Abukhalil, Y. 2020.** Quantitative Risk Analysis for Pavement Assets: A General Framework. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Alimohammadi, H., Zheng, J., Buss, A., Schaefer, V. R., Williams, R. C., and Zheng, G. 2020.** Performance Evaluation of Hot Mix and Warm Mix Asphalt Overlay Layers based on Field Measurements and Finite Element Viscoelastic Simulations, Paper No. 20-03873. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Alimohammadi, H., Zheng, J., Buss, A., Schaefer, V. R., and Zheng, G. 2020.** Rutting Performance Evaluation of Hot Mix Asphalt and Warm Mix Asphalt Mixtures by Using Dynamic Modulus, Hamburg Wheel Tracking Tests, and Viscoelastic Finite Element Simulations. *Proc., International Conference on Transportation & Development 2020*, August 31, Seattle, WA.
- Al-Shabbani, Z., Sturgill, R. E., and Dadi, G. B. 2020.** Evaluating the Effectiveness of Toolbox Talks on Safety Awareness among Highway Maintenance Crews. *Proc., Construction Research Congress 2020*, March 8–10, Tempe, AZ.
- Ashlock, J. C. 2020.** Mechanistic Performance Evaluation of Chemically and Mechanically Stabilized Granular Roadways. *Poster Presentation at ASCE Geo-Congress 2020*, February 25–28, Minneapolis, MN.
- Barzegar, V. and Laflamme, S. 2020.** Cam-Based Variable Friction Damper for Vibration Mitigation. *Presented at EMI 2020*, May 29–June 1, New York, NY.
- Bou-Saab, G., Venkatachalapathy, A., Hallmark, S., Smadi, O., Xiao, D., and Hutchinson, C. 2020.** Application of a Generic Calibration Guidance to Assess the Precision of Vissim to Generate Real-World Vehicle Activity and Reliable Emissions Estimates. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
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- Buss, A., Xin, K., and Schram, S. 2020.** Validation of Hamburg Performance Testing Correlated to Field Performance Rutting Data Development of a Data-Driven Case for Balanced Mix Design. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Cao, L., Ricles, J., Marullo, T., Downey, A., Stiles, M., Laflamme, S., and Al-Subaihawi, S. 2020.** Characterization of a Novel Semi-Active Friction Device based on Band Brake Technology. *Presented at EMI 2020*, May 29–June 1, New York, NY.
- Ceylan, H. 2020.** Use of LTPP Data to Develop AI-Based Pavement Roughness Prediction Models. *Presented at Workshop of Long-Term LTPP Program at the Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Ceylan, H. 2020.** Use of Unmanned Aerial Systems in Health Monitoring and Management of Transportation Infrastructure Systems. *Presented at Workshop of Developments in Low-Volume Road Management at the Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Ceylan, H. 2020.** Base Stabilization Options. *Presented at 2020 Iowa County Engineers Association Spring Meeting*, March 12–13, Des Moines, IA.
- Ceylan, H. 2020.** New and Innovative Uses of Unmanned Aircraft Systems in Transportation Infrastructure Health Monitoring & Management. *Presented at Iowa LTAP Webinar Series*, May 28, Institute for Transportation, Iowa State University, Ames, IA.
- Ceylan, H. 2020.** Using Otta Seal as a Surface Help Treatment on Low-Volume Roads. *Presented at Transportation Research Board Webinar*, August 4.
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- Ceylan, H. 2020.** Using Otta Seal as a Surface Treatment on Low Volume Roads. *Presented at 2020 Indiana Local Transportation Asset Management Virtual Conference*, October 20–22.
- Ceylan, H. 2020.** Effect and Beneficial Use of Concrete Grinding Residue on Transportation Infrastructure Systems. *Presented at 2020 International Grooving & Grinding Association Annual Meeting*, December 10.
- Cheng, Z., Sritharan, S., and Ashlock, J. 2020.** An Outdoor Test of a Prefabricated Column-Pile Cap-Pile System under Combined Vertical and Lateral Loads. ABC Connections between Substructure Elements: Innovative Details. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Cheng, Z., Sritharan, S., and Ashlock, J. C. 2020.** An Outdoor Test of a Prefabricated Column-Pile Cap-Pile System under Combined Vertical and Lateral Loads, Paper 20-03453. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC, 16 pp.
- Cheng, Z., Sritharan S., and Ashlock, J. 2020.** Behavior of a Bridge Pile Foundation under Combined Vertical and Lateral Loads. *Presented at ACI Spring Convention*, March, Chicago, IL.
- Citir, N., Ceylan, H., and Kim, S. 2020.** Use of LTPP Data to Develop AI-Based Pavement Roughness Prediction Models. *Presented at Workshop of Long-Term LTPP Program at the Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Citir, N., Ceylan, H., and Kim, S. 2020.** Neural Network Models for Flexible Pavement Structural Evaluation. *Proc., Advances in Materials and Pavement Performance Prediction (AM3P) Conference: A Virtual Event*, August 3–7.
- Dang, H. and Shane, J. S. 2020.** A Linear Development Model for Disadvantaged Business Enterprises in Construction Engineering and Management. *Proc., Construction Research Congress 2020*, March 8–10, Tempe, AZ.
- Dang, H. and Shane, J. S. 2020.** Diversity and Inclusion of Business Enterprises: A Comparative Analysis of Programs Used by Disadvantaged Business Enterprises. *Proc., Construction Research Congress 2020*, March 8–10, Tempe, AZ.
- Day, C. M. 2020.** Leveraging Sensor-Based Vehicle Trajectory Construction in Existing Traffic Signal Infrastructure. *Presented at Workshop on Infrastructure Spatial Sensing at Intersections at Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Day, C. M. 2020.** Impact of Sensing Range on the Performance of Real-Time Traffic Signal Control. *Presented at Workshop on Transportation Simulation and CAV Modeling*, Transportation Research Board, Washington, DC.
- Dickey, L. C., McEachran, A. R., Rutherford, C., Perez, M. A., Rehmann, C. R., Isenhardt, T., Jaynes, D., and Groh, T. 2020.** Slope stability analysis of a saturated riparian buffer. *Proc., ASCE Geo-Congress 2020*, February 25–28, Minneapolis, MN.
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- Downey, A., Hu, C., and Laflamme, S. 2020.** Structural Damage Detection using Dense Sensor Network. *Proc., IDET/CIE 2020: Virtual Conference*, August 17–19.
- Gaudefroy, V., Lopresti, D., Porot, L., Pouget, S., Planche, J. P., Williams, R. C., and Chailleux, E. 2020.** Organic compounds evaluation from fumes generated in laboratory by bio-recycled asphalt mixtures. *Proc., RILEM International Symposium on Bituminous Materials (ISBM) 2020*, December 14–16, Lyon, France.
- Genc, D., Ashlock, J. C., Cetin, B., Cetin, K., Mahedi, M., Horton, R., and Ceylan, H. 2020.** Analysis of In-Situ Soil Thermal and Hydraulic Data from a Subgrade Sensor Network Under a Granular Roadway. *Proc., ASCE Geo-Congress 2020*, February 25–28, Minneapolis, MN, pp. 142–151.
- Gopiseti, L. S. P., Ceylan, H., Cetin, B., and Kim, S. 2020.** Analysis of Iowa Pavement Performance Predictions using Satellite-based and Ground-based Climate Data. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Gopiseti, L. S. P., Ceylan, H., Cetin, B., and Kim, S. 2020.** Sensitivity Analysis of New Reflective Cracking Model in Pavement Mechanistic-Empirical Design. *Proc., 2020 ASCE Geo-Congress*, February 25–28, Minneapolis, MN.
- Hallmark, B. and Dong, J. 2020.** Examining the Effects of Winter Road Maintenance Operations on Traffic Safety through Visual Analytics. *Proc., 23rd International IEEE Conference on Intelligent Transportation Systems (ITSC): A Virtual Conference*, September 20–23.
- Hallmark, S., Goswamy, A., Litteral, T., Hawkins, N., Smadi, O., and Knickerbocker, S. 2020.** Evaluation of Sequential Dynamic Chevron Warning Systems on Rural Two-Lane Curves. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Hawkins, N. 2020.** Speed Management Noteworthy Practices. *Presented at Federal Highway Administration and Institute for Transportation Engineers Webinar*, September 3.

Presentations and proceedings continued on page 24

- Jahren, C. 2020.** Award-Winning Seminar Series: It Takes a Village. Presented at Center for Excellence in Learning and Teaching: Online Virtual Seminar Series, Iowa State University, November 4.
- Kamau, J., Podolsky, J., and Williams, R. C. 2020.** Characterizing low temperature mix performance for field-produced mixtures in the state of Iowa. *Proc., Advances in Materials and Pavement Performance Prediction (AM3P) Conference: A Virtual Event*, August 3–7.
- Karaca, I., Ozcan, K., and Sharma, S. 2020.** Distribution Analysis and Multimodality of Highway Speed Measurements. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Knickerbocker, S. 2020.** Lightning Talk on Heavy Truck Crash Tool. Presented at the Transportation Research Board 99th Annual Meeting, January 12–16, Washington, DC.
- Knickerbocker, S. 2020.** Iowa Work Zone Data Hub. Presented at ATSSA 2020 Annual Convention & Traffic Expo, January 24–28, New Orleans, LA.
- Knickerbocker, S. 2020.** Real World AV Data – Collection and Sharing of Work Zone Data. Presented at Work Zone Data Initiative: Boston Peer Exchange on Improving Work Zone Data Automated Vehicle Symposium.
- Knickerbocker, S. 2020.** Using Connected Devices to Improve Work Zone Data for WZDx. Presented at Work Zone Data Initiative: Boston Peer Exchange on Improving Work Zone Data Automated Vehicle Symposium.
- Li, M., Shen, S., Barzegar, V., Sadoughi, M., Laflamme, S., and Hu, C. 2020.** Expected Uncertainty Reduction for Sequential Kriging-Based Reliability Analysis. *Proc., ASME DETC*, Aug 16–19, St. Louis, MO.
- Li, M., Shen, S., Sadoughi, M., Barzegar, V., Laflamme, S., and Hu, C. 2020.** Expected Uncertainty Reduction for Sequential Kriging-Based Reliability Analysis. *Proc., IDETC/CIE 2020: Virtual Conference*, August 17–19.
- Li, Y., Zhang, Y., Ceylan, H., and Kim, S. 2020.** In Situ Evaluation of Using Lignosulfonate for Subgrade Stabilization. *Proc., 2020 ASCE Geo-Congress*, February 25–28, Minneapolis, MN.
- Litteral, T. and Goswamy, A. 2020.** Evaluation of Sequential Dynamic Chevron Warning Systems on Rural Two-Lane Curves. Presented at Transportation Research Board 99th Annual Meeting, January 12–16, Washington, DC.
- Liu, H., Yan, J., Kollosche, M., and Laflamme, S. 2020.** Numerical Investigation of Corrugated Sensing Skin for Structural Health Monitoring. *Proc., QNDE 2020*, August 25–26, Minneapolis, MN.
- Malakooti, A., Theh, W. S., Sadati, S. M. S., Ceylan, H., Kim, S., Mina, M., Cetin, K., and Taylor, P. C. 2020.** Design and Full-Scale Implementation of the Largest Operational Electrically Conductive Concrete Heated Pavement System. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Mantalovas, K., Jiménez Del Barco Carrión, A., Blanc, J., Chailieux, E., Hornych, P., Planche, J. P., Porot, L., Pouget, S., Williams, R. C., and Lo Presti, D. 2020.** Interpreting life cycle assessment results of bio-asphalt pavements for more informed decision-making. *Proc., International Symposium on Pavement, Roadway, and Bridge Life Cycle Assessment 2020*, June 3–6.
- McEachran, A., Dickey, L., Rehmann, C., Rutherford, C., Perez, M., Isenhardt, T., and Groh, T. 2020.** Evaluating and improving current design standards for saturated buffers. Presented at Soil and Water Conservation Society International Annual Conference, July 27–29.
- Micheli, L., Cao, L., and Laflamme, S. 2020.** Surrogate-based Performance Evaluation Strategy for High Performance Control Systems under Uncertainties. *Proc., Smart Structures and NDE 2020 Digital Forum*, April 27–May 1.
- Nlenanya, I. and Smadi, O. 2020.** Database Design and Integration Framework for Risk Management for State Highway Agencies. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Oakleaf, T., Farina, C., Kluck, M., Pico, A., and Shane, J. S. 2020.** Facility Standardization for Program Success. Presented at Construction Industry Institute Annual Conference, October.
- Oneyear, N. 2020.** Rural Road Design and Maintenance Session. Presented at 3rd National Summit on Rural Road Safety, September 30.
- Oneyear, N. 2020.** Take Action Now – Road Safety Champions Training. Presented at 3rd National Summit on Rural Road Safety, September 30.
- Pinto, I. and Buss, A. 2020.** The Effect of Zeta Potential on the Cohesive Strength of Slurry Seals. Presented at 57th Petersen Asphalt Research Conference, July 13–14, Laramie, WY.
- Poddar, S., Wang, S., Chakraborty, P., Sharma, A., and Knickerbocker, K. 2020.** Deep Learning Enabled Long-Term Traffic Speed Prediction Using Historical Traffic Speed and Predicted Weather. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Podolsky, J., Hohmann, A., Chen, C., Sotoodeh-Nia, Z., Manke, N., Saw, B., Hernandez, N., Ledtje, P., Forrester, M., Williams, R. C., Cochran, E., and Huisman, T. 2020.** Effect of soybean oil derived additives on improved performance of polymer-modified asphalt binder and mix containing 50% fine-graded RAP. *Proc., RILEM International Symposium on Bituminous Materials (ISBM) 2020*, December 14–16, Lyon, France.
- Resende, C. B., Volk, M. J., and Shane, J. S. 2020.** Post-Project Evaluation and Lessons Learned. *Proc., Construction Research Congress 2020*, March 8–10, Tempe, AZ.
- Riera, L., Ozcan, K., Merickel, J., Rizzo, M., Sarkar, S., and Sharma, A. 2020.** Detecting and Tracking Unsafe Lane Departure Events for Predicting Driver Safety in Challenging Naturalistic Driving Data. *Proc., 2020 IEEE Intelligent Vehicles Symposium*, October 20–23, Las Vegas, NV.
- Sadati, S. S. M., Malakooti, A., Cetin, K., Ceylan, H., and Kim, S. 2020.** Proposing Improvements on the Construction of Electrically Conductive Concrete Pavement System based on Lessons Learned. *Proc., 2020 Construction Research Congress*, March 8–10, Arizona State University, Tempe, AZ.
- Sadati, S., Taylor, P., Kevern, J., Wang, X., and Wang, K. 2020.** Air Void System Requirements for a Durable Paving Concrete. Presented at 12th International Conference on Concrete Pavements, August 30–September 3, Minneapolis, MN.
- Satvati, S., Cetin, B., and Ashlock, J. C. 2020.** Evaluation of Cost-Effective Aggregate Options for Granular Roadways, Paper 20-04811. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC, 16 pp.
- Satvati, S., Cetin, B., Ashlock, J. C., and Li, C. 2020.** Investigation of the Performance of Different Surface Aggregate Materials for Granular Roads. *Proc., ASCE Geo-Congress 2020*, February 25–28, Minneapolis, MN, pp. 498–507.
- Satvati, S., Cetin, B., Ashlock, J. C., Ceylan, H., and Rutherford, C. 2020.** Binding Capacity of Quarry Fines for Granular Aggregates. *Proc., ASCE Geo-Congress 2020*, February 25–28, Minneapolis, MN, pp. 457–466.
- Schaefer, V. R. 2020.** GeoTechTools and Ground Improvement: Recent Updates. Presented at Arizona Geo-Institute Southwest Symposium, September 22.
- Schaefer, V. R. 2020.** Keynote Speaker: Pavement Support Stabilization. Presented at Tensar Virtual Road Show, November 19.
- Shane, J. S., Bogus, S., Gambatese, J., Rowings, J., and Ruyle, C. 2020.** The Importance of Construction Engineering Program Commentary. Presented at ASCE Construction Institute Summit, February 22, Los Angeles, CA.
- Shane, J. S., Becker, T., Roberts, C., and Kiggins, M. 2020.** Owner and Contractor Choices and Dilemmas: Contemporary Project Delivery Options. *Proc., Construction Research Congress 2020*, March 8–10, Tempe, AZ.
- Shrestha, B. K., Choi, J. O., Kwak, Y. H., and Shane, J. S. 2020.** Timings of Accomplishments for Facility Design Standardization Critical Success Factors in Capital Projects. *Proc., Construction Research Congress 2020*, March 8–10, Tempe, AZ.
- Staver, M., Podolsky, J., Huisman, T., Williams, R. C., Pinto, I., and Buss, A. 2020.** Field Study Evaluation of Soybean Oil Derived Additives Used in a Bio-Cutback and Bio-Fog Seal for Brittle HMA. Presented at 57th Petersen Asphalt Research Conference, July 13–14, Laramie, WY.
- Staver, M., Podolsky, J., Williams, R. C., and Huisman, T. 2020.** Performance Evaluation of Soybean Oil Derived Additives used in Penetrating Bio-cutback Application for Brittle HMA. *Proc., 2020 Canadian Technical Asphalt Association Conference Online Meeting*, November 16–19.
- Sturgill, R. E. 2020.** E-Ticketing and Digital As-Built Innovation. Presented at Federal Highway Administration Everyday Counts-6 Virtual Summit, December 8–10.
- Tan, N., Freeseaman, K., and Wang, K. 2020.** Bond Strength and Chloride Resistance of Epoxy and Concrete Overlays, Poster 20-00449. *Poster presented at Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.
- Thompson, K. R., Mahmud, S., Niloy, M. T. A., and Day, C. M. 2020.** Probe Vehicle Performance Measures for Assessing Travel Time Reliability. *Proc., Transportation Research Board 99th Annual Meeting*, January 12–16, Washington, DC.

Wi, K. and Wang, K. 2020. Evaluation of Quality of 3D Printing Concrete. *Presented at ACI Convention Technical Session of Research in Progress*, October 26.

Wood, J. S. 2020. A Safety Analytics and Engineering Data Science Experience at Ford Motor Company. *Presented at Pennsylvania State University, Online Presentation to Graduate Students and Faculty in the Civil and Environmental Engineering Department*, November 19.

Wood, J. S. 2020. CAV Panel Discussion. *Presented at Missouri Blueprint Conference*, September 30.

Wu, Y., Ashlock, J. C., Cetin, B., Satvati, S., Li, C., and Ceylan, H. 2020. Mechanistic Performance Evaluation of Chemically and Mechanically Stabilized Granular Roadways. *Proc., ASCE Geo-Congress 2020*, February 25–28, Minneapolis, MN, pp. 591–601.

Xing, W., Guo, F., Jahren, C., Zhang, C., and Hao, J. 2020. Case Studies of Using BIM for Infrastructure in Utility Tunnel Projects in Jiangsu China. *Proc., 2020 Construction Research Congress*, March 8–10, Arizona State University, Tempe, AZ.

Yan, J. and Laflamme, S. 2020. Real-Time System Identification for High-Rate Systems. *Presented at EMI 2020*, May 29–June 1, New York, NY.

Yan, J., Laflamme, S., and Dodson, J. 2020. Physics-Informed Real-Time Adaptive Model for High-Rate Dynamic System Identification. *Proc., QNDE 2020*, August 25–26, Minneapolis, MN.

Yang, B., Zhang, Y., Luo, C., Cetin, B., Ceylan, H., Kim, S., and Horton, R. 2020. Effect of Concrete Grinding Residue on Minnesota Roadside Soil Properties. *Proc., 2020 ASCE Geo-Congress*, February 25–28, Minneapolis, MN.

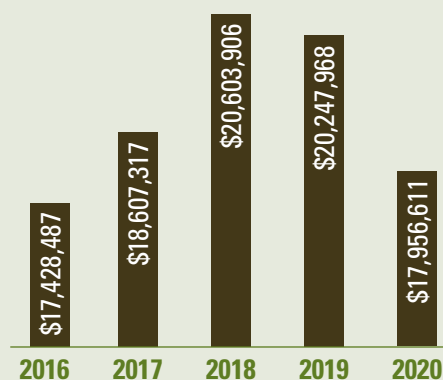
Yang, J. and Dong, J. 2020. Assess the Performance of Electric Autonomous Taxi System Using A Data-driven Simulation Model. *Proc., 3rd International Forum on Connected Automated Vehicle Highway System through the China Highway & Transportation Society*, December 30. ■

INTRANS BY THE NUMBERS

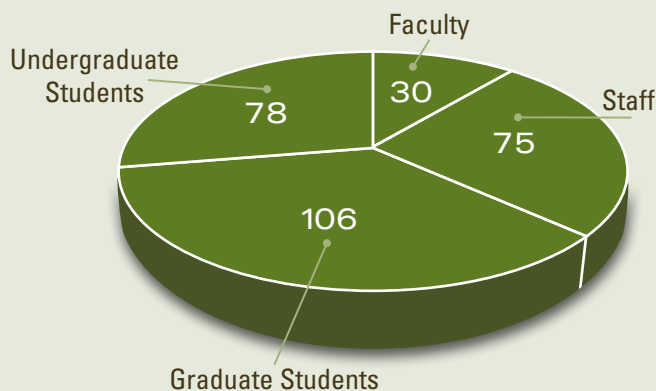
Reports below reflect figures and activities from the fiscal reporting period of July 2019–June 2020

| FUNDING SOURCES | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|------|------|------|------|------|
| Iowa DOT | 41% | 41% | 44% | 50% | 53% |
| Other Iowa Govt. Agencies | 1% | 1% | 1% | 1% | 1% |
| Other State Agencies | 4% | 2% | 2% | 9% | 8% |
| Other (conferences, fees, misc. services, etc.) | 13% | 12% | 15% | 14% | 16% |
| Industry | 4% | 5% | 7% | 9% | 7% |
| Federal Agencies | 37% | 39% | 31% | 17% | 15% |

TOTAL FUNDING FROM ALL SOURCES

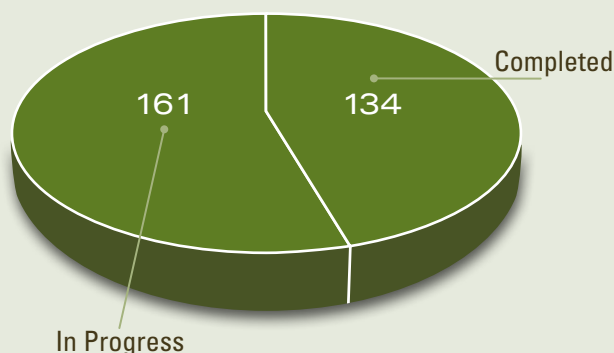


FY 2020 EMPLOYEE STATISTICS



TOTAL EMPLOYEES: 289

FY 2020 INTRANS PROJECTS



TOTAL PROJECTS: 295

AWARDS AND HONORS

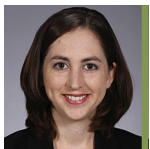
FACULTY AWARDS

InTrans director receives Faculty Mentor Award



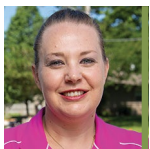
InTrans Director Shauna Hallmark is among the 2020 recipients of the Exemplary Faculty Mentor Award, which recognizes Iowa State University faculty mentors who go above and beyond the formal expectations of the university's mentoring program. Winners are nominated by their mentees for the positive impact they have made in their lives and careers. Hallmark, who is also a professor in the Department of Civil, Construction, and Environmental Engineering (CCEE), is one of 21 faculty members to receive the award in 2020.

AMPP's Buss receives faculty fellowship



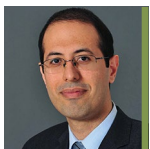
Ashley Buss, faculty affiliate with the AMPP, received the Black and Veatch "Building a World of Difference" Faculty Fellowship, which focuses on how to attain sustainable infrastructure for the long term and the role education plays in supporting new innovations. Buss hopes through the fellowship to be able to increase research and testing on asphalt emulsions, including through running microscopy tests.

CMAT's Shane named W. A. Klinger Teaching Professor for Construction Engineering



CMAT Program Director Jennifer Shane received the W. A. Klinger Teaching Professorship for Construction Engineering. The appointment recognizes Shane's teaching and research leadership in the construction engineering program at Iowa State University. The W.A. Klinger Teaching Professorship is named for the founder of W.A. Klinger LLC, an Iowa-based construction company. In the 1950s, Klinger was deeply involved in helping to create Iowa State University's construction engineering curriculum.

Shafei receives awards for CCEE work



BEC Structural Engineer Behrouz Shafei received the Postdoctoral Mentoring Award and the Charles W. Schafer Award for Excellence in Teaching, Research, and Service. The Postdoctoral Mentoring Award recognizes principal investigators' (PIs') excellence in their mentorship of postdoctoral scholars and is meant to promote a collaborative research environment for postdoctoral scholars. The Charles W. Schafer Award for Excellence in Teaching, Research, and Service is a Department of CCEE award that promotes excellence in teaching, research, and service by junior faculty members.

Dong recognized by Iowa State's Student Government for use of open educational resources



Jing Dong, InTrans transportation engineer and associate professor in Iowa State University's CCEE department, earned an Award of Excellence from the Student Government for her use of open educational resources—free and openly licensed course materials—in the classroom to provide more equitable and affordable education for students. The 2020 awards were part of a pilot for students to provide a "thank you" to professors, and they recognized all faculty using open educational resources, rather than commercial textbooks, for the time and effort it takes for instructors to locate and integrate open content for the benefit of their students.

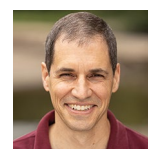
Kim recognized for PEGASAS work



Sunghwan Kim, associate director of PROSPER, received the Federal Aviation Administration (FAA)

Partnership to Enhance General Aviation Safety, Accessibility, and Sustainability (PEGASAS) Jimenez Faculty Researcher Award. The award recognizes individuals who lead PEGASAS projects in a PI or co-PI role. Kim was presented with the award during the PEGASAS Annual Meeting that was held virtually in 2020. The award was presented to PROSPER Director Halil Ceylan in 2019. Ceylan and Kim's team has been developing and implementing cost-effective, best-performance electrically conductive concrete (ECON) by adding conductive materials to normal concrete through an FAA PEGASAS-sponsored research grant.

Rehmann receives two faculty awards



Chris Rehmann, InTrans faculty affiliate, earned two awards in 2020 for his faculty work as an associate professor in

Iowa State University's CCEE department. The Iowa Board of Regents presented Rehmann with the Regents Award for Faculty Excellence, and Iowa State University awarded him an Exemplary Faculty Mentor Award. The Regents award recognizes tenured faculty members who are outstanding university citizens and have rendered significant service to the university or to Iowa. The Exemplary Faculty Mentor Award recognizes faculty mentors who go above and beyond the formal expectations of Iowa State University's mentoring program, and the winners are nominated by their mentees for the positive impact they have made in their lives and careers.

Awards continued on page 27

Top, center, and bottom photos above by Christopher Gannon

STUDENT AWARDS

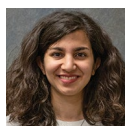
InTrans doctoral candidate earns Fulbright Award



InTrans doctoral candidate and graduate research assistant Brianna Lawton was selected for a

Fulbright U.S. Student award for the 2020–2021 academic year. She will conduct transportation research in Ghana as part of the award. Lawton, who studies under InTrans Director Shauna Hallmark, said she believes the research she will conduct as part of the award can be a foundation to establish a framework of how transportation engineers worldwide can approach road safety studies dynamically. She hopes that framework of safety protocols can ultimately contribute to decreasing crash fatalities—saving lives and money.

InTrans alumni snag Women in Transportation Awards



InTrans alumna Bahar Bazargani and Wasama

Abdullah both received the Helene M. Overly Graduate Scholarship from WTS International, an organization dedicated to supporting women in the transportation industry. Bazargani's award is from the Kansas City chapter, and Abdullah's is from the Greater Chicago chapter. (Since Iowa's chapter has only recently started, it was not accepting award applicants during the period in which Bazargani and Abdullah applied.) Both women worked with CTRE Director Omar Smadi and researched highway safety and intelligent infrastructure engineering. Both won their awards as graduate students but have since graduated. Iowa State University women have won a scholarship from the WTS Greater Chicago Area Chapter in each of the last five years.

Student paper on ATSPMs earns accolades



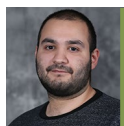
InTrans graduate student A.M. Tahsin Emtenan has received multiple accolades for a paper he wrote on detector configurations for automated traffic signal performance measures (ATSPMs). The paper most recently was selected for the Student Paper Award for the Institute of Transportation Engineers (ITE) Midwestern District and previously won the Thomas J. Seburn Student Paper Award from the Missouri Valley Section of ITE (MOVITE). Emtenan's paper, titled "Impacts of Detector Configuration on Performance Measurement and Signal Operations," was coauthored with InTrans affiliate researcher Chris Day, whom Emtenan is studying under as part of his graduate work.

InTrans doctoral candidate voted to lead among IRF Fellows



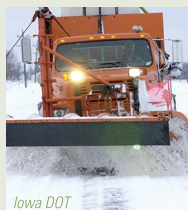
InTrans doctoral candidate Ahmed AlBughdadi was among 14 fellows of the 2020 International Road Federation (IRF) Road Scholar Program and was selected as their class president at the end of the program. AlBughdadi also received the Jerry Shea Leadership Award, which recognizes outstanding leadership skills and ability to work with a team, as part of the program. He is the first student from Iowa State University to win the award. The IRF Road Scholar Program is a leadership and orientation program that runs concurrently with the Transportation Research Board (TRB) Annual Meeting. AlBughdadi is studying transportation asset management under CTRE Director Omar Smadi.

InTrans graduate receives environmental award



InTrans graduate Georges Bou-Saab recently earned a Young Professional Best Paper Award for work completed as part of his doctoral degree from Iowa State University. Bou-Saab, now a transportation engineer for the global design and consultancy firm Arcadis Inc. in Columbus, Ohio, earned top prize in the environmental management category from the Air & Waste Management Association (AWMA) for his paper titled "Generic Calibration Guidance to Assess the Precision of Vissim to Generate Real-World Vehicle Activity for Reliable Emissions Estimates." The paper was coauthored by current InTrans graduate student Archana Venkatachalapathy, InTrans Director Shauna Hallmark, and CTRE Director Omar Smadi. ■

InTrans project featured as AASHTO High-Value Research



An InTrans research project on snowplow route optimization earned recognition as a 2020 high-value research project by the American Association of State Highway and Transportation Officials (AASHTO) Research Advisory Committee (RAC). The project, "Iowa DOT Office of Maintenance Snowplow Optimization," led by InTrans transportation engineer and Iowa State University Associate Professor Jing Dong, was recognized in the area of maintenance, management, and preservation. Each year, state departments of transportation submit research projects to the AASHTO RAC that are innovative, impact their agencies' practices and policies, and benefit the traveling public. ■

COMMITTEE INVOLVEMENT AND SERVICE TO THE PROFESSION

John Adam, Program Manager, CP Tech Center

- Friend, Transportation Research Board (TRB) Concrete Pavement Construction and Rehabilitation Committee (AKC50)
- Friend, TRB Pavement Preservation Committee (AKT20)
- Team Member & Subject Matter Expert (SME), Federal Highway Administration (FHWA) Every Day Counts Sixth Round (EDC-6) Innovation Targeted Overlay Pavement Solutions Implementation
- Participant & SME, FHWA Resilience Peer Exchange
- Member, American Concrete Paving Association (ACPA) Quality Construction Committee
- Presenter, South Dakota Concrete Conference (on Pavement Distress & Repair Methods and Performance Engineered Mixtures [PEM])
- Presenter, Iowa Concrete Pavement Association Lunch & Learn (Council Bluffs, Sioux City)

Paul Albritton, Technical Training Coordinator, LTAP

- Authorized Instructor, Occupational Safety and Health Administration (OSHA) Outreach
- Instructor, Iowa Department of Transportation (DOT) Work Zone Safety Workshops
- Advisor, *Temporary Traffic Control Handbook for Iowa* Revision Committee
- LTAP Representative, Iowa Chapter of American Public Works Association (APWA) Spring, Fall, and National conferences; Iowa Streets and Roads Workshop & Conference; and Iowa County Engineers Association Annual Conference

Jeremy Ashlock, Faculty Affiliate

- Chair, American Society for Testing and Materials (ASTM) International: Subcommittee D18.09 on Cyclic and Dynamic Properties of Soils
- Task Group Member, ASTM Subcommittee D18.09, Task Group for revision of Standards D3999 and D5311
- Task Group Lead, ASTM Subcommittee D18.02 on Sampling and Related Field Testing for Soil Evaluations, Task Group on development of new standard on borehole shear test
- Reviewer, *Soil Dynamics and Earthquake Engineering*
- Reviewer, *ASTM Geotechnical Testing Journal*
- Reviewer, *ASTM Journal of Testing and Evaluation*
- Reviewer, *Transportation Research Record*
- Reviewer, *ASCE Journal of Geotechnical and Geoenvironmental Engineering*
- Reviewer, *ASCE Journal of Engineering Mechanics*
- Reviewer, *Geotechnique*
- Reviewer, *Journal of Applied Geophysics*
- Reviewer, American Society of Civil Engineers (ASCE) 2020 Geo-Congress Conference
- Reviewer, 19th International Conference on Soil Mechanics and Geotechnical Engineering (ICSMGE) Seoul Conference

Guillermo Basulto-Elias, Assistant Scientist, CTRE

- President, American Statistical Association, Iowa Chapter

Ashley Buss, Faculty Affiliate

- Member, TRB Non-Binder Components of Asphalt Mixtures Committee (AKM30 [Formerly AFK30]), and participating in Cold-in-Place Recycling Subcommittee
- Member, TRB Quality Assurance Management Committee (AKC30 [Formerly AFH20]), and author on Centennial Paper
- Member, TRB Design and Rehabilitation of Asphalt Pavements Committee (AFD60), and participating in task force on composite pavements
- Participant, Attended Asphalt Paving Association of Iowa (APAI) Paving Open House Summer 2020

- Presenter, Iowa LTAP Webinar: Effectiveness of Pavement Preservation
- Member, International Slurry Surfacing Association Workforce Development Task Group
- Faculty Advisor, Iranian Students' and Scholars' Association

Halil Ceylan, Director, PROSPER

- Chair, ASCE Geo-Institute (G-I) Pavements Committee
- Chair, ASCE Transportation and Development Institute (T&DI) Unmanned Aircraft Systems (UAS) Impacts Task Force Committee
- Member, ASCE T&DI Highway Pavement Committee
- Member, ASCE T&DI Emerging Technologies Council
- Member, ASCE T&DI Subcommittee on Long-Term Pavement Performance (LTPP) Data Analysis
- Member, TRB Backcalculation of Pavement Layer Moduli Subcommittee (AFD80(1))
- Member, TRB Interlayer Systems to Control Reflective Cracking Subcommittee (AFD70(1))
- Member, TRB Advanced Concrete Pavement Modeling Subcommittee (AFD50(1))
- Friend, TRB Pavement Monitoring and Evaluation Committee (AFD20)
- Friend, TRB Pavement Rehabilitation Committee (AFD70)
- Friend, TRB Mineral Aggregates Committee (A2J03)
- Member, United States University Council for Geotechnical Education and Research
- Member, International Society for Maintenance and Rehabilitation of Transportation Infrastructures
- Member, Falling Weight Deflectometer Users Group
- Member, International Society for Concrete Pavements
- Member, Turkish-American Scientists and Scholars Association
- Member, Turkish Chamber of Civil Engineers
- ISU Site Director, FAA sponsored Center of Excellence for Partnership to Enhance General Aviation Safety, Accessibility, and Sustainability (PEGASAS)
- Associate Editor, *ASCE Journal of Transportation Engineering Part B: Pavements*
- Topic Editor-in-Chief, *World Journal of Engineering and Technology*
- Editorial Board Member/Editor/Assessor, *Proceedings of the Institution of Civil Engineers (ICE) – Construction Materials*
- Editorial Board Member/Editor/Assessor, *ICE Infrastructure Asset Management*
- Editorial Board Member/Editor, *Journal of Data Analysis and Information Processing*
- Editorial Board Member/Editor, *International Journal of Mechanics and Solids*
- Editorial Board Member/Editor, *Baltic Journal of Road and Bridge Engineering*
- Associate Editor, *International Journal of Pavement Research and Technology*
- Guest Editor, Special Issue: "Latest Scientific Development on Civil Engineering and Architecture," *The Scientific World Journal*

Justin Dahlberg, Acting Director, NCWTS

- Participant, Association for Preservation Technology's International Student Design-Build Competition (presenting previous research on covered timber bridges)

Christopher Day, Affiliate Researcher

- Member, ASCE
- Member, Institute of Transportation Engineers (ITE)
- Member, Institute of Electrical and Electronics Engineers (IEEE)
- Associate Editor and Reviewer, *ASCE Journal of Transportation Engineering, Part A: Systems*

- Associate Editor, *Journal of Modern Mobility Systems*
- Handling Editor, *Transportation Research Record*
- Member and Research Coordinator, TRB Traffic Signal Systems Committee (AHB25)
- Reviewer, *Transportation Research Record*
- Reviewer, *Transportation Research Part B*
- Reviewer, *Transportation Research Part C*
- Reviewer, Transportation Research Board Annual Meeting
- Reviewer, *ASCE Journal of Infrastructure Systems*
- Reviewer, *ASCE Journal of Pipeline Systems Engineering and Practice*
- Reviewer, *ASCE Journal of Transportation Engineering*
- Reviewer, *IEEE Transactions on Intelligent Transportation System*
- Reviewer, *IEEE Intelligent Transportation Systems Magazine*
- Reviewer, *IEEE Internet of Things Journal*
- Reviewer, *Journal of Big Data Analytics in Transportation*
- Reviewer, *Journal of Advanced Transportation*
- Reviewer, *ITE Journal*
- Reviewer, *Case Studies on Transport Policy*
- Reviewer, *Institute of Engineering and Technology (IET) Intelligent Transportation Systems*
- Reviewer, *Simulation: Transactions of the Society for Modeling and Simulation*
- Reviewer, *Computer Standards and Interfaces*

Jing Dong, Transportation Engineer, CTRE

- Senior Member, IEEE
- Member, TRB Transportation Network Modeling Committee (ADB30)
- Member, TRB Traffic Flow Theory and Characteristics Committee (AHB45)
- Editor, *Journal of Advanced Transportation*
- Associate Editor, IEEE Conference on Intelligent Transportation Systems

Shauna Hallmark, Director, InTrans

- Member, TRB Ahead of the Curve Subcommittee (ABG10(1))
- Member, TRB Traffic Control Devices Committee (ACP55)
- Member, TRB Performance Effects of Geometric Design Committee (AKD10)
- Member, NCHRP 17-72 Panel
- Board of Directors, Air and Waste Management Association
- Executive Committee, Council of University Transportation Centers

Zachary Hans, Director, CWIMS

- Member, TRB Geographic Information Science Committee (AED40)
- Member, Iowa Statewide Traffic Records Coordinating Committee (STRCC)
- Member, Iowa Motor Carrier Safety Assistance Program (MCSAP) Working Group Committee
- Invited Presentation, American Association of Motor Vehicle Administrators (AAMVA) Fraud Awareness Call

Neal Hawkins, Associate Director, InTrans

- Member, TRB Traffic Control Devices Committee (ACP55)
- Member, TRB Sign and Marking Materials Committee (AHD55)
- Friend, American Traffic Safety Services Association (ATSSA) Pavement Marking Committee
- Panelist, Iowa DOT Chief Operating Officer selection committee
- Presenter, Noteworthy Speed Management Practices webinar for FHWA

Committee involvement continued on page 29

Charles Jahren, Faculty Affiliate

- Editorial Board Chair (emeritus editor-in-chief), *ASCE Journal of Construction Engineering and Management*
- Member, ASCE Construction Education Committee
- Member, ASCE Construction Research Council
- Member, ASCE Digital Project Delivery Committee
- Member, National Council of Examiners for Engineering and Surveying (NCEES) Civil Engineering Professional Engineer Test Writing Committee
- Member, Global Leadership Forum for Construction Engineering and Management Programs
- Member, National Academy of Construction

Sunghwan Kim, Associate Director, PROSPER

- Member, ASCE
- Member, ASCE G-I
- Member, ASCE T&DI
- Member, ASCE Iowa Section
- Member, American Association for the Advancement of Science (AAAS)
- Recollections and assistance in assembling the Centennial Paper "Design and Rehabilitation of Asphalt Pavements: History and Future" developed by TRB committee Design and Rehabilitation of Asphalt Pavements as part of the celebration of the 100th year anniversary of TRB

Keith Knapp, Director, LTAP

- Member, TRB Safety Performance and Analysis Committee (ACS20)
- President, National Local and Tribal Technical Assistance Program Association (NLTAPA)

Skylar Knickerbocker, Codirector, REACTOR

- Co-Chair, WZDx Specification Update Subgroup
- Member, TRB Traffic Control Devices Committee (ACP55)
- Member, TRB Visualization in Transportation Committee (AED80)
- Invited Presentation, Work Zone Data Initiative Peer Exchange in Boston
- Invited Presentation, Commercial Vehicle Safety Center webinar on Heavy Truck Crash Tool

Simon Laflamme, Faculty Affiliate

- Editorial Board Member, *Measurement Science and Technology*
- Editorial Board Member, *Sensors*
- Invited Contribution, Materials Evaluation, American Society for Nondestructive Testing (ASNT)
- Led two special issues (one in Sensors, one in MST)
- Actively contribute to International Society for Optics and Photonics (SPIE) and Quantitative Nondestructive Evaluation (QNDE) conferences, and organized a special full session on structural health monitoring (SHM) at QNDE 2020

Theresa Litteral, Statewide MDST Facilitator, LTAP

- Member, Statewide Traffic Incident Management (TIM) Committee
- Member, Iowa Fatality Reduction Task Force
- Member, Iowa Advisory Council on Automated Transportation
- Member, Iowa STRCC

Katherine Madson, Faculty Affiliate, CMAT

- Friend, TRB Construction Management Committee (AFH10)
- Friend, TRB Data for Decision Making Committee (AJE70)
- Friend, TRB Freight Transportation Data Committee (AED70)
- Friend, TRB Disaster Response, Emergency, Evacuations, and Business Continuity Committee (AMR20)

- Friend, TRB Transportation Asset Management Committee (ABC40)
- Reviewer, *Journal of Engineering, Construction, and Architectural Management*
- Reviewer, *Engineering Project Organization Journal*
- Reviewer, *Journal of Cleaner Production*
- Reviewer, ASCE Construction Research Congress Conference
- Track Co-Chair, Project and Organizational Management and Planning Track for ASCE Construction Research Congress 2022

Hossein Naraghi, Research Engineer, CTRE

- Friend, TRB Safety Data, Analysis and Evaluation Committee (ANB20)
- Friend, TRB Traffic Law Enforcement Committee (ANB40)
- Friend, TRB Safety Data Subcommittee (ABJ20)

Inya Nlenanya, Transportation Research Specialist/GIS Specialist, CTRE

- Member, TRB Low Volume Road Committee (AKD30)
- Alpha Epsilon, The Honor Society of Agricultural, Food, and Biological Engineering
- Associate Member, ASCE

Nicole Oneyear, Associate Scientist, CTRE

- Young Member, TRB Traffic Law Enforcement Committee (ANB40)
- Student Chapter Liaison, Missouri Valley Institute for Transportation Engineers (MOVITE)
- Member, Iowa Women's Transportation Seminar (WTS) Chapter Sponsorship Committee
- Reviewer, *Journal of Safety Research*
- Presenter, Iowa LTAP Webinar: Maintenance and Safety – Signs and Sign Supports
- Presenter, Iowa LTAP Webinar: Improving Safety through Vegetation Control and Maintenance of Drainage Features
- Speaker, 3rd National Rural Road Safety Summit panel
- Helped promote the first Rural Road Safety Awareness Week with the National Center for Rural Road Safety

Brent Phares, Bridge Research Engineer, BEC

- Member, TRB Testing and Evaluation of Transportation Structures Committee (AKB40)
- Member, TRB Construction of Bridges and Structures Committee (AKC40)
- Provided nationwide training to K–12 educators on the integration of a specially created Engineering module into their classrooms

Chris Rehmann, Faculty Affiliate

- Member, Hydraulic Measurements and Experimental Methods Committee of the ASCE Environmental & Water Resources Institute
- Reviewer, *Environmental Monitoring and Assessment*
- Reviewer, *Journal of the American Water Resources Association*

Beth Richards, Program Coordinator, SUDAS

- Secretary/Treasurer, APWA, Iowa Chapter

Vern Schaefer, Interim Director, CEER

- Member, Board of Directors of the Association of Geohazard Professionals
- Member, International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) Ground Improvement Technical Committee (TC 211)
- Chair, U.S. National Society of the International Society for Soil Mechanics and Geotechnical Engineering effort to review US papers for the ICSMGE
- Member, Science Advisory Board of the Center for Bio-Mediated and Bio-Inspired Geotechnics

- Member, Deep Foundations Institute (DFI) Deep Foundations for Landslides/Slope Stabilization Committee
- Member, DFI Ground Improvement Committee
- Member, DFI Women in Deep Foundations Committee
- Member, ASCE G-I Embankments, Dams, and Slopes Committee
- Member, ASCE G-I Soil Improvement Committee
- Member, ASCE Foundation Design Standard Committee
- Elected member, 2020 Class of the Civil and Environmental Engineering Academy of Distinguished Alumni, Civil & Environmental Engineering Department, Virginia Polytechnic Institute and State University
- Participant in discussions on the development of the Peterson Endowment for Geo-Construction Innovation

Jennifer Shane, Director, CMAT

- Communication Coordinator, TRB Construction Management Committee (AFH10)
- Research Coordinator, TRB Contracting Equity Committee (AJE60)
- Chair, ASCE Management Practices in Construction Committee
- Member, ASCE Construction Research Council
- Member, ASCE Henry L. Michel Award Committee
- Editorial Board Member, *ASCE Journal of Management in Engineering*
- Co-editor, *ASCE Journal of Management in Engineering* Special Collection on Diversity
- Editorial Board Member, *ASCE Practice Periodical on Structural Design and Construction*

Anuj Sharma, Codirector, REACTOR

- Member, TRB Traffic Signal Systems Committee (ACP25)
- Co-Chair, Conference on Computer Vision and Pattern Recognition (CVPR) AI City Challenge
- Co-Editor-in-Chief, *Journal of Big Data Analytics in Transportation*
- Associate Editor, IEEE 2020 Forum on Integrated and Sustainable Transportation System
- Reviewer, *Analytic Methods in Accident Research*
- Reviewer, *Accident Analysis & Prevention*
- Reviewer, *Computer-Aided Civil and Infrastructure Engineering*
- Reviewer, *Transportation Research Part F: Traffic Psychology and Behaviour*
- Reviewer, *Journal of Transportation Safety and Security*
- Reviewer, *Transportation in Developing Economies*
- Reviewer, *Transportation Research Record*
- Reviewer, *ASCE Journal of Transportation Engineering*
- Reviewer, *Journal of Intelligent Transportation Systems*
- Reviewer, *Traffic Injury Prevention*

John Shaw, Researcher, CTRE

- Member, TRB Traffic Simulation Committee (ACP80)
- Co-Chair, TRB Joint Simulation Subcommittee (SimSub) (ACP80(1))
- Member, TRB Rural Transportation Issues Coordinating Council (A0040C)
- Member, BTSCR Project Panel on Ensuring Child Safety in New Travel Modes

Omar Smadi, Director, CTRE

- Member, International Road Federation (IRF) Executive Board
- Member, IRF Asset Management Committee
- Member, World Road Association (PIARC) Infrastructure Committee

- Member, TRB Transportation Asset Management Committee (ABC40)
- Associate Member, ASCE Infrastructure Management Committee
- Associate Member, ASCE Pavements Committee
- Chair, Organizing Committee of the 2020 International Conference on Managing Pavement Assets (postponed to 2022 due to COVID-19)
- Member, Scientific Committee of the 18th World Meeting & Exhibition of the IRF

Gordon Smith, Associate Director, CP Tech Center

- Member, TRB Concrete Pavement Construction and Rehabilitation Committee (AKC50)
- Friend, TRB Design and Rehabilitation of Concrete Pavements Committee (AKP20)
- Friend, TRB Durability of Concrete Committee (AKM70)
- Member/Past Officer, American Concrete Institute (ACI) Iowa Chapter
- Member/ Task Force Leader, ACPA Research, Technology, & Innovation (RT&I) Committee
- Presenter, Integrated Materials and Construction Practices (IMCP) Workshop to Massachusetts DOT and industry
- Presenter, Concrete Paving Workshop by the ACPA–Utah Chapter (on PEM)
- Presenter, Concrete Overlay Workshop to Montana DOT and industry
- Presenter, Virginia Concrete Conference (on PEM)
- Presenter, Iowa Ready Mixed Concrete Association (on PEM)
- Presenter, IMCP Workshop, twice, to Indiana DOT and industry
- Presenter, CONEXPO-CON/AGG 2020 (on PEM)
- Presenter, CP Tech/ACPA Webinar (on concrete overlays)
- Presenter, Florida PaveWise Conference (on CP Tech and activities)
- Presenter, TRB webinar (on concrete overlays)

Sri Sritharan, Faculty Affiliate

- Vice Chair, American Wind Energy Association Research & Development (R&D) Committee
- Member, TRB Seismic Design and Performance of Bridges Committee (AFF50)
- Member, ACI Earthquake-Resistant Concrete Bridges Committee (ACI 341)
- Member, ACI Finite Element Analysis of Reinforced Concrete Structures Committee (ACI 447)
- Attracted \$300,000 investment toward the Program for Women in Science and Engineering (WiSE) from a non-ISU donor

Roy Sturgill, Construction Engineer, CMAT

- Chair, TRB Utility Coordination Committee (AKD60)
- Member, TRB Committee on Construction Management (AKC10)
- Member, ASCE Utility Engineering & Surveying Institute Utility Coordination Committee
- Member, ASCE Utility Engineering & Surveying Institute Utility Risk Research and Education Council
- Member, American Association of State Highway and Transportation Officials (AASHTO) Committee on Construction—Subcommittee on Integrated Construction Technologies; Subcommittee on Safety, Environment, and Workforce Development; Subcommittee on Research
- Member, AASHTO Committee on Right-of-Way, Utilities, and Outdoor Advertising Control—Technical Council on Utility Mapping, Geographic Information System (GIS) & Subsurface Utility Engineering (SUE); Technical Council on Utility Accommodation and Safety; Technical Council on Utility Project Scoping & Coordination

- AASHTO Participation, working with technical subcommittees in development of research needs statements for NCHRP projects and syntheses
- Reviewer, ASCE *Journal of Construction Engineering and Management*
- Reviewer, ASCE *Journal of Management in Engineering*
- Reviewer, *Transportation Research Record*
- Reviewer, *International Journal of Construction Education and Research*
- SME, FHWA EDC-6 Innovation e-Ticketing and Digital As-Builts

Peter Taylor, Director, CP Tech Center

- Member, ASCE
- Member, ASTM Concrete and Concrete Aggregates Committee (C-09)
- Member, TRB Durability of Concrete Committee (AFN30)
- Member, ACPA Strategic Advisory Council
- Member, ACI Iowa Chapter
- Vice-Chair, ACI Concrete Pavements Committee (ACI 325)
- Chair, ACI Concrete Overlays Subcommittee (ACI 325-F)
- Member, International Society of Concrete Pavements Board
- Team Lead, ACPA / CP Tech monthly seminars
- Chair, ACI Iowa Better Concrete Conference Planning Committee
- Member, ACPA Strategic Advisory Board
- Member, FHWA Sustainable Pavements Technical Working Group
- Mentor, Mentor Matching Engine (program to supervise high school science fair projects in Illinois)

Steven Tritsch, Associate Director, CP Tech Center

- Member, TRB Design and Rehabilitation of Concrete Pavements Committee (AKP20)
- Friend and Past Chairman, TRB Concrete Pavement Construction and Rehabilitation Committee (AKC50)
- Member, TRB Pavement Maintenance Committee (AKT30)

David Veneziano, Safety Circuit Rider, LTAP

- Member, TRB Road Weather Committee (AKR50)
- Member, NLTAPA Innovation & Implementation Work Group

Kejin Wang, PCC Engineer, CP Tech Center

- Senior Editor, *Journal of Construction and Building Materials*
- Editor, *Journal of Construction and Building Materials*
- Editor, *Journal of Sustainable Construction Materials and Technologies*
- Associate Editor, ASCE *Journal of Materials in Civil Engineering*
- Editorial Board Member, ASTM *Advances in Civil Engineering Materials*
- Proposal Review, Oak Ridge Associated Universities (ORAU)-Nazarbayev University on concrete overlay
- Ad-Hoc Reviewer, NSF EPSCoR RII Track-4
- Reviewer, National UTC TriDurLE Proposal
- Reviewer, National Science Centre Poland Proposal, Panel: ST8 (Production and Processes Engineering), Funding scheme: PRELUDIUM-18
- Chair, TRB 2nd International Conference on Nanotechnology of Cement and Concrete (2NCC20) Scientific Committee

- Member, 5th International Conference on Structural Engineering and Concrete Technology (ICSECT'20) Scientific Committee
- Member, International Conference on Cement-Based Materials Tailored for a Sustainable Future Scientific Committee
- Member, 7th International Conference on Durability of Concrete Structures Scientific Committee
- Member, 3rd International Conference on Innovative Technologies for Clean and Sustainable Development (ITCSD2020) Scientific Committee
- Member, International Conference on Multi-Scale Characterization of Cement Based Materials: from Fluid to Solid Organizing Committee
- Chair, ACI Spring Convention session on Unlocking Workability Issues of ultra-high-performance concrete (UHPC)—Part 1 and Part 2
- Work with a group in US and Australia on organization of the Seventh International Symposium on Nanotechnology in Construction (NICOM7)

Paul Wiegand, Director, SUDAS

- Chair, APWA Iowa Chapter History Committee

Chris Williams, Director, AMPP

- Member, ASCE
- Member, ASTM
- Member, Association of Asphalt Paving Technologists
- Member, National Stone, Sand, & Gravel Association Research Advisory Board
- Member, TRB Surface Requirements of Asphalt Mixtures Committee (AFK40)
- Reviewer, *Transportation Research Record*
- Reviewer, *Journal of the Association of Asphalt Paving Technologists*
- Reviewer, ASCE *Journal of Materials in Civil Engineering*
- Reviewer, ASCE *Journal of Transportation Engineering*
- Reviewer, *Journal of ASTM International*
- Reviewer, *Journal of Testing and Evaluation*
- Participant, Greater Iowa Asphalt Conference
- Fulbright Specialist—continuing, Fulbright Foundation

Jonathan Wood, Faculty Affiliate, CTRE

- Member, TRB Statistical Methods Committee (ABJ80)
- Member, Road Safety and Simulation (RSS) Conference Scientific Review Committee
- Member, Ford Global Data Insight & Analytics (GDI&A) Annual Conference 2020 Program Committee
- Panel Member, NCHRP 22-49: The Effect of Vehicle Mix on Crash Frequency and Crash Severity
- Panel Member, NCHRP 22-45: Informing the Selection of Countermeasures by Evaluating, Analyzing, and Diagnosing Contributing Factors that Lead to Crashes
- Reviewer, *Accident Analysis & Prevention*
- Reviewer, *Transportation Letters: The International Journal of Transportation Research*
- Reviewer, *Transportation Research Record*
- Reviewer, SAE International WCX World Congress Experience ■

REVIEW OF OUR STAKEHOLDERS AND IDIQs

InTrans collaborated with numerous external funding agencies and subcontractors over the past year in efforts to provide tangible research and products to advance the transportation field.

SPONSORS

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Wisconsin Department of Transportation
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University of Nebraska Medical Center
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University of Texas at Austin
University of Wisconsin–Madison
Wiss, Janney, Elstner Associates Inc.
Woodland Consulting
WSP USA

IDIQs

Collection of MIRE FDE on Non-State-Owned Public Roads
Lead PI: Omar Smadi
Technical Support for Roadway Information Database for Safety Training and Analysis Center (STAC)
Lead PI: Omar Smadi
Developing Guidance Documents and Training Workshops to Support Enhancement of the State DOTs Transportation Asset Management Plans
Lead PI: Omar Smadi
Rural Speed Safety Project for USDOT Safety Data Initiative
Lead PI: Shauna Hallmark
Enhancing Conspicuity for Standard Signs and Retroreflectivity Strips on Posts
Lead PI: Shauna Hallmark
SHRP2 Naturalistic Driving Study Pooled Fund: Advancing Implementable Solutions - Phase II
Lead PI: Shauna Hallmark ■



Aerial view of a highway expansion project underway on US 30 in Tama County, Iowa
Project: Field Monitoring of Erosion and Sediment Control Practices
Sponsors: FHWA and Iowa DOT; Partner: Auburn University



Smart arrow board at the beginning of a work zone in Iowa
Project: Developing a Research-Grade Iowa Work Zone Database
Sponsor: Iowa DOT

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