

INTRANS EN ROUTE

ANNUAL REPORT
JANUARY 2021 TO
DECEMBER 2021



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.

Front Cover Photos

Top: Story County bridge near Ames, Iowa, that was evaluated in a recent research project led by BEC structural engineer, Behrouz Shafei, to better understand the behavior of cross-frames

Left: Epoxy injection demonstration during the July 2021 Bridge Preservation Open House, organized by Buchanan County and Iowa LTAP

Center: Researchers inspecting a data station setup as part of a phase two project that studied the impact of internally cured concrete paving on contraction joint spacing, spearheaded by CP Tech Center director, Peter Taylor

Right: Test track paving using a biopolymer-modified asphalt mixture during a phase two research project performed by AMPP director, Chris Williams

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12 Major accomplishments

Photo by University of North Carolina at Charlotte



20 InTrans 2021 event recap



22 Publications and patents

DIRECTOR'S MESSAGE



Photo by Christopher Gannon

I've talked about the road to success before—about the obstacles and hazards and the achievements too. If 2021 has shown us anything about the path ahead, it's that we must keep two eyes on the road and expect the unexpected. In doing that, InTrans is always ready for today's road and today's newest challenge.

At the end of fiscal year 2021, the annual budget for work at InTrans was nearly \$16 million. Despite the ongoing pandemic, InTrans continued to keep its promise to its partners—to create, share, and apply transportation knowledge.

We are grateful for the continued support of our partners in state agencies, industry groups, and the federal government. Together we are delivering the best practices, technologies, and results of our combined efforts. One example of this is the National Concrete Pavement Technology Center's \$6.5 million cooperative agreement with the Federal Aviation Administration (FAA), an endeavor ready to launch to success.

In engineering, we often talk about toolboxes of resources that can be mobilized to meet a given challenge. Well, at InTrans some of the best resources we have are our staff. Each year they find new ways to grow as scientists—from collaborating on innovative projects to sharing new perspectives. With their continued development, InTrans also grows.

We currently collaborate with over 30 faculty members from the Iowa State University College of Engineering, and we employ another 65 research scientists, traffic engineers, and professional staff. They are supported by 91 graduate and 61 undergraduate students who work on a variety of research and demonstration projects under the guidance of InTrans staff. This year the Department of Civil, Construction, and Environmental Engineering (CCEE) celebrated its 150th anniversary. We were happy to celebrate the occasion with those we've collaborated with on various projects over the years.

This has been a year of coming together. Although we resumed hosting in-person events in 2021, we still haven't forgotten the impact our virtual events and webinars had on participants in 2020. In 2021, InTrans' centers and programs organized and held over 40 in-person and nearly 60 virtual events, a few of which are highlighted in this report. Additionally, InTrans published 37 technical reports on completed projects, as well as 35 tech transfer summaries, 2 tech briefs, and 4 guides, all available for download on the InTrans website. This has been another unprecedented year, but InTrans took on the challenge.

At the same time, it's hard to think about progress in terms of years, especially because for many of us there is just so much more to do. We will certainly continue looking forward and envisioning the possibilities. But for now, just for today, let's celebrate how far we have come. ■

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 2021, AMPP researchers completed two multiphase projects for the Iowa Department of Transportation (DOT). The first project involved the opportunity to produce a bio-based polymer for use in asphalt, which could eventually replace butadiene—a dangerous material derived from crude oil petroleum. The second project was a validation study on new asphalt mixture design specifications that could help the Iowa DOT produce better balanced mixes. AMPP also completed a multiphase project in Oregon, which included the development and implementation of new chip seal performance specifications for the Oregon DOT.



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. In 2021, a total of 18 state DOTs participated in Aurora.

Aurora completed five research projects spanning several topics, including winter weather severity indices, road weather information system (RWIS) sensor density and location mapping, seasonal weight restriction model investigations, and the impact of atmospheric rivers in the transportation sector. Additionally, one Aurora project was ongoing through 2021 and four new projects were initiated.

Due to COVID-19, the Aurora Board's spring meeting was held virtually. The fall meeting was held on site in Phoenix, Arizona, with a virtual option. 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)

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

The year 2021 brought exciting new projects to the BEC, many of which were in partnership with the Iowa DOT. These projects included continued expansion of the BEC's autonomous structural health monitoring network (the Bridge Engineering Condition Assessment System [BECAS]), improvements to bridge details at both the state and county levels, and many other projects with both laboratory and field components.

The BEC continued its partnership with the Accelerated Bridge Construction (ABC) University Transportation Center, with projects focusing on both new materials and techniques and the expansion of existing ABC strategies. Ongoing projects funded by the Federal Highway Administration (FHWA) created opportunities for collaboration with partners across the country via BEC-hosted workshops and meetings.



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 2021. Current projects are aimed at innovation.

One multiphase project with the Iowa DOT is looking at low-cost rural surface alternatives using stabilization methods that employ various types of virgin and recycled materials. This project will result in an implementation-ready guide for county and district engineers. Currently in Phase III, researchers are working on demonstration sections in Hamilton County that will cover a range of different aggregate sources, subgrade soil types, and weather conditions. Another project completed in 2021 was aimed at evaluating the effects of geogrid reinforcement widely used in pavement foundations.



CENTER FOR TRANSPORTATION RESEARCH AND EDUCATION (CTRE)

Director: Omar Smadi

The Center for Transportation Research and Education (CTRE) performs transportation-related research and outreach activities. CTRE faculty, staff, and students remain engaged across several research and development areas, including smart work zones, safety, traffic operations, connected and autonomous vehicle initiatives, pavement markings, and asset management.

CTRE researchers were recently awarded a project to support Iowa DOT snowplow drivers' navigation during whiteout or blizzard conditions; future research on this topic could lead to higher levels of autonomous winter operations. Researchers are also actively conducting a project that will adapt radar and camera systems to automate the audible warning system used by the Iowa DOT to protect roadway workers. These types of projects have national-level interest and are scalable across the US.

Despite the ongoing pandemic, CTRE researchers have continued to pursue and win projects, lead and participate in national committee activities, and provide technology transfer through a variety of unique delivery methods.



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. In 2021, CWIMS administered the FHWA Aurora Pooled Fund, collaborated with CTRE on the Minnesota DOT project *Evaluation of Road Weather Messages on DMS Based on Roadside Pavement Sensors*, and supported the Iowa DOT in several efforts, including the following:

- Investigated the possible relationship between snowfall totals and crash experience
- Spatially and temporally compared weather conditions, reported road conditions, and weather-related crash experience
- Assisted in incorporating weather metrics into operational decision-making and the evaluation of crash causation
- Supported the ongoing implementation and enhancement of the Pikalert System

CWIMS also coordinated with the National Weather Service in an effort to investigate crash experience in relation to winter weather forecasts.



CONSTRUCTION MANAGEMENT AND TECHNOLOGY (CMAT) PROGRAM

Director: Jennifer Shane

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

In 2021, CMAT continued working on a 2016 FHWA Work Zone Training grant on post-construction project evaluation and several National Cooperative Highway Research Program (NCHRP) projects. The latter included 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.

Additionally, in 2021 CMAT worked on projects for the Kentucky Transportation Cabinet (KYTC) and Iowa DOT. The KYTC project involved integrating the cabinet's highway design and utility coordination processes, along with the development of associated training. The Iowa DOT projects involved utility coordination and a peer exchange on alternative project delivery methods.



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.

In 2021, the Iowa LTAP team continued to adjust to the impacts of the COVID-19 pandemic. The program reintroduced on-site instruction and continued to offer online training. Iowa LTAP continued to offer at least two webinars a month. This year, several partners also reached out to Iowa LTAP to assist with their online and on-site outreach events. Overall, it is estimated that more than 4,000 people attended one or more of Iowa LTAP's on-site, "live" online, and recorded training events.

Information about all available Iowa LTAP training, along with additional online opportunities that may be of interest from other organizations, continued to be advertised to local agencies through a biweekly resource email, newsletter, Facebook page announcements, and other channels. Iowa LTAP's technical assistance, equipment loans, and road safety reviews continued.



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 continued to conduct meetings virtually due to the COVID-19 pandemic. In 2021, SUDAS staff focused on revisions to the traffic signal design and specifications sections, updates to erosion and sediment control specifications, and updates to the Complete Streets design manual based on the results of an Iowa DOT study.

SUDAS staff also started working on their newest project: the Iowa Public Works Service Bureau (PWSB). This Iowa Highway Research Board (IHRB) project started March 1, 2021, and the first task accomplished was to hire a new staff member. The PWSB website was launched in early August, and staff have been constantly working to expand and improve the content included on the website.



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 10 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 2021, research was completed that sought to further evaluate work zone safety using naturalistic driving study data collected through the Second Strategic Highway Research Program (SHRP2). The goal of this research was to more fully investigate work zone safety using the unique data available, in particular the role of speed and distraction in work zone crashes and near crashes.



NATIONAL CENTER FOR WOOD TRANSPORTATION STRUCTURES (NCWTS)

Acting Director: Justin Dahlberg

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

In 2021, the NCWTS continued work on two ongoing research projects with its collaborative partner, the United States Department of Agriculture (USDA) Forest Products Laboratory (FPL): (1) identification of research needs for timber transportation structures and (2) a laboratory investigation of cross-laminated decks for bridge applications.

Furthermore, NCWTS partnered with FPL on a project sponsored by the Wisconsin DOT to develop analytical and testing methods for rating longitudinal laminated timber slab bridges. As a result of the research, the Wisconsin DOT received updated vehicle load distribution equations developed from the field testing, modeling, and analysis of 10 timber bridges in the state of Wisconsin and will likely be able to remove or reduce current postings and limit postings on future load ratings.



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.

In 2021, the CP Tech Center continued to conduct most of its work online, including national webinars in collaboration with the American Concrete Pavement Association (ACPA), with approximately 200 people attending each session.

A cooperative agreement with the FHWA 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.

Ongoing research in 2021 included projects to understand the effects of superabsorbent polymers in concrete and vibration on concrete mixtures, develop sustainable concrete mixtures, and construct long-lasting overlays with and without fibers in the mixtures.



Photo by ACPA

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 sustainable highway and airport pavement infrastructure systems.

Despite the challenges associated with the COVID-19 pandemic, the PROSPER team was able to successfully work on over 25 funded research projects in 2021. This included completing a demonstration project for a self-heating electrically conductive concrete (ECON) pavement system, 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 2021, PROSPER was also awarded five major research projects that will allow the team to explore 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 program, the 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.

In 2021, the lab's research team continued its work in developing technology to transform continual data streams into decision support information and solutions. The team also continued to support the Iowa DOT's Connected Vehicle initiatives through projects that address topics ranging from the Signal Phasing and Timing (SPaT) Challenge to automated traffic signal performance measures, smart arrow boards, and automation of the Iowa DOT's audible alert system.



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.

In 2021, the pooled fund collected problem statements from researchers and released a request for proposal (RFP) focused on two subjects: improvements to speed feedback signs and the mobility/safety impacts of different lane/shoulder width combinations in work zones. A review and ranking of the proposals submitted resulted in two projects being selected for funding. Three additional SWZDI-funded research projects were completed in 2021 and their project reports posted online. Four ongoing SWZDI projects also continued through 2021.

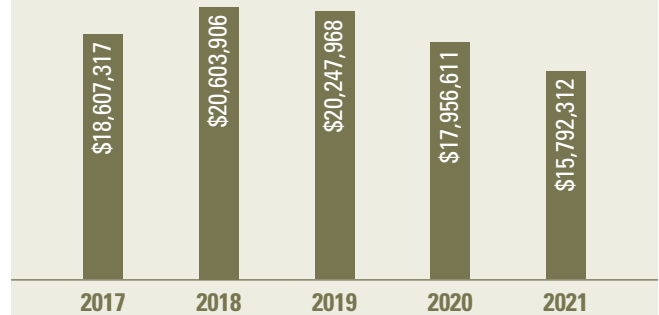


INTRANS BY THE NUMBERS

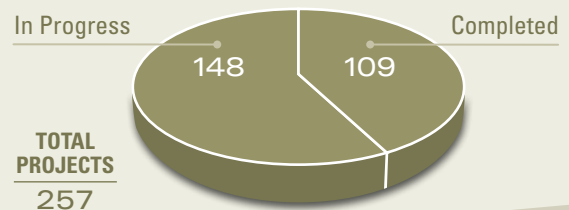
Reports below reflect figures and activities from the fiscal reporting period of July 2020–June 2021

FUNDING SOURCES	2017	2018	2019	2020	2021
Iowa DOT	41%	44%	50%	53%	48%
Other Iowa Govt. Agencies	1%	1%	1%	1%	2%
Other State Agencies	2%	2%	9%	8%	12%
Other (conferences, fees, misc. services, etc.)	12%	15%	14%	16%	12%
Industry	5%	7%	9%	7%	8%
Federal Agencies	39%	31%	17%	15%	18%

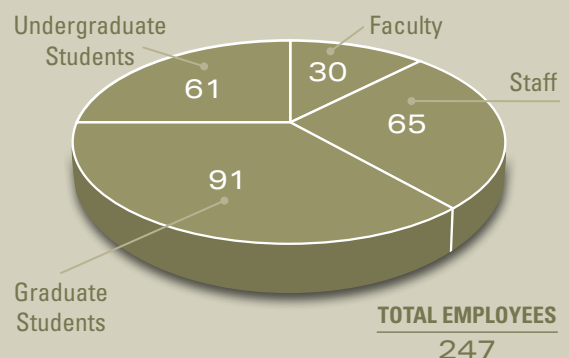
TOTAL FUNDING FROM ALL SOURCES



FY 2021 INTRANS PROJECTS



FY 2021 EMPLOYEE STATISTICS



MAJOR ACCOMPLISHMENTS

If 2020 reminded us of the importance of staying connected while being apart, 2021 helped us remember the satisfaction of seeing each other face to face once again—even if the ongoing pandemic prompted many of us to cover part of our faces.

During the late spring and early summer, event organizers held and began planning the first in-person conferences, workshops, and presentations since March 2020. July also brought InTrans staff back together in the office, though many meetings offered hybrid formats to accommodate everyone's needs.

Wherever and however staff and students chose to collaborate, the work at InTrans continued as it always has—by translating the research into action. Some of the highlights from InTrans' centers and programs are as follows.

CP TECH CENTER PUBLISHES THREE GUIDES IN 2021

It was a busy year for the CP Tech Center, which saw the publication of three guides in 2021.

The CP Tech Center published the *Guide to Lightweight Cellular Concrete for Geotechnical Applications* in February, the *Guide to Concrete Overlays* (Fourth Edition) in November, and *Quality Control for Concrete Paving: A Tool for Agency and Industry* in December.

The former guide was developed in collaboration with the Portland Cement Association, and the latter two were published with funding from and as part of the FHWA cooperative agreement Advancing Concrete Pavement Technology Solutions.

For the CP Tech Center, 2022 is shaping up to be another busy year, with more publications already in progress.

Additional details about each of the guides published in 2021 are given in spotlight sections on this and the following pages.

SUDAS' IOWA PUBLIC WORKS SERVICE BUREAU

The Iowa SUDAS program has taken on the daunting—but exciting—challenge of creating a new public works service bureau in Iowa to connect the state's more than 900 city agencies.

Accomplishments continued on page 13



Unbonded concrete overlay on Missouri Route D
(Photo by Todd LaTorella, ACPA, MO/KS Chapter)

GUIDE SPOTLIGHT



National Concrete Pavement
Technology Center



GUIDE TO CONCRETE OVERLAYS (FOURTH EDITION)

Concrete overlays have matured into a standard rehabilitation option for public agencies during the past four decades as they've been shown to be an economical, long-lasting solution to extend the life of an existing pavement. In addition, concrete overlays can contribute meaningfully to an agency's overall asset management program and have the potential to provide service lives of 30 to 40 years.

Since 2007, the CP Tech Center has published successive editions of the *Guide to Concrete Overlays* to present to pavement engineers the basic principles needed to design and construct concrete overlays on existing asphalt, composite, and concrete pavements.

The latest edition of the *Guide to Concrete Overlays* features updates that include current information on continuously reinforced concrete pavement (CRCP) overlays, geotextile separation layers, fiber reinforcement, design procedures, and lessons learned from the experiences of numerous state highway agency engineers. ■

The PWSB will provide a mechanism to establish much-needed communication between public works departments and will be responsive to ongoing and emerging public works initiatives and concerns.

“Development of the Public Works Service Bureau will fundamentally change information exchange between cities of all sizes, as well as allow for the analysis of data to improve the efficiency and effectiveness of public works operations across the state,” said SUDAS Director Paul Wiegand, who is the principal investigator on the project.

Some of the anticipated benefits of the PWSB are that it will provide the following:

- Invaluable tools and resources for public works departments that provide essential services
- Efficient use of public resources to maintain infrastructure, which is critical to long-term sustainability
- Specific data that help public works staff and civic leaders make informed decisions and policies to improve quality of life
- Stable and sustainable communities through the in-depth understanding of the workings of public works departments

- Improved infrastructure operational efficiencies through the cultivation of communication between agencies

Work is currently underway at SUDAS to continually enhance the newly developed PWSB website, establish a permanent advisory committee, and secure permanent funding with a Road Use Tax Fund off-the-top allocation.

“Our contract started March 1st [2021], and we have hit the ground running,” said SUDAS Program Coordinator Beth Richards, who is a co-author on the project. “The new website launched in August, and we have been promoting and improving it ever since. We are also working on a major project task of marketing, marketing, marketing!”

Accomplishments continued on page 14



GUIDE SPOTLIGHT

National Concrete Pavement
Technology Center

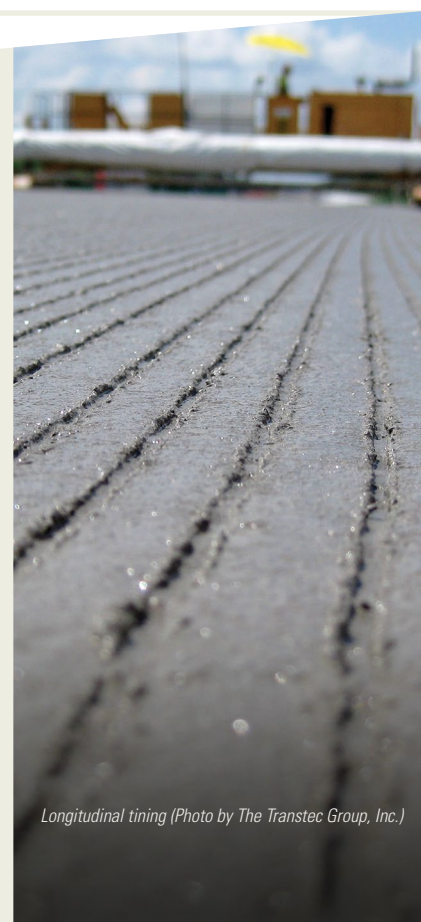


QUALITY CONTROL FOR CONCRETE PAVING: A TOOL FOR AGENCY AND INDUSTRY

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

This guide was developed to help contractors develop or enhance their existing QC programs and plans and to familiarize agencies with the components of QC for concrete paving projects. The guide can also show agency personnel the components and approaches that comprise a comprehensive QC plan for concrete paving projects, the ways such a QC plan benefits an agency, and ways to appropriately incorporate QC requirements into specifications.

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



Longitudinal tining (Photo by The Transtec Group, Inc.)

WHEELS UP: CP TECH CENTER AND FAA AGREEMENT IN FLIGHT

In September 2020, the CP Tech Center signed a five-year, \$3.5 million cooperative agreement with the FAA to administer wide-ranging design, materials, and construction research contracts for the new Airport Concrete Pavement Technology Program (ACPTP).

Since that time, the CP Tech Center has been gaining speed to get the program off the ground. The FAA added \$3 million to the agreement in April 2021, and the CP Tech Center announced its first RFP under the program in July of that year. In total, the CP Tech Center announced three RFPs in 2021.

The ACPTP aims to address the research needs for concrete pavements at airports so that technologies demonstrated to extend the life of airfield pavement and to improve airfields are increasingly implemented.

The focus is not on inventing the “next big thing” but rather on advancing 21st century solutions for concrete pavement design, construction, and materials important to airfield reliability, efficiency, and safety. The overarching goal is to keep America moving forward.

The ACPTP grew out of a 2001 law passed by the U.S. Congress that established a research program to improve airfield concrete pavements, which was later expanded to include asphalt as well under the Airport Pavement Technology Program (ATPT).

PROSPER PROJECT ON SELF-HEATING ELECTRICALLY CONDUCTIVE CONCRETE HEATS UP

A recently completed PROSPER project successfully demonstrated a full-scale implementation of an ECON heated pavement system (HPS).

As part of the project, 10 ECON HPS test slabs with different electrode configurations were constructed at the Iowa DOT headquarters. All test slabs showed promising snow- and ice-removal capabilities through various winter weather events. These results could spur interest in further projects using this technology in other critical areas of Iowa’s transportation infrastructure systems.

“The versatility of the ECON HPS technology demonstrated in this study is such that it can eventually be custom designed and optimized for each specific transportation infrastructure application depending on need and interest,” said PROSPER Director Halil Ceylan, who led the demonstration project.

The use of heated pavement systems is expected to result in expedited, efficient, and cost-effective snow removal operations that can reduce traffic delays and costs. Other potential benefits include the prevention of traffic safety issues, damage to pavements and vehicles, and environmental contamination (resulting from the use of large quantities of deicer salts) in the future. ■



Lightweight dam and levee structural fills
(Photo by Cell-Crete Corporation)

GUIDE SPOTLIGHT



National Concrete Pavement
Technology Center

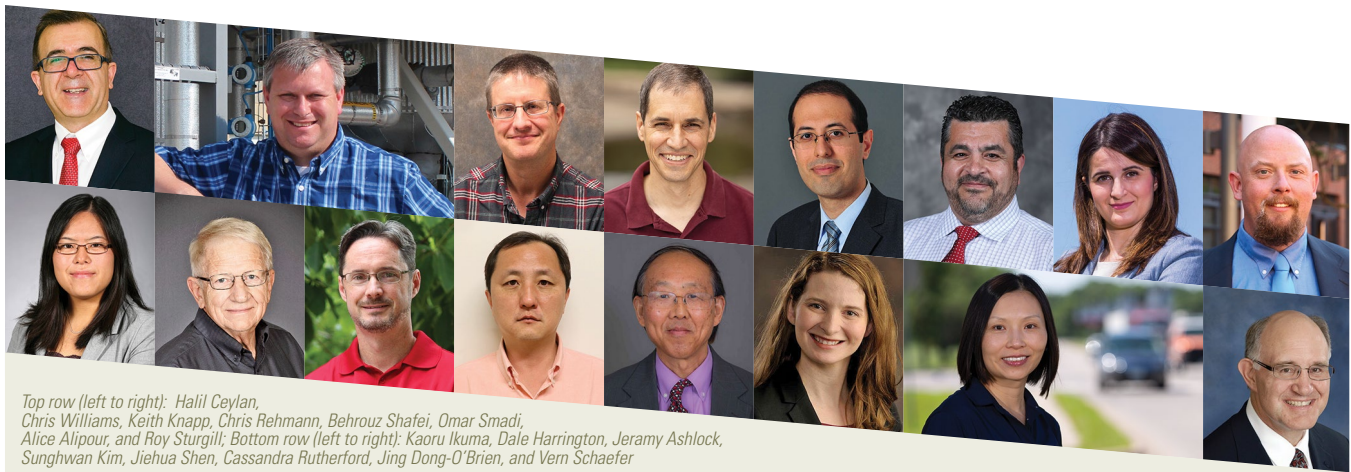


GUIDE TO LIGHTWEIGHT CELLULAR CONCRETE FOR GEOTECHNICAL APPLICATIONS

Long used as a construction product for flooring systems, lightweight cellular concrete (LCC)—a mixture of portland cement and water slurry combined with preformed foam to create air voids—has continued to expand its applications into a variety of fields, including the geotechnical industry.

This guide was developed to provide information for construction professionals and design engineers on the use of LCC specifically in geotechnical applications. It focuses on the materials, properties, design, and proper handling of LCC for geotechnical applications and presents common uses, conceptual guidance, and design guidelines. ■

AWARDS AND HONORS



FACULTY AWARDS

Ceylan appointed Pitt-Des Moines Inc. Professor in Civil Engineering

PROSPER Director Halil Ceylan was named the Pitt-Des Moines Inc. (PDM) Professor in Civil Engineering by the CCEE department. PDM contributed \$1 million to the Iowa State University Foundation in 2001 to establish the Pitt-Des Moines Inc. Endowed Professorship in Civil Engineering. This endowed faculty position was the first for CCEE and focuses on steel construction education and research.

ACS recognizes bio-based asphalt research team

AMPP Director Chris Williams is part of a research team that earned recognition from the American Chemical Society (ACS) for its research on bio-based thermoplastic polymers for paving processes. The team received the 2021 Cooperative Research Award in Polymer Science & Engineering, which recognizes and encourages sustained cooperative research between industrial and academic or industrial and national laboratory scientists. The team also includes Iowa State Department of Chemical and Biological Engineering (CBE) Professor Eric Cochran and industrial partner Donald Sjogren of Seneca Petroleum Company.

Knapp earns ICEA Special Service Award

Iowa LTAP Director Keith Knapp got a pleasant surprise at the end of the 2021 Iowa County Engineers Association (ICEA) Annual Meeting when it was announced he received the organization's Special Service Award. The award is given to one to two individuals each year in recognition of their many contributions to the engineering profession and their continuing effort to bring credit to the field of county engineering. It honors those who have furthered the development of ICEA, county engineers, and county engineering nationwide.

Alipour, Dong-O'Brien receive teaching excellence awards

Iowa State Associate Professors Alice Alipour and Jing Dong-O'Brien earned both of the CCEE department's Charles W. Schafer Award for Excellence in Teaching, Research, and Service in 2021. Alipour is also a structure and infrastructure engineer with the BEC, and Dong-O'Brien is also a transportation engineer with CTRE. The award promotes excellence in teaching, research, and service by junior faculty members. Two awards are given per year to faculty members who hold an academic rank below that of professor.

CPTech Center's founding director earns recognition

Dale Harrington's more than 50 years in the transportation engineering industry were recognized in the form of an honorary membership in the International Society for Concrete Pavements (ISCP) during the organization's quadrennial conference in fall 2021. Honorary membership is given to "individuals that have provided exemplary service to the Society and/or to the improvement of concrete pavement technology," per the organization. Harrington is the founding director of the CP Tech Center and the Iowa SUDAS program, the latter of which also honored Harrington with a Chapter Service Award in 2021.

Kim recognized with Iowa State University excellence award

PROSPER Associate Director Sunghwan Kim received the Iowa State University Professional and Scientific Excellence Award at a ceremony in fall 2021. The award recognizes professional and scientific staff who have been with Iowa State for more than five years, contributed to their respective fields both within and beyond the university, and demonstrated career progress through accomplishments at Iowa State.

Alipour, Ashlock recognized for “exceptional effort” in pandemic

Among the recipients of Iowa State’s COVID-19 Exceptional Effort Awards in 2021 were Alice Alipour, BEC structure and infrastructure engineer and CCEE associate professor, and Jeremy Ashlock, InTrans faculty affiliate and CCEE associate professor.

Alipour was recognized with the Excellence in Remote Instruction Award for transforming and improving the delivery of one of the most challenging courses in the structural engineering program.

Ashlock was recognized with the Excellence in Face-to-Face Instruction Award for his exceptional simultaneous delivery of in-person and online instruction through the innovative use of technology and training.

Iowa State announced the awards in 2020 to recognize the extraordinary and innovative ways that people at Iowa State have strived to overcome the challenges of the pandemic.

Sturgill earns award for excellence in undergraduate teaching

Roy Sturgill, CMAT construction engineer and CCEE assistant professor, was among two winners recognized by CCEE to receive the Joseph C. and Elizabeth A. Anderlik Faculty Award for Excellence in Undergraduate Teaching in 2021. The award promotes excellence in teaching by CCEE faculty members who teach at least one undergraduate course per year. Two awards are given annually, one to a tenured/tenure-track faculty member and one to a term faculty member.

Ceylan elected to ASCE Fellow

PROSPER Director Halil Ceylan joined the ranks of just 3% of American Society of Civil Engineers (ASCE) members by being elected an ASCE Fellow in 2021. ASCE Fellows have made celebrated contributions and developed creative solutions that change lives around the world. Fellow status is achieved through professional accomplishments and election by a committee of ASCE members. Minimum requirements are 10 years of responsible charge in the grade of Member and a P.E. or P.L.S. license.

Canadian asphalt association recognizes AMPP research team’s paper

A research team that includes AMPP Director Chris Williams earned the Elaine Thompson Award for the best written paper from the Canadian Technical Asphalt Association. The paper was entitled “Using Bio-Modifiers for Recycling RAP and Improving the Performance of RAP-Incorporated Mixtures Designed for Different Pavement Demonstration Projects.” The paper summarized results from performance tests on bio-modified asphalt binders and mixtures that contained varying amounts of reclaimed asphalt pavement (RAP) and that had been prepared for demonstration projects in four Midwest locations. The research team included Williams, Ali Arabzadeh, Maxwell D. Staver, Joseph H. Podolsky, and Eric W. Cochran.

Faculty affiliate Cassandra Rutherford receives early career educator award

Cassandra Rutherford, InTrans faculty affiliate and CCEE assistant professor, received the U.S. University Council for Geotechnical Education and Research (USUCGER) Early Career Educator Award. Given biennially, the award recognizes an affiliate of a USUCGER member institution who has provided educational and/or professional development services to the USUCGER community. Rutherford was one of two award winners in 2021.

Faculty affiliate Jiehua Shen receives teaching award

Jiehua (Jay) Shen, InTrans faculty affiliate and CCEE associate professor, received the Outstanding Achievement in Teaching Award from Iowa State’s College of Engineering. The award recognizes faculty members with more than five years of teaching experience at Iowa State for outstanding teaching performance over an extended period of time.

Ceylan receives 2021 Laurie Prize from ASCE

The American Society of Civil Engineers (ASCE) honored PROSPER Director Halil Ceylan with the 2021 James Laurie Prize for significantly advancing transportation engineering with his career contributions in smart, sustainable, and resilient transportation infrastructure systems. Ceylan is the first recipient of this award from the state of Iowa.

Five InTrans staff and faculty affiliates earn Joel and Judy Cerwick awards

Five InTrans staff members or faculty affiliates earned awards in 2021 named for CCEE department alumnus Joel Cerwick, who received his bachelor’s and master’s degrees in Civil Engineering from Iowa State in the 1960s. Chris Rehmann, InTrans faculty affiliate and CCEE associate professor, was named to the Cerwick Faculty Professorship. InTrans staff members and CCEE associate professors Alice Alipour, Behrouz Shafei, and Omar Smadi and InTrans faculty affiliate and CCEE assistant professor Kaoru Ikuma received the Cerwick Faculty Fellowship.

The awards were established in 2013 by Joel and Judy Cerwick to recognize and promote the excellence of CCEE faculty and to acknowledge the role environmental engineering faculty played in Joel Cerwick’s life.

Schaefer receives ASCE award for innovation

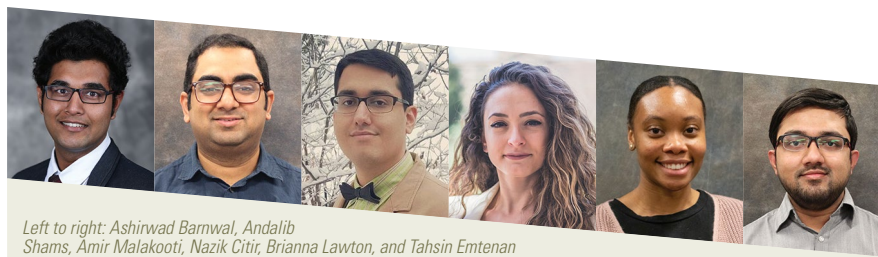
Vern Schaefer, interim director of CEER and affiliate researcher with the CP Tech Center, received the 2021 Wallace Hayward Baker Award from the Geo-Institute of the ASCE. The award, only one of which is given each year, recognizes ingenious innovation in the field of ground modification. It was established in 2000 by the Geo-Institute, a membership organization focused on geo-professionals and the geo-industry.

Alipour named senior fellow at Collegium Helveticum through ETH Zurich

Alice Alipour, BEC structure and infrastructure engineer and CCEE associate professor, was named a 2021 senior fellow at the Collegium Helveticum through ETH Zurich, a public research university in Switzerland. A joint initiative of the ETH Zurich, the University of Zurich, and the Zurich University of the Arts, the Collegium Helveticum aims to provide a forum for dialogue between the humanities, social sciences, physical sciences, engineering, medical science, and the arts. As a senior fellow, Alipour explored innovative, multidisciplinary solutions to transform the safety and performance of critical interdependent infrastructure systems subjected to disruptions by natural hazards.

Ceylan recognized as University of Illinois Distinguished Alumni

PROSPER director Halil Ceylan received the 2021 Civil and Environmental Engineering Alumni Association Distinguished Alumnus Award from his alma mater, the University of Illinois at Urbana-Champaign. Ceylan earned both his master's degree and doctorate in civil engineering from the university. The award has a long history of recognizing only the best and most outstanding alumni from the university's Department of Civil and Environmental Engineering.



Left to right: Ashirwad Barnwal, Andalib Shams, Amir Malakooti, Nazik Citir, Brianna Lawton, and Tahsin Emtenan

STUDENT AWARDS

InTrans graduate students win ITS Minnesota scholarship awards

InTrans graduate students Ashirwad Barnwal and Andalib Shams won both of the 2021 ITS Minnesota Graduate Student Scholarship awards. Each year, ITS Minnesota awards scholarships to two graduate students from a five-state region to recognize exceptional students for their interest in the transportation industry, particularly intelligent transportation systems (ITS). The awards are based on ITS-related work that may include a paper, project, or research done by the student.

InTrans graduate students flex skillset, win Leadership Award

InTrans graduate students Amir Malakooti and Nazik Citir received recognition in 2021 for their leadership efforts by the Graduate and Professional Student Senate (GPSS), a recognized independent representative body of graduate students at Iowa State. The Leadership Award, given to five winners annually, recognizes Iowa State graduate students who are actively involved in leadership roles. Both students are studying under PROSPER Director Halil Ceylan.

InTrans women win WTS awards

InTrans women once again earned well-deserved recognition from WTS International, an organization dedicated to supporting women in the transportation industry. In 2021, the WTS Greater Chicago Area Chapter awarded InTrans doctoral students Brianna Lawton and Nazik Citir with scholarships. Lawton was awarded the Maggie Walsh Leadership Legacy Scholarship, and Citir was awarded the President's Scholarship. InTrans women have won scholarships from the WTS Greater Chicago Area Chapter in each of the last six years.

InTrans graduate student receives TRB exceptional paper award

InTrans graduate student A.M. Tahsin Emtenan received an exceptional paper award from the Transportation Research Board (TRB) Committee on Traffic Signal Systems. The paper, "Impact of Turning Lane Storage Length and Turning Proportions on Throughput at Oversaturated Signalized Intersections," was co-authored with InTrans affiliate researcher Christopher Day, under whom Emtenan is studying as part of his graduate work. ■

INTRANS EVENTS OFFER THE BEST OF BOTH WORLDS

InTrans centers and programs have always done their best to meet people where they are, whether that means traveling the state to hold events or offering multiple sessions of the same training. In 2020, InTrans necessarily boosted its virtual offerings to accommodate a new type of audience: people working from home and social distancing due to COVID-19 restrictions.

Though in-person events resumed after vaccines became more widely available and most pandemic precaution requirements ended, InTrans continued to offer the best of both worlds.

Iowa LTAP held the first of InTrans' in-person events in late spring 2021, starting with two workshop series held throughout the state with limited attendance and social distancing requirements.

"In the mindset of embracing change, Iowa LTAP is offering some training alternatives," Iowa LTAP Director Keith Knapp wrote in March 2021, a year into the pandemic. "We will continue with some virtual events but will also phase in some small-group, limited-attendance, regional offerings of the training we have done annually for many years."

Even as in-person events resumed their usual format and restrictions were dropped, Iowa LTAP continued to hold webinars. The program typically held one virtual event a week for about a year, but as it began adding in-person events to its schedule, the webinars were scaled back to every other week. Iowa LTAP is continuing its biweekly virtual events in 2022.

InTrans events continued on page 19



Keynote speaker David Harkey addresses the 2021 Traffic and Safety Forum attendees

EVENT SPOTLIGHT



TRAFFIC AND SAFETY FORUM

Like many events across the country and at InTrans, there was no feasible way to hold the Traffic and Safety Forum in 2020 as a virtual option amidst the pandemic.

Its return in 2021 was welcome, shown by the 125 attendees who came together in November to hear a message highlighting the importance of roadway safety.

The event was held a week after Iowa reached a grim milestone: surpassing 300 roadway fatalities for the year. This prompted Iowa DOT Director Scott Marler to pose two questions to attendees: "What does safety mean to you?" and "How do you internalize the word safety?"

For many attendees, the answers came easily. They have lost friends and loved ones to traffic crashes, they know the public depends on them to provide solutions to make roadways safer, and they practice safe techniques, such as not looking at their smartphone while driving.

The themes of improving safety and making the story personal were also emphasized during the morning's keynote address by David Harkey, President of the Insurance Institute for Highway Safety (IIHS). "Everything that you do is so important, and it has to be a part of the safe systems approach," Harkey said, adding, "That's why it's so important to change behavior and infrastructure, because changes on vehicles take time."

The Traffic and Safety Forum is an annual event organized and hosted by the Iowa DOT and InTrans. The purpose of the forum is to enable traffic and safety engineering professionals to learn about new and innovative systems and processes, share individual experiences, and collectively address issues of interest. ■

Likewise, the CP Tech Center began holding in-person events in fall 2021 but is continuing its successful Concrete Pavement Technology Tuesday webinar series in partnership with the ACPA.

“We’re working to plan our 2022 CP Tech Center webinar schedule to cover the topics YOU say could help you most,” read a note to readers in the CP Tech Center’s December 2021 Resources newsletter.

Since spring 2020, the center has held 30 webinars in the series. The events drew more than 700 weekly participants at the peak of the pandemic restrictions in 2020, but they continue to have a regular attendance of more than 200 viewers from across the globe.

In addition to reaching beyond Iowa’s borders, these online sessions also offer the chance for audiences to catch up on the offerings after the fact as recordings for most virtual 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/ltap-webinar-recordings/. ■



EVENT SPOTLIGHT

National Concrete Pavement
Technology Center



IOWA BETTER CONCRETE CONFERENCE

The CP Tech Center’s Iowa Better Concrete Conference returned to an in-person format in November 2021 after the event had gone virtual in 2020 due to the ongoing pandemic. The opportunity to once again meet face to face was welcome.

“I got more done here in one day than in a normal week because everyone is here,” said Greg Mulder of the Iowa Ready Mixed Concrete Association/Iowa Concrete Paving Association.

More than 170 participants joined the conference in 2021. That was more than attended in 2019, the last time the event was held in person, and on par with each of the four webinars that together made up the virtual event in 2020.

The conference, held in conjunction with the Annual Meeting and Banquet of the American Concrete Institute’s Iowa Chapter, also included a luncheon to present the Iowa Excellence in Concrete Awards. This year’s event highlighted the I-74 Bridge and Des Moines Courthouse projects, as well as a presentation on precast concrete for turbines.

Organizing events both locally and beyond to share the most interesting projects, cutting-edge research, and valuable new technologies is part of the CP Tech Center’s mandate. ■

iowa
better
concrete
conference



Attendees at the 2021 Iowa Better Concrete Conference

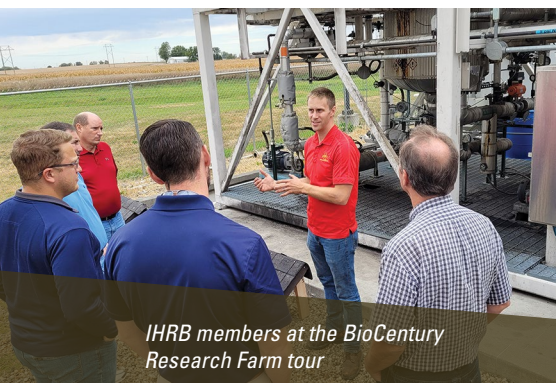
INTRANS 2021 EVENT RECAP



Epoxy injection demonstration during the Bridge Preservation Open House



Keynote speaker Devin Henderson kicks off the Iowa Streets and Roads Conference



IHRB members at the BioCentury Research Farm tour



Attendees getting hands-on training at the Introduction to Surveying course

IN-PERSON EVENTS

Alternative Project Delivery Peer Exchange (December 9, Ames)
Iowa Local Agency Pavement Management 2021 End of Year Workshop (December 7, Ames)
Traffic and Safety Forum (November 17, Ames)
Iowa Better Concrete Conference (November 9 and 10, Ames)
Winter Maintenance Workshops (several events held in November across Iowa)
Concrete Lunch & Learn Presentations: Design of Concrete Pavements (several events held in October and November across Iowa)
Multidisciplinary Roadway Safety Series (several events held in October across Iowa)
One-D Modeling of River Encroachments with HEC-RAS (NHI Course 135041) (October 12–14, Ames)
Aurora Fall Board Meeting (October 12–14, Phoenix, AZ)
IHRB tour at Iowa State University's BioCentury Research Farm (September 24, Ames)
Iowa Streets and Roads Workshop and Conference (September 21–23, Ames)
Introduction to Surveying (August 11 and 12, Ames)
Bridge Preservation Open House (July 27, Jesup)
ICEA Mid-Year Conference (July 8, Ames)
Motor Grader Operator Workshops (several events held in May and June across Iowa)
Work Zone and Flagger Workshop (several events held in April and May across Iowa)

VIRTUAL CPTECH CENTER EVENTS

Next Generation Concrete Pavement
Municipal Streets Webinars
Understanding Penetrating Sealers for Concrete Pavements
Machine vs. Concrete: Building Long-Lasting Concrete Pavements
Advancements in Performance-Engineered Mixtures (PEM)
Proper Resiliency Planning Prevents Disaster and Aids in Crisis Management—A Concrete Perspective
Innovation with Concrete Overlays for DOTs and Municipalities
Roller-Compacted Concrete for Roadway Applications
Concrete Overlays: A Proven Technology (Technical Overview)
An Introduction to Recycled Concrete Aggregate (RCA)
Spring 2021 National Concrete Consortium Webinars
Understanding the Value of Competition
Advancements in Our Knowledge and Action to Control Alkali-Silica Reaction (ASR)
Real-Time Control of Curing + Construction Productivity Research Study Invitation
Understanding the Application/Benefit of Fiber Reinforcement in Concrete
Dowel Bar Retrofit and Diamond Grinding Best Practices
Concrete Pavement Lunch & Learn Webinars

- Design of Concrete Pavements
- PCC Paving Inspection
- Sustainability and How the Industry is Reducing its Environmental Impact
- Troubleshooting Concrete Projects
- Subgrades and Subbases: Iowa DOT Research and Next Steps
- PCC Overlays: Fabric and Fiber

2021 event recap continued on page 21

VIRTUAL IOWA LTAP EVENTS

2021 Ethical Choices—What Would You Do?
Low-Cost Safety Improvements for Unsignalized Intersections
Low-Cost Safety Improvements for Roadsides
Low-Cost Safety Improvements for Roadway Curves and Segments
Introduction to Low-Cost Safety Improvements and Data Analysis
In-Service Sign Retroreflectivity Performance in Iowa
Crack Sealing Best Practices
Pavement Marking Material Selection and Application Preparation
Purpose and Types of Pavement Markings
MUTCD and Signing Basics
Take Action Now—Maintaining Safety
Maintaining a Safer Roadway
Countermeasures for Road Safety
Reading the Road
Safety Analysis Process
Systemic Safety Project Selection Tool
Accessible Sidewalks and Curb Ramps: Design to Installation
Because I Said So! (Team Productivity Without All the Stress)
Are All Your Bases Covered with DOT's Drug and Alcohol Testing and FMCSA Clearinghouse?
Worker Safety for Rural Bridge Construction
Design Length of Steel H-Piles and WEAP Equation
Just Drive: Distracted Driving Awareness Campaign
Iowa DOT Culvert and Bridge Backwater Program Workshop
Safety and Operational Effectiveness of Traffic Signs
Work Zone Driveway Assistance Devices (DADs): Past Research and Evaluation of Display Strategies

Completing Traffic Studies
Keep Your Pavements Zipped-Up! Best Practices for Long-Lasting Longitudinal Joints
2020 "Build a Better Mousetrap" Innovations (State and National)
Iowa Work Zone Safety Workshops
Composite Press-Brake Formed Modular Steel Tub Girders for County Bridges: Development, Experimental Validation, and Case Studies
Planning & Design Accommodation for Oversize & Overweight Freight in Work Zones
SWIZAPP—Smart Work Zone Activity App
Capabilities and Advantages of Steel Buried Bridges
Safety Countermeasures for Unpaved and Gravel Roads
Top 20 in Rural Bridge Replacement and Repair Innovations
Evaluating Statewide Bicycle and Pedestrian Safety Risk Through Systemic Analysis

OTHER VIRTUAL EVENTS

Aurora Spring Board Meeting

Recordings for most virtual 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/ltap-webinar-recordings/. ■



EVENT SPOTLIGHT



FIRST IN-PERSON EVENTS

Iowa LTAP was the first InTrans center/program to resume in-person events in 2021 as COVID-19 vaccines became more widely available and its clientele looked forward to gathering again.

Iowa LTAP staff began with two separate workshop series that they took across the state: Motor Grader Operator Training and Work Zone and Flagger Workshop. These earliest events, held in the spring, featured limited audiences and social distancing requirements. By the summer, Iowa LTAP events had returned to the usual format.

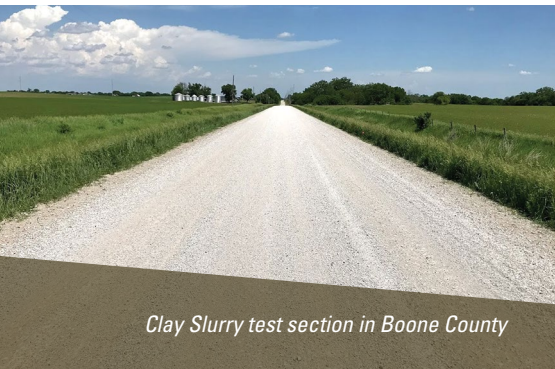
This return to normalcy was especially welcome when it came to holding the **Iowa Streets and Roads Workshop and Conference**, which had been canceled in 2020. **The fall 2021 event attracted 125 attendees, who learned leadership skills, visited with two dozen vendors between sessions, and heard the latest transportation developments for local agencies.** ■



Krisdeena Jansen, of GLUTRECK Engagement and Development, leads a presentation entitled "Defining Excellence" at the Iowa Streets and Roads Workshop that focused on Leadership Skills

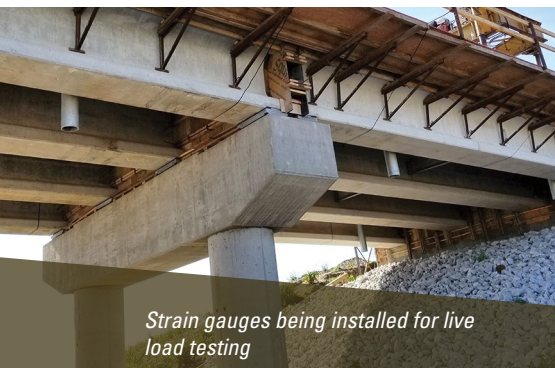
PUBLICATIONS AND PATENTS

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.



Clay Slurry test section in Boone County

Project: Use of Waste Quarry Fines as a Binding Material on Unpaved Roads



Strain gauges being installed for live load testing

Project: Implementation of the Negative Moment Reinforcing Detail Recommendations



Chevron warning signs guiding traffic around a bend on a rural road

Project: Traffic Sign Life Expectancy

These deliverables were the products of research efforts that spanned all aspects of the nation's transportation system: roadways, bridges, traffic signage, data analytics, asset management, 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

- Iowa Automated Permitting System Report to Legislature
- Iowa DOT Synthesis of Transverse Rumble Strips at Rural Stop-Controlled Intersections
- Investigation of Autonomous/Connected Vehicles in Work Zones
- Fiber-Reinforced Concrete for Bridge Decks
- Use of Waste Quarry Fines as a Binding Material on Unpaved Roads
- Self-Heating Electrically Conductive Concrete Demonstration Project
- Data Driven Identification of Candidates for Operational Improvement
- Pedestrian Accommodations in Work Zones: Systematic Literature Review and Research Needs
- Experimental Validation of a Rapid Assessment Tool for Pile Capacity and Stability in Response to Scour Situations

JULY–SEPTEMBER

- Updates to AASHTOWare Pavement ME Design Software Affecting Concrete Pavements: A Synthesis of the Changes to the Software Related to Concrete Pavements
- Development of Non-Proprietary Ultra-High Performance Concrete (UHPC) for Iowa Bridges
- Evaluation of the Performance of a Short-Span T-Beam Bridge
- Fatigue Evaluation of Reinforced and Unreinforced Hand Holes in High-Mast Lighting Towers
- Development of an Improved Protocol for Structural Evaluation of Dowel Load Transfer Systems for Concrete Pavements
- Validation of Gyratory Mix Design in Iowa – Phase II
- Optimal RWIS Sensor Density and Location – Phase III: Continuous Mapping of Winter Road Surface Conditions via Big Data and Deep Learning

APRIL–JUNE

- Development of Iowa Pavement Analysis Techniques (IPAT)
- Lateral Slide of Multi-Span Bridges: Investigation of Connections and Other Details – Phase I
- Guidance on Use of Channelization for Two-Lane Two-Way Work Zone Configurations
- Developing an Architecture to Integrate Safety, Mobility, and Traffic Data
- Evaluation and Preparation for Future Work Zone Safety Workshops
- Using Smart Work Zone Trailer Data to Evaluate and Predict Lane Closure Impacts with a Consideration of Work Intensity
- Economic Impacts of Atmospheric Rivers in the Transportation Sector: Methodology and Case Studies
- Speed Feedback Sign Loan Program
- Impacts of Internally Cured Concrete Paving on Contraction Joint Spacing – Phase II: Field
- Implementation of Internally Cured Concrete for Iowa Pavement Systems
- Implementation of the Negative Moment Reinforcing Detail Recommendations
- Development of Bio-Based Polymers for Use in Asphalt – Phase II
- Use of Cold Gas Dynamic Spraying for Repair of Steel Structures
- Determination of the Forces in X-Frames in Curved Girder Bridges
- Implementation of Low-Temperature Cracking Criteria in Iowa
- Investigation on Pavement ME Design Reflective Cracking, Faulting, IRI Prediction Models, Concrete Overlays Design Tool, and Performance Threshold Levels for Iowa Pavement Systems

JANUARY–MARCH

- Work Zone Data Management Applications and Opportunities
- Design and Detailing Requirements for Columns under Collision
- Asset Management, Extreme Weather, and Proxy Indicators
- Traffic Sign Life Expectancy
- Improving the Foundation Layers for Concrete Pavements: Lessons Learned and a Framework for Mechanistic Assessment of Pavement Foundations
- Exploration of Ultrasound for the Evaluation and Preservation of Structures

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TECHNICAL
REPORTS

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TECH TRANSFER
SUMMARIES

JOURNAL ARTICLES, GUIDES, AND OTHER TECHNICAL REPORTS

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Cavalline, T., Snyder, M., Cackler, T., and Taylor, P. C. 2021. Guidance for Increasing the Use of Recycled Concrete Pavement Materials. *Proc., 12th International Conference on Concrete Pavements (12th ICCP) (Virtual)*, September 27–October 1.

Ceylan, H. 2021. Construction and Performance of Using Sustainable and Renewable Materials for Road Foundation Stabilization. Presented at Workshop of Performance of Stabilized Pavement Foundations with Conventional and Unconventional Stabilizers at the Transportation Research Board 100th Annual Meeting (Virtual), January 21–22 & January 25–29.

Ceylan, H. 2021. Why Freeze-Thaw Cycles are Important in Northern Climates? Presented at Workshop of Climatic Impacts on Performance of Road Foundation at the Transportation Research Board 100th Annual Meeting (Virtual), January 21–22 & January 25–29.

Ceylan, H. 2021. FAA PEGASAS COE Project 1: Heated Airport Pavements. Presented at FAA PEGASAS COE 9th Annual Meeting (Virtual), August 5–6.

Ceylan, H. et al. 2021. Use of Concrete Grinding Residue in Pavement Shoulder Stabilization. Presented at the 2021 International Grooving & Grinding Association (IGGA) Annual Meeting, November 30.

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Ceylan, H. et al. 2021. Changes in Freeze Thaw Cycles and Trends in Minnesota. Presented at the 2021 CTS Transportation Research Conference (Virtual), November 4.

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Cheng, Z., Sritharan, S., and Ashlock, J. C. 2021. Behavior of a Bridge Pile Foundation under Combined Vertical and Lateral Loads. Presented at Technical Session on Exploiting SSI Effects in Structural Design of Bridges, ACI Virtual Spring Convention, March 29, Rosemont, IL.

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Cochran, E., Williams, R. C., Kuehl, B., Hohmann, A., and Forrester, M. 2021. Highly Compostable High Oleic Soy-Based Impact-Modifiers via Reactive Extrusion with Polyesters. *Proc., 261st Meeting of the American Chemical Society*, April 2021.

Cochran, E., Williams, R. C., and Sjogren, D. 2021. Putting Soy-Based Thermoplastics to Work in the Construction Industry. *Proc., 261st Meeting of the American Chemical Society (Virtual)*, April 2021.

Dahlberg, J. 2021. Orthotropic Steel Deck Design Guide Update. Presented at SSSBA (Short-Span Steel Bridge Alliance) Innovation Council, January 14.

Dahlberg, J. 2021. Orthotropic Steel Deck Design Guide Update. Presented at AASHTO/NSBA TG16 Meeting, April 1.

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Dahlberg, J. 2021. Field Assessment of Performance and Serviceability of Stress-Laminated Deck Superstructure Timber Bridges. Presented at the 2021 World Conference on Timber Engineering, August 9, Santiago, Chile.

Day, C. M. 2021. Impact of Vehicle Position Sensing Range on Effectiveness of Real-Time Adaptive Control. Presented at National Travel Monitoring Exposition and Conference (Virtual).

Presentations and proceedings continued on page 28

- Day, C. M., and Niloy, M. T. A. 2021.** Influence of Data Aggregation Processes on the Estimation of Travel Time Distributions from Probe Vehicle Data for Assessing Travel Time Reliability. *Proc., Transportation Research Board 100th Annual Meeting (Virtual)*, January 21–22 & January 25–29.
- Dikshit, S., and Alipour, A. 2021.** Fragility Analysis Framework for Transmission Tower Systems Subjected to Straight Line Winds. *Presented at 6th American Association for Wind Engineering Workshop (Virtual)*, May 12–14, Clemson University, Clemson, SC.
- Dodson, J., Downey, A., Laflamme, S., Todd, M., Moura, A., Wang, Y., Mao, Z., Avitabile, P., and Blasch, E. 2021.** High-Rate Structural Health Monitoring and Prognostic: An Overview. *Proc., IMAC XXXIX (39th): A Conference and Exposition on Structural Dynamics*, February 8–11, Orlando, FL.
- Dong, J. 2021.** An Artificial Neural Network-Based Model for Real-Time Dispatching of Electric Autonomous Taxis. *Presented at CEE Seminar Series*, February 12, University of California Irvine, Irvine, CA.
- Dong J., Zhang, L., and Yang, Y. 2021.** Iowa DOT Office of Maintenance Snowplow Optimization. *Presented at the Transportation Research Board 100th Annual Meeting (Virtual)*, January 21–22 & January 25–29.
- Dong, Y., and Wood, J. S. 2021.** Evaluation of Crash Contributing Factors. *Presented at ISU CCEE 150th Celebration Research Symposium*, September 17, Ames, IA.
- Farhangdoust, S., Georgeson, G., Ihn, J.-B., Aghaei, S. M., and Laflamme, S. 2021.** Bio-Inspired Metasurface Skin to Enhance the Performance of Blue Energy Harvesting. *Proc., SPIE Smart Structures and NDE 2021 (Virtual)*, March 22–26, Long Beach, CA.
- Faytarouni, M., Micheli, L., Shen, J., Seker, O., and Akbas, B. 2021.** Seismic Column Splice Demands in Braced Frames with Buckling Controlled Braces. *Proc., 11th International Structural Engineering and Construction Conference*, July 2021, Cairo, Egypt.
- Genc, D., Ashlock, J. C., Cetin, B., Cetin, K., and Horton, R. 2021.** Predicting Soil Temperature and Moisture beneath Granular-Surfaced Roadways Using Regional Weather Data Network. *Proc., IFCEE: International Foundations Congress and Equipment Expo*, May 10–14, Dallas, TX.
- Genc, D., Ashlock, J. C., Cetin, B., Cetin, K., Mahedi, M., and Horton, R. 2021.** Comparisons of Soil Temperatures and Volumetric Water Contents between the Center and Shoulder Locations of Granular Roadways. *Proc., Transportation Research Board 100th Annual Meeting (Virtual)*, January 21–22 & January 25–29.
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- Grove, J. Praul, M., Gudimettla, J., Conway, R., and Taylor, P. 2021.** A Users Guide to Performance-Engineered Mixtures. *Proc., 12th International Conference on Concrete Pavements (12th ICCP) (Virtual)*, September 27–October 1.
- Hallmark, S. 2021.** Countermeasures to Address Speed and Safety in Work Zones. *Presented at 2021 National Work Zone Management Conference (Virtual)*, March 16–18.
- Hallmark, S. 2021.** COVID-19 Impacts on Speed and Safety in Minnesota. *Presented to Lane County Oregon Fatal Crash Investigation Team*, October 2021, Lane County, OR.
- Hallmark, S. 2021.** Transverse Rumble Strips at Rural Intersections. *Presented to Oregon Transportation Safety Action Plan/Towards Zero Death Committee*, October 2021, Lane County, OR.
- Hallmark, S., Hawkins, N., Thapa, R., and Knickerbocker, S. 2021.** Intersection Scanning Behavior Due to Intersection Collision Warning Systems. *Proc., Road Safety and Simulation Conference*, September 2021, Athens, Greece.
- Hans, Z. 2021.** U.S. Road Assessment Program (usRAP) Overview: A Proactive Approach to Data-Driven Safety Analysis and Planning. *Presented at Alabama Road Safety Conference*, October 26–28, Florence, AL.
- Hans, Z., et al. 2021.** TRB Workshop 1017–Strategic Planning for Critical and Emerging Issues in Technology and Data. *Presented at Transportation Research Board 100th Annual Meeting (Virtual)*, January 21–22 & January 25–29.
- Hareendran, S. P., Alipour, A., Shafei, B., and Sarkar, P. P. 2021.** Performance-Based Wind Design of Tall Buildings Considering the Nonlinearity in Building Response. *Presented at 6th American Association for Wind Engineering Workshop (Virtual)*, May 12–14, Clemson University, Clemson, SC.
- Hawkins, N. 2021.** Iowa DOT/CTRE Connected Vehicle Research Update. *Presented at Annual MAASTO CAV e-Summit*, October 2021.
- Hawkins, N. 2021.** Working Toward Zero Deaths Using Big Data and Research. *Presented at 2021 Minnesota Towards Zero Death Conference (Virtual)*, November 10.
- Hawkins, N. 2021.** MnDOT COVID Traffic Analysis Study. *Presented at Control in Transportation (CTS) Transportation Research Conference (Virtual)*, November 2021.
- Hawkins, N., Hallmark, S., Knickerbocker, S., and Litteral, T. 2021.** COVID-19 Impacts on Speed and Safety in Minnesota. *Presented at 2021 CTS Transportation Research Conference (Virtual)*, November 4, Center for Transportation Studies, University of Minnesota, Minneapolis, MN.
- Hawkins, N., Hallmark, S., Knickerbocker, S., and Litteral, T. 2021.** COVID-19 Impacts on Speed and Safety in Minnesota. *Presented at 2021 Minnesota Towards Zero Death Conference (Virtual)*, November 10.
- Karim, R., and Shafei, B. 2021.** Development of ABC UTC non-proprietary UHPC Using Iowa Materials. *Proc., Accelerated Bridge Construction Conference*, December 8–10, Miami, FL.
- Kaya, O., Gopiseti, L. S. P., Ceylan, H., Kim, S., and Cetin, B. 2021.** Iowa Experience on Local Calibration of AASHTOWare Pavement ME Design (PMED) for Jointed Plain Concrete Pavements. *Proc., 12th International Conference on Concrete Pavements (12th ICCP) (Virtual)*, September 27–October 1.
- Khalilzadeh, Z., Okaidjah, D., and Day, C. M. 2021.** Impacts of Phase Assignment on the Operational Performance of Traffic Signals, Paper No. 21-04225. *Proc., Transportation Research Board 100th Annual Meeting (Virtual)*, January 21–22 & January 25–29.
- King, D., Gross, J., Ceylan, H., Chen, Y.-A., and Taylor, P. C. 2021.** Optimized Joint Spacing for Concrete Overlays with and without Structural Fiber Reinforcement. *Proc., 12th International Conference on Concrete Pavements (12th ICCP) (Virtual)*, September 27–October 1.
- Knickerbocker, S., Nlenanya, I., Hans, Z., and Smadi, O. 2021.** All Road Network of Linear Referenced Data (ARNOLD) Reduced Dataset. *Presented at FHWA STAC Reduced Datasets Webinar Series (Virtual)*, February 17.
- Koh, Y., Ceylan, H., Kim, S., and Cho, I. H. 2021.** Mechanistic Analysis of Superheavy Loads on Flexible Pavement Structures. *Presented at Transportation Research Board 100th Annual Meeting (Virtual)*, January 21–22 & January 25–29.
- Laflamme, S. 2021.** Field Deployable Textured Sensing Skin for Monitoring of Surface Strain. *Presented at University of Massachusetts Lowell Webinar*, Department of Civil & Environmental Engineering, April 19, Lowell, MA.
- Lamba, K., Ashlock, J. C., Cetin, B., and Hasiuk, F. 2021.** Evaluation of Mechanical Degradation and Change in Geotechnical Shear Strength Parameters of Coarse Aggregates under Traffic Loading. *Proc., FCEE: International Foundations Congress and Equipment Expo*, May 10–14, Dallas, TX.
- LaPatin, M., Verses, L., Poleacovschi, C., Padgett-Walsh, K., Feinstein, S., Rutherford, C., Nguyen, L., and Faust, K. 2021.** What Role Do Civil Engineering Students See for Their Profession in the COVID-19 Response. *Proc., American Society for Engineering Education (ASEE) (Virtual)*, April 17.
- Laquidara-Carr, D., Wilkinson, C., Farhat, J., Sturgill, R., and Cox, S. 2021.** The Emerging Value of Remote-Virtual Inspections for Civil Construction. *Presented at Construction-On Demand Webinar*, March 15, Dodge Data & Analytics.
- Li, W., Wang, K., Dong, W., and Shah, S. 2021.** Development of Cement-Based Sensors Using Conductive Rubber and Carbon Black. *Presented at ACI Convention Technical Session of Smart Concrete*, March 31.
- Liu, H., Laflamme, S., Li, J., Bennett, C., Collin, W., Jo, H., and Downey, A. 2021.** Experimental Validation of Textured Sensing Skin for Fatigue Crack Monitoring. *Proc., SPIE Smart Structures and NDE 2021 (Virtual)*, March 22–26, Long Beach, CA.
- Liu, H., Laflamme, S., Zellner, E., Bentil, S., Rivero, I., Secord, T., and Tamayol, A. 2021.** Corrugated Compliant Capacitor Towards Smart Bandage Application. *Proc., International Instrumentation and Measurement Technology Conference*, May 17–20, Glasgow, Scotland.
- Lu, H., Barzegar, V., Nemani, V., Hu, C., Laflamme, S., and Zimmerman, A. 2021.** GAN-Based LSTM Predictor for Failure Prognostics of Rolling Element Bearings. *Proc., International Conference on Prognostics and Health Management*, June 7–9, Detroit, MI.
- Mahedi, M., Ashlock, J. C., Cetin, B., Cetin, K., Genc, D., Horton, R., and Ceylan, H. 2021.** Evaluation of Soil Thermal and Hydraulic Properties at Unsaturated Conditions for Frost Depth Prediction. *Proc., 4th International Conference on Transportation Geotechnics (ICTG)*, May 23–26, Chicago, IL.

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Nguyen, L. M., LaPatin, M., Poleacovschi, C., Faust, K., Padgett-Walsh, K., Feinstein, S., and Rutherford, C. 2021. Investigating On-Campus Engineering Student Organizations as Means of Promoting Ethical Development. *Proc., American Society for Engineering Education (ASEE) (Virtual)*, April 17.

Planche, J. P., Boysen, R., Chailleux, E., Pouget, S., Porot, L., Williams, R. C., Cochran, E., and Lo Presti, D. 2021. Innovations in Analysis of Rejuvenators in Blends Using RAP as Part of Infravation Projects. *Proc., 7th Euraspalt & Eurobitume Congress—Asphalt 4.0 for Future Mobility (Virtual)*, Madrid, Spain, June 16–18.

Podolsky, J., Staver, M., Williams, R. C., Hohmann, A., Hernandez, N., and Cochran, E. 2021. Performance Evaluation of Asphalt Binders and RAP-Incorporated Mixtures Engineered with Bio-Renewable Modifiers: An Ongoing Adventure in the Midwest. *Proc. Transportation Research Board 100th Annual Meeting (Virtual)*, January 21–22 & January 25–29.

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Puglis, H. J., Jackson, P., and Rehmann, C. 2021. Toxicity of Wildland Fire-Fighting Chemicals in Pulsed Exposures. *Presented at Society of Environmental Toxicology and Chemistry (SETAC) North America 42nd Annual Meeting (Virtual)*, November 14–18.

Sadati, S., Wang, X., Taylor, P. C., Kevern, J., and Wang, K. 2021. Air Void System Requirements for Durable Paving Concrete—Another Look. *Proc., 12th International Conference on Concrete Pavements (12th ICCP) (Virtual)*, September 27–October 1.

Saini, D., and Shafei, B. 2021. A Novel Design Procedure for CFRP-Strengthened Concrete-Filled Steel Tubes to Resist Lateral Impact Loads. *Proc., 10th International Conference on FRP Composites in Civil Engineering*, December 8–10, Istanbul, Turkey.

Satvati, S., Cetin, B., and Ashlock, J. C. Evaluation of Optimized Compaction Energy for Coarse Aggregates by Gyrotory Compactor. *Proc., FCEE: International Foundations Congress and Equipment Expo*, May 10–14, Dallas, TX.

Schaefer, V. R. 2021. Mentoring, Work-Life Balance & Related Issues. *Presented at Center for Bio-mediated & Bio-inspired Geotechnics Mid-Year Meeting (Virtual)*, April 13.

Schaefer, V. R. 2021. State of the Practice Lecture: Ground Improvement in the 21st Century. *Presented at 23rd Annual George F. Sowers Symposium (Virtual)*, September 21, Georgia Institute of Technology, Atlanta, GA.

Schaefer, V. R. 2021. GeoTechTools: The First Place to Look. *Presented at Geo-Institute Lunch & Learn (Virtual)*, December 8.

Shams, A., and Day, C. M. 2021. Impact of Sensing Range on Real-Time Adaptive Control of Signalized Intersections Using Vehicle Trajectory Information. *Proc., Transportation Research Board Annual Meeting (Virtual)*, January 21–22 & January 25–29.

Sharma, A. 2021. Milkweed Plant Detection Using Mobile Cameras. *Presented at Research Roundtable: Webinar 3 | Monarchs & Milkweed*, University of Illinois, Champaign, IL.

Sharma, A. 2021. Is Any Picture Worth a Thousand Words: Using Graphs for Creating a Narrative. *Presented at Traffic Signal System Mid-Year Meeting*.

Sharma, A. 2021. Borrowing DAGger from Imitation Learning for Efficient Training of Deep Models on Naturalistic Driving Data. *Presented at Naturalistic Driving Data Analytics at IEEE Intelligent Vehicle Symposium - IV 2021*.

Sharma, A. 2021. Automating Wrong Way Detection Using Existing CCTV Cameras. *Presented at ASCE International Conference on Transportation and Development (ICTD21)*.

Sharma, A. 2021. Achieving Level 4 Autonomy in Signal Retiming. *Presented at SPARC Workshop on Advanced Techniques for Mobility and Congestion Analysis for Indian Cities*, March 26.

Sharma, A. 2021. To Train or Not to Train in Artificial Intelligence in Signal Timing Applications. *Presented at Transportation Research Board 100th Annual Meeting (Virtual)*, January 21–22 & January 25–29.

Sharma, A. 2021. Level 4 Signal Autonomy. *Presented at Technology and Standards Subcommittee Meeting at Transportation Research Board 100th Annual Meeting (Virtual)*, January 21–22 & January 25–29.

Sharma, A., and Haghighat, A. K. 2021. Application of Distributed Learning in Transportation Engineering. *Presented at CVPR 2021 Workshop on Distributed Deep Learning on HPC Servers for Large Scale Computer Vision Applications*.

Sisman, O., Seker, Akbas, B. O., Faytarouni, M., and Shen, J. 2021. Seismic Performance of Special Concentrically Braced Frames Designed According to Turkish Seismic Codes 2007 and 2018. *Proc., 9th Turkish Conference on Earthquake Engineering*, June 2–3, Istanbul, Turkey.

Smith, G. 2021. *Presented at the North Dakota Department of Transportation's Concrete Inspector's Virtual Workshop*, February 23–24, North Dakota Department of Transportation.

Smith, G. 2021. Concrete Overlays. *Presented at the 2021 Oklahoma Concrete Pavement Conference*, June 1–2, American Concrete Pavement Association.

Smith, G. 2021. Performance-Engineered Mixtures (PEM) Workshop. *Presented at the Tennessee Department of Transportation*, August 23.

Smith, G. 2021. Performance-Engineered Mixtures (PEM). *Presented to Cemen Tech*, September 23, Indianola, IA.

Smith, G. 2021. Overlay Overview. *Presented at Overlay Summit (CP Tech Center)*, October 27–28, American Concrete Pavement Association Headquarters, Rosemont, IL.

Smith, G. 2021. Performance-Engineering Mixtures (PEM)—The Tech That Makes It Happen. *Presented at American Concrete Pavement Association Annual Meeting*, December 2, Huntington Beach, CA.

Smith, G. 2021. Delivering Better Concrete Pavements with Performance-Engineered Mixtures (PEM). *Presented to the Associated General Contractors (AGC) of Missouri*, December 9.

Smith, G., VanDam, T., King, D., Jones, C., Cavalline, T., Praul, M., Gudimetla, J., and Taylor, P. C. 2021. Performance-Engineered Mixtures Workshop. *Proc., 12th International Conference on Concrete Pavements (12th ICCP) (Virtual)*, September 27–October 1.

Sturgill, R., and Al-Bayati, A. 2021. Utility Coordination within Design-Build Projects. *Presented at Webinar within ECE5213 Principles of Design-Build*, November 3, Lawrence Technological University.

Taylor, P. 2021. *Presented at the Michigan Concrete Association Winter Conference (Virtual)*, February 17, Michigan Concrete Association.

Taylor, P. 2021. *Presented to the Pennsylvania Aggregates and Concrete Association (Virtual)*, February 17.

Taylor, P. 2021. Concrete Paving Field Inspection. *Presented at the North Dakota Department of Transportation's Concrete Inspector's Virtual Workshop*, February 23–24, North Dakota Department of Transportation.

Taylor, P. 2021. *Presented to the "Design of Concrete" CE382 Course (Virtual)*, February 25, Department of Civil, Construction, and Environmental Engineering, Iowa State University.

Taylor, P. 2021. Evolution of Durability for Concrete Pavements. *Presented at the American Concrete Institute Virtual Concrete Convention*, April 1, American Concrete Institute.

Taylor, P. 2021. Bridge Deck Crack Control. *Presented to the Utah Department of Transportation (Virtual)*, April 22.

Taylor, P. 2021. Concrete Mixture Proportions. *Presented at a Concrete Pavement and Materials Technical Feedback Group (TFG) Virtual Meeting*, May 25, Federal Highway Administration.

Taylor, P. 2021. Concrete Pavement Inspection: Avoiding Pitfalls. *Presented to the North Carolina Department of Transportation (Virtual)*, May 26.

- Taylor, P. 2021.** Slag Contents for Pavements. *Presented to the Illinois Ready Mixed Concrete Association (Virtual)*, June 3.
- Taylor, P. 2021.** Properties of Concrete Mixtures for Long-Term Performance. *Presented at the American Concrete Pavement Association Research, Technology, and Innovation (RT&I) Committee Meeting (Virtual)*, September 10, American Concrete Pavement Association.
- Taylor, P. 2021.** Lifecycle Cost Analysis of Internally Cured Jointed Plain Concrete Pavement. *Proc., 12th International Conference on Concrete Pavements (12th ICCP) (Virtual)*, September 27–October 1.
- Taylor, P. 2021.** Machine vs. Concrete: Building Long-Lasting Concrete Pavements. *Presented at the Concrete Pavement Technology Tuesday Webinar (Virtual)*, October 12, National Concrete Pavement Technology Center, Institute for Transportation, Iowa State University.
- Taylor, P. 2021.** Role of Materials in Sustainable Pavement Construction. *Presented at the American Concrete Institute Virtual Concrete Convention (Virtual)*, October 20, American Concrete Institute.
- Taylor, P. 2021.** Innovations in Concrete Pavements. *Presented to Concrete Ontario (Virtual)*, October 21.
- Taylor, P. 2021.** Entrained Air-Void Systems for Durable Highway Concrete. *Presented at a Transportation Research Board Webinar (Virtual)*, October 26.
- Taylor, P. 2021.** Performance-Engineered Mixtures: Not Just an American Gimmick. *Presented at ConcreteFix (Virtual)*, September 21, Cement and Concrete South Africa.
- Taylor, P., and Amini, K. 2021.** An Overview of Salt-Scaling Damage. *Presented at an American Concrete Institute Webinar (Virtual)*, March 2, American Concrete Institute.
- Taylor, P., and Fick, G. 2021.** Concrete Overlays: A Proven Technology. *Presented at a Pennsylvania Department of Transportation Concrete Overlays Webinar (Virtual)*, May 18, Pennsylvania Department of Transportation.
- Taylor, P., and Ling, Y. 2021.** Effects of Vibration on Concrete Mixtures. *Presented at the Australian Society for Concrete Pavements' Annual Conference (Virtual)*, August 17, Australian Society for Concrete Pavements.
- Taylor, P., and Praul, M. 2021.** Advancements in Performance-Engineered Mixtures (PEMs). *Presented at the Concrete Pavement Technology Tuesday Webinar (Virtual)*, September 14, National Concrete Pavement Technology Center, Institute for Transportation, Iowa State University.
- Taylor, P., and Smith, G. 2021.** Concrete Mixture Performance Monitoring. *Presented at the Utah Concrete Paving Workshop: Moving the Economy (Virtual)*, January 27, Utah Ready Mixed Concrete Association.
- Taylor, P., Smith, G., and Gross, J. 2021.** Performance-Engineered Concrete Mixtures for Pavements. *Presented to the Arkansas Department of Transportation (Virtual)*, July 27.
- Tian, K., Yang, B., King, D., Ceylan, H., and Kim, S. 2021.** Characterization of Curling and Warping Influence on Smoothness of Jointed Plain Concrete Pavements. *Proc., ASCE International Airfield and Highway Pavements Conference (Virtual)*, June 8–10, pp. 110–119.
- Torti, M., Sacconi, S., Ierimonti, L., Venanzi, I., Laflamme, S., and Ubertini, F. 2021.** The Use of WIM Systems for Reducing Uncertainties in Fatigue Reliability Assessment of Roadway Bridges: A Life-Cycle Cost Perspective. *Proc., 10th International Conference on Structural Health Monitoring of Intelligent Infrastructure (SHMII-10) (Virtual)*, June 30–July 2, Porto, Portugal.
- Torti, M., Venanzi, I., Laflamme, S., and Ubertini, F. 2021.** Use of Weigh-in-Motion Systems for Reducing Uncertainties in Fatigue Reliability Assessment of Roadway Bridges: A Life Cycle Cost Perspective. *Proc., 10th International Conference on Structural Health Monitoring of Intelligent Infrastructure (SHMII-10) (Virtual)*, June 30–July 2, Porto, Portugal.
- Trinidad-Gonzalez, Y., and Schaefer, V. R. 2021.** Case History-Based Comparative Analysis of Coupled and Uncoupled Approaches for Pile-Reinforced Slopes. *Proc., International Foundations Congress & Equipment Expo*, May 10–14, Dallas, TX.
- Trinidad-Gonzalez, Y., Schaefer, V. R., and Rollins, D. K. 2021.** Applications of Statistical Design of Experiments to Study the Factor of Safety of Unreinforced Slopes. *Proc., International Foundations Congress & Equipment Expo*, May 10–14, Dallas, TX.
- Trinidad-Gonzalez, Y., Schaefer, V. R., and Rollins, D. K. 2021.** Factors Controlling the Fully Softened Shear Strength: A Statistical Assessment. *Proc., International Foundations Congress & Equipment Expo*, May 10–14, Dallas, TX.
- Tsai, L., and Alipour, A. 2021.** Fatigue Life and Reliability Estimation of a Traffic Signal Structure Using Long-Term Monitoring Data. *Presented at 6th American Association for Wind Engineering Workshop (Virtual)*, May 12–14, Clemson University, Clemson, SC.
- Veneziano, D. 2021.** In-Service Sign Retroreflectivity Performance. *Presented at Missouri, Iowa, Nebraska, Kansas (MINK) Local Roads Meeting*, September 23, St. Joseph, MO.
- Venkatachalapathy, A., Raj, A., Sharma, A., and Merickel, J. 2021.** Implementing a Comprehensive Cloud-Based Platform for Naturalistic Driving Studies. *Proc., FAST-zero 2021: International Symposium on Future Active Safety Technology Toward Zero Traffic Accidents*, September 28–30, Kanazawa, Japan.
- Venkatachalapathy, A., Sharma, A., and Devi, L. 2021.** A Naturalistic Data-Driven Study of Indian Traffic Conditions and Driver's Physiological Stress. *Proc., 6th Conference of the Transportation Research Group of India (CTRG2021)*, December 14–17, Tiruchirappalli (Trichy), Tamil Nadu, India.
- Vereen, A., Downey, A., Sockalingam, S., and Laflamme, S. 2021.** State-Based Impact Damage Quantification Using Large-Area Capacitive Sensors. *Proc., QNDE 2021: 48th Annual Review of Progress in Quantitative Nondestructive Evaluation (Virtual)*, July 28–30.
- Vereen, A., Downey, A., Sockalingam, S., Ziehl, P., Laflamme, S., Li, J., Jo, H., and Downey, A. 2021.** Monitoring Impact Damage in Composites with Large Area Sensing Skin. *Proc., SPIE Smart Structures and NDE 2021 (Virtual)*, March 22–26, Long Beach, CA.
- Villwock-Witte, N., Veneziano, D., Clouser, K., and Fay, L. 2021.** Diving Down the Rabbit Hole: RWIS Data to Develop a SWI. *Proc., Transportation Research Board 100th Annual Meeting (Virtual)*, January 21–22 & January 25–29.
- Vosoughi, P., Taylor, P. C., and Horton, R. 2021.** Pore Water Potential Development in Cement-Based Materials. *Proc., 12th International Conference on Concrete Pavements (12th ICCP) (Virtual)*, September 27–October 1.
- Wang, K., Shah, S., Voigt, T., Pekmezci, B., and Lomboy, G. 2021.** Optimal Balance between Consolidating Ability and Green Strength of Semi-flowable Self-consolidating Concrete. *Presented at ACI Convention Technical Session of "Is SCC Consolidating Free," April 1.*
- White, D. J., and Taylor, P. 2021.** In-Situ Cyclic Loading of Concrete Pavement Overlays Supported on Geotextile and Asphalt Interlayers. *Spring 2021 National Concrete Consortium (Virtual)*, April 13–15, National Concrete Consortium.
- Xue, Z., Ashlock, J. C., Cetin, B., Wu, Y., Li, C., and Ceylan, H. 2021.** Freeze-Thaw Performance of Granular Roads Stabilized with Optimized Gradation and Clay Slurry. *Proc., 4th International Conference on Transportation Geotechnics (ICTG)*, May 23–26, Chicago, IL.
- Yang, B., Zhang, Y., Ceylan, H., and Kim, S. 2021.** Field Evaluation of Using Slag as Aggregates for Otta Seal. *Proc., 4th International Conference on Transportation Geotechnics (ICTG)*, May 23–26, Chicago, IL.
- Zhang, H., Guan, Y., Kamal, A., Qiao, D., Zheng, M., Arora, A., Boyraz, O., Cox, B., Daniels, T., Darr, M., Jacobson, D., Khokhar, A., Kim, S., Koltas, J., Liu, J., Luby, M., Nadolny, L., Peschel, J., Schnable, P., Sharma, A., Somani, A., and Tang, L. 2021.** ARA: A Wireless Living Lab Vision for Smart and Connected. *Proc., WiNTECH 2021: International Workshop on Wireless Network Testbeds, Experimental Evaluation & Characterization*, October 25, New Orleans, LA.
- Zheng, G., Alimohammadi, H., Zheng, J., and Schaefer, V. R. 2021.** Effectiveness of Geosynthetics in the Construction of Roadways: A Full-Scale Field Studies Review. *Proc., International Foundations Congress & Equipment Expo*, May 10–14, Dallas, TX. ■

COMMITTEE INVOLVEMENT AND SERVICE TO THE PROFESSION

John Adam, Associate Director, CP Tech Center

- Friend, TRB Concrete Pavement Construction and Rehabilitation Committee (AKC50)
- Friend, TRB Pavement Preservation Committee (AKT20)
- Friend, TRB Design and Rehabilitation of Concrete Pavements Committee (AKP20)
- Team Member and Subject Matter Expert (SME), FHWA Every Day Counts Sixth Round (EDC-6) Innovation Targeted Overlay Pavement Solutions Implementation
- Member, ACPA Quality Construction Committee
- Presenter, FHWA Concrete Pavement and Materials Technical Feedback Group (CPM TFG)

Paul Albritton, Technical Training Coordinator, Iowa LTAP

- Member, National Local Technical Assistance Program Association (NLTAPA) Professional Development Workgroup
- Authorized Instructor, Occupational Safety and Health Administration (OSHA) Outreach
- Instructor, Iowa 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 and Conference; and ICEA Annual Conference

Alice Alipour, Structure and Infrastructure Engineer, BEC

- Associate Editor, *ASCE Journal of Bridge Engineering*
- Member, ASCE Engineering Mechanics Institute (EMI)'s Objective Resilience Committee
- Paper Coordinator and Leadership Team, TRB Critical Transportation Infrastructure Protection Committee (ABR10)

Jeremy Ashlock, Faculty Affiliate

- Member-at-Large, ASTM International D18 Main Committee
- Chair, ASTM International D18.09 Cyclic and Dynamic Properties of Soils Subcommittee
- Member, ASTM International D18.02 Sampling and Related Field Testing for Soil Evaluation Subcommittee
- Member, Earthquake Engineering Research Institute (EERI)
- Member, American Geophysical Union
- Member, Society of Exploration Geophysicists
- Member, ASCE Earthquake Engineering and Soil Dynamics Technical Committee
- Member, ASCE Engineering Geology and Site Characterization Technical Committee
- Member, International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)
- Member, American Society of Mechanical Engineers (ASME) Geomechanics Committee
- Member, ASCE-EMI Elasticity Committee
- Member, United States Universities Council on Geotechnical Education and Research (USUCGER)
- Member, Deep Foundations Institute (DFI)
- Member, Pile Driving Contractors Association (PDCA)
- Associate Member, ASCE Geo-Institute (G-I) and EMI
- Technical Affiliate, Association of Drilled Shaft Contractors (ADSC)
- Reviewer, *ASCE Journal of Geotechnical and Geoenvironmental Engineering*

Ashley Buss, Faculty Affiliate

- Member, TRB Non-Binder Components of Asphalt Mixtures Committee (AKM30 [Formerly AFK 30])
- Member, TRB Quality Assurance Management Committee (AKC30 [Formerly AFH20])
- Member, TRB Design and Rehabilitation of Asphalt Pavements Committee (AFD60)
- Editorial Board Member and Reviewer, *Road Materials and Pavement Design*
- Editorial Board Member and Reviewer, *Journal of the Association of Asphalt Paving Technologists*
- Reviewer, *Transportation Research Record*
- Reviewer, *Construction and Building Materials*
- Reviewer, *ASCE Journal of Materials in Civil Engineering*
- Reviewer, *International Journal of Pavement Engineering*
- Reviewer, *ASTM Journal of Testing and Evaluation*
- Reviewer, *Transportation in Developing Economies*
- Reviewer, *Transportation Infrastructure Geotechnology*
- Reviewer, *International Journal of Pavement Research and Technology*

Halil Ceylan, Director, PROSPER

- Member, American Concrete Institute (ACI) Concrete Pavements Committee (ACI 325)
- Chair, ASCE G-I Pavements Committee
- Member, ASCE G-I Awards Subcommittee
- 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 Long-Term Pavement Performance (LTPP) Data Analysis Subcommittee
- Member, TRB Advanced Concrete Pavement Modeling Subcommittee (AFD50(1))
- Member, TRB Mechanistic Characterization of Pavement Layers Subcommittee (AFD80(1))
- Member, TRB Interlayer Systems to Control Reflective Cracking Subcommittee (AFD70(1))
- Friend, TRB Pavement Monitoring and Evaluation Committee (AFD20)
- Friend, TRB Pavement Rehabilitation Committee (AFD70)
- Friend, TRB Mineral Aggregates Committee (A2J03)
- Member, USUCGER
- Member, International Society for Maintenance and Rehabilitation of Transportation Infrastructures (ISMARTI)
- Member, American Association for the Advancement of Science (AAAS)
- Member, Falling Weight Deflectometer Users Group
- Member, Turkish-American Scientists and Scholars Association (TASSA)
- Member, Turkish Chamber of Civil Engineers (TCEC)
- Member, International Society for Concrete Pavements
- Member, US Technical Committee for the 4th International Conference on Transportation Geotechnics (ICTG)
- Chair, 4th ICTG session on Optimized and Recycled Geomaterials
- Organizer, 4th ICTG workshop on Sustainability and Climatic Effects in Mechanistic Based Designs of Road Infrastructure Systems
- Associate Editor, *ASCE Journal of Transportation Engineering, Part B: Pavements*
- Topic Editor-in-Chief, *World Journal of Engineering and Technology*

- Associate Editor, *International Journal of Pavement Research and Technology*
- Editorial Board Member/Editor/Assessor, *Proceedings of the Institution of Civil Engineers (ICE): Construction Materials*
- Editorial Board Member/Editor, *Journal of Data Analysis and Information Processing*
- Editorial Board Member/Editor/Assessor, *ICE Infrastructure Asset Management*
- Editorial Board Member/Editor, *International Journal of Mechanics and Solids*
- Editorial Board Member/Editor, *Baltic Journal of Road and Bridge Engineering*

In-Ho Cho, Faculty Affiliate

- Member, Finite Element Analysis of Reinforced Concrete Structures Committee (ASCE-ACI 447)
- Reviewer, *International Journal for Numerical Methods in Engineering*
- Reviewer, *Mathematical and Computer Modelling of Dynamical Systems*
- Reviewer, *ASCE Journal of Structural Engineering*
- Reviewer, *ASCE Journal of Engineering Mechanics*
- Reviewer, *EERI Earthquake Spectra*
- Reviewer, *ACI Structural Journal*
- Reviewer, *ACI Materials Journal*
- Reviewer, *Construction and Building Materials*

Christopher Day, Affiliate Researcher, CTRE

- Member, ASCE
- Member, Institute of Transportation Engineers (ITE)
- Member, Institute of Electrical and Electronics Engineers (IEEE)
- Member and Research Coordinator, TRB Traffic Signal Systems Committee (AHB25)
- Handling Editor, *Transportation Research Record*
- Associate Editor and Reviewer, *ASCE Journal of Transportation Engineering*
- Associate Editor, *Journal of Modern Mobility Systems*
- Reviewer, *Journal of Advanced Transportation*
- Reviewer, *Journal of Big Data Analytics in Transportation*
- Reviewer, *Case Studies on Transport Policy*
- Reviewer, *Institute of Engineering and Technology (IET) Intelligent Transportation Systems*
- Reviewer, *IEEE International Conference on Intelligent Transportation Systems*
- Reviewer, *IEEE Transactions on Intelligent Transportation Systems*
- Reviewer, *ITE Journal*
- Reviewer, *Transportation Research Part B: Methodological*
- Reviewer, *Transportation Research Part C: Emerging Technologies*
- Review Coordinator and Reviewer, TRB Annual Meeting
- Peer Reviewer, Portland State University proposals

Jing Dong-O'Brien, Transportation Engineer, CTRE

- Senior Member, IEEE
- Member, TRB Transportation Network Modeling Committee (AEP40)
- Member, TRB Traffic Flow Theory and Characteristics Committee (ACP50)
- Editor, *Journal of Advanced Transportation*
- Associate Editor, *IEEE Conference on Intelligent Transportation Systems*
- Panelist, NSF, Smart and Connected Communities (SCC) Program
- Ad Hoc Reviewer, NSF

Committee involvement continued on page 32

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- Reviewer, 11th International Conference on Concrete Pavements
- Reviewer, ACI 325: *Guide to Design and Proportioning of Concrete Mixtures for Pavements*
- Reviewer, *International Journal of Pavement Engineering*

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- Board of Directors, Air and Waste Management Association
- Executive Committee, Council of University Transportation Centers
- Member, ITE
- Member, TRB Ahead of the Curve Committee (ABG10(1))
- Member, TRB Traffic Control Devices Committee (ACP55)
- Member, TRB Operational Effects of Geometrics Committee (AKD10)
- Associate Editor, *IEEE International Conference on Intelligent Transportation Systems*
- Reviewer, 6th International Symposium on Highway Geometric Design
- Reviewer, *ASCE Journal of Transportation Engineering*
- Reviewer, *Journal of Safety Research*
- Reviewer, *Transportation Research Record*

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- Member, TRB Geographic Information Science Committee (AED40)
- Member, Iowa Statewide Traffic Records Coordinating Committee (STRCC)
- Member, Iowa Fatality Reduction Task Force

Neal Hawkins, Associate Director, InTrans

- Member, TRB Pavement Marking and Signing Materials Committee (AHD55)
- Friend, TRB Visibility Committee (AND40)
- Member, ITE Past Presidents Council
- Panel Member, Annual Mid America Association of Transportation Officials (MAASTO) Connected and Automated Vehicles (CAV) eSummit
- Reviewer, *ASCE Journal of Transportation Engineering*
- Reviewer, *Journal of the Transportation Research Forum*

Kaoru Ikuma, Faculty Affiliate

- Reviewer, American Chemical Society (ACS) *Environmental Science & Technology*
- Reviewer, *Water Research*
- Reviewer, *Environment International*
- Reviewer, *ASCE Journal of Materials in Civil Engineering*
- Reviewer, *Environmental Science: Water Research & Technology*
- Reviewer, *Environmental Science: Processes & Impacts*
- Reviewer, *Environmental Science: Nano*
- Reviewer, *ACS Accounts of Chemical Research*
- Reviewer, *Materials*
- Reviewer, *Royal Society of Chemistry (RSC) Advances*
- Reviewer, *ASCE Journal of Environmental Engineering*
- Reviewer, *Environmental Engineering Science*
- Reviewer, *Applied Microbiology and Biotechnology*
- Reviewer, *Biodegradation*
- Ad-Hoc Reviewer, NSF Established Program to Stimulate Competitive Research (EPSCoR)

Charles Jahren, Faculty Affiliate

- Member, ASCE
- Member, ASCE Construction Engineering Education Committee
- Member, ASCE Digital Project Delivery Committee
- Member, ASCE Construction Research Council
- Member, American Society for Engineering Education
- 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
- Chair of the Editorial Board (Emeritus Editor-in-Chief) and Reviewer, *ASCE Journal of Construction Engineering and Management*

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- Member, ASCE
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- Member, ASCE T&D
- Member, ASCE Iowa Section
- Member, AAAS
- Friend, TRB National Research Council
- Friend, TRB Advanced Concrete Materials and Characterization Committee (AKM50)
- Friend, TRB Aggregates Committee (AKM80)
- Friend, TRB Agriculture and Food Transportation Committee (AT030)
- Friend, TRB Aircraft/Airport Compatibility Committee (AV070)
- Friend, TRB Artificial Intelligence and Advanced Computing Applications Committee (AED50)
- Friend, TRB Asphalt Pavement Construction and Rehabilitation Committee (AKC60)
- Friend, TRB Concrete Pavement Construction and Rehabilitation Committee (AKC50)
- Friend, TRB Design and Rehabilitation of Asphalt Pavements Committee (AKP30)
- Friend, TRB Design and Rehabilitation of Concrete Pavements Committee (AKP20)
- Friend, TRB Durability of Concrete Committee (AFN30)
- Friend, TRB Geo-Environmental and Climatic Impacts on Geomaterials Committee (AKG30)
- Friend, TRB Low-Volume Roads Committee (AKD30)
- Friend, TRB Maintenance and Operations Management Committee (AKR10)
- Friend, TRB Mechanics and Drainage of Saturated and Unsaturated Geomaterials Committee (AKG40)
- Friend, TRB Pavement Condition Evaluation Committee (AKP10)
- Friend, TRB Pavement Maintenance Committee (AKT30)
- Friend, TRB Pavement Management Systems Committee (AKT10)
- Friend, TRB Pavement Preservation Committee (AKT20)
- Friend, TRB Pavement Structural Testing and Evaluation Committee (AKP40)
- Friend, TRB Pavement Surface Properties and Vehicle Interaction Committee (AKP50)
- Friend, TRB Properties of Concrete and Constituent Materials Committee (AKM60)
- Friend, TRB Road Weather Committee (AKR50)
- Friend, TRB Stabilization of Geomaterials and Recycled Materials Committee (AKG90)
- Friend, TRB Statistical Methods Committee (AED60)
- Friend, TRB Transportation Asset Management Committee (AJE30)
- Friend, TRB Winter Maintenance Committee (AKR40)

Dan King, Research Engineer, CP Tech Center

- Member, ACPA Design and Engineering Functional Committee
- Member, ACPA Emerging Leaders Group
- Vice President, Safety ACI Iowa State University Student Chapter
- Member, ACI Iowa Chapter

Keith Knapp, Director, Iowa LTAP

- President, NLTAPE
- Member, ITE
- Chair and Member, TRB Low-Volume Road Conference Planning Committee
- Member, TRB Safety Performance and Analysis Committee (ACS20)

Skylar Knickerbocker, Research Engineer, REACTOR

- Co-Chair, Work Zone Data Exchange (WZDX) Specification Update Subgroup of Work Zone Data Working Group
- Member, TRB Traffic Control Devices Committee (ACP55)
- Member, TRB Visualization in Transportation Committee (AED80)

Simon Laflamme, Faculty Affiliate

- Member, ASCE Structural Health Monitoring & Control Technical Committee, EMI
- Editorial Board Member and Reviewer, *ASME Journal of Nondestructive Evaluation*
- Editorial Board Member and Reviewer, *Mechanical Systems and Signal Processing*
- Editorial Board Member and Reviewer, *Research in Nondestructive Evaluation*
- Editorial Board Member and Reviewer, *Sensors*
- Editorial Board Member and Reviewer, *Measurement Science and Technology*
- Member, *Shock and Vibration* Editorial Board
- Guest Editor, *Sensors*, Smart Sensor Networks for Civil Infrastructure Monitoring
- Guest Editor, *Measurement Science and Technology*, Measurement-Based Evaluation and Decision Making in Composite Materials
- Reviewer, *Journal of Civil Structural Health Monitoring*
- Reviewer, *Materials Today*
- Reviewer, *Engineering Structures*
- Reviewer, *Computer-Aided Civil Infrastructure Engineering*
- Reviewer, *Marine Structures*
- Reviewer, *Earthquake Engineering and Structural Dynamics*
- Reviewer, *IEEE/ASME Transactions on Mechatronics*
- Reviewer, *Journal of Sensors*
- Reviewer, *ASCE Journal of Materials in Civil Engineering*
- Reviewer, *Composite Structures*
- Reviewer, *Structural Health Monitoring*
- Reviewer, *ASME Journal of Dynamic Systems, Measurement, and Control*
- Reviewer, *Proceedings of the IEEE*
- Reviewer, *IET Microwaves, Antennas & Propagation*
- Reviewer, *Electronics*
- Reviewer, *Mathematical Problems in Engineering*
- Reviewer, *Journal of Materials Science*
- Reviewer, *Structural Monitoring and Maintenance*
- Reviewer, *Structural Control and Health Monitoring*
- Reviewer, *Smart Materials and Structures*
- Reviewer, *IEEE Transactions on Neural Networks and Learning Systems*

- Reviewer, *ASCE Journal of Performance of Constructed Facilities*
- Reviewer, *ASCE Journal of Structural Engineering*
- Reviewer, *ASCE Journal of Engineering Mechanics*
- Reviewer, *ASCE Journal of Bridge Engineering*
- Reviewer, *Cement and Concrete Composites*
- Reviewer, *Journal of Sound and Vibrations*
- Reviewer, *Advances in Structural Engineering*
- Reviewer, *Asian Journal of Control*
- Reviewer, *Measurement*
- Panelist, Cyber-Physical Systems, NSF
- Invited Panelist, Sub-Second State Estimation Workshop, International Modal Analysis Conference (IMAC)

Theresa Litteral, Statewide MDST Facilitator, Iowa LTAP

- Fellow, Geological Society of London
- Member, Statewide Traffic Incident Management (TIM) Committee
- Member, Iowa Fatality Reduction Task Force
- Member, Iowa Advisory Council on Automated Transportation
- Member, Iowa STRCC
- Member, West Virginia Association of Geospatial Professionals
- Member, TRB Pedestrian and Bicycle University Education Subcommittee (ACH20)
- Member, Mining and Resource Contractors Safety and Training Association (MARCSTA)
- Member, Society of American Military Engineers

Zhengyu Liu, Research Engineer, BEC

- Reviewer, *Advances in Civil Engineering*
- Reviewer, *ASCE Journal of Bridge Engineering*
- Reviewer, *Transportation Research Record*

Katherine Madson, Faculty Affiliate, CMAT

- Track Co-Chair, ASCE Construction Research Congress 2022, Project and Organizational Management and Planning Committee
- Friend, TRB Construction Management Committee (AKC10)
- Friend, TRB Data for Decision Making Committee (AJE70)
- Friend, TRB Transportation Asset Management Committee (AJE30)
- Friend, TRB Freight Transportation Data Committee (AED70)
- Friend, TRB Disaster Response, Emergency, Evacuations, and Business Continuity Committee (AMR20)
- Reviewer, *ASCE Journal of Management in Engineering*
- Reviewer, *Engineering, Construction, and Architectural Management*
- Reviewer, *Engineering Project Organization Journal*

Hossein Naraghi, Research Scientist, CTRE

- Member, ITE
- Member, National Collegiate Athletic Association (NCAA)
- Friend, TRB Safety Data Analysis and Evaluation Committee (ANB20)
- Friend, TRB Roadway Safety Data Subcommittee (ABJ20)
- Friend, TRB Traffic Law Enforcement Committee (ANB40)

Inya Nlenanya, Research Scientist

- Member, TRB Low-Volume Roads Committee (AKD30)
- Member, 10th International Visualization In Transportation Symposium Committee
- Associate Member, ASCE
- Panel Member, NCHRP Project 17-100 Leveraging Big Data and Artificial Intelligence to Streamline Safety Data Analyses
- Panel Member, NCHRP Project 20-102(34) Land Use Impacts of Shared and Private AVs
- Panel Member, NCHRP Project 23-17 Assessing and Measuring the Business Value of Knowledge Management
- Alpha Epsilon, The Honor Society of Agricultural, Food, and Biological Engineering
- Reviewer, *Transportation Research Record*
- Reviewer, *International Journal of Pavement Engineering*
- Reviewer, *International Journal of Environmental Research and Public Health*

Nicole Oneyear, Associate Scientist, CTRE

- Panel Member, Behavior Transportation Safety Cooperative Research Program (BTSCR) BTS 23: The Impacts of Experience on Teen Driving: Evidence from the Naturalistic Driving Study
- Member, TRB Traffic Law Enforcement Committee (ACS30)
- Missouri Valley ITE Student Liaison
- Member, Women in Transportation Seminar Iowa Chapter Sponsorship Committee
- Reviewer, *Transportation Research Record*
- Reviewer, *Journal of Transportation Engineering, Part A: Systems*
- Reviewer, *International Journal of Transportation Science and Technology*

Chris Rehmann, Faculty Affiliate

- Member, ASCE
- Member, American Geophysical Union
- Member, American Physical Society
- Reviewer, *Advances in Water Resources*
- Reviewer, *Biofouling*
- Reviewer, *Canadian Journal of Fisheries and Aquatic Sciences*
- Reviewer, *Dynamics of Atmospheres and Oceans*
- Reviewer, *Environmental Engineering Science*
- Reviewer, *Environmental Fluid Mechanics*
- Reviewer, *Estuaries and Coasts*
- Reviewer, *Experiments in Fluids*
- Reviewer, *Fluid Dynamics Research*
- Reviewer, *Geophysical Research Letters*
- Reviewer, *IEEE Journal of Oceanic Engineering*
- Reviewer, *International Journal for Sediment Research*
- Reviewer, *Journal of Atmospheric and Oceanic Technology*
- Reviewer, *Journal of Computing in Civil Engineering*
- Reviewer, *ASCE Journal of Engineering Mechanics*
- Reviewer, *ASCE Journal of Environmental Engineering*
- Reviewer, *Journal of Fluid Mechanics*
- Reviewer, *Journal of Fluids Engineering*
- Reviewer, *Journal of Geophysical Research*
- Reviewer, *ASCE Journal of Hydraulic Engineering*

- Reviewer, *Journal of Hydraulic Research*
- Reviewer, *Journal of Hydro-Environment Research*
- Reviewer, *Journal of Marine Systems*
- Reviewer, *Journal of Physical Oceanography*
- Reviewer, *Journal of Turbulence*
- Reviewer, *Limnology and Oceanography*
- Reviewer, *Limnology and Oceanography: Methods*
- Reviewer, *Marine and Freshwater Research*
- Reviewer, *Marine Ecology Progress Series*
- Reviewer, *Physics of Fluids*
- Reviewer, *Proceedings of the Royal Society of London A: Mathematical, Physical, and Engineering Sciences*
- Reviewer, *Theoretical and Computational Fluid Dynamics*
- Reviewer, *Water Research*
- Reviewer, *Water Resources Research*
- Reviewer, *Water, Air, and Soil Pollution*

Beth Richards, Program Coordinator, SUDAS

- Member, APWA
- Secretary and Treasurer, APWA Iowa Chapter
- Coordinator and Developer, APWA Iowa Chapter Top 10 Leader of the Year Award Nominations
- Member, APWA Iowa Chapter Presidential Award for Chapter Excellence (PACE) Committee

Cassandra Rutherford, Faculty Affiliate

- Chair, ASCE G-I Student Participation Committee
- Chair, ASCE G-I Soil Properties and Modeling Subcommittee for Awards
- Member, ASCE G-I Soil Properties and Modeling Technical Committee
- Member, ASCE Marine Renewable Energy Technical Committee
- Member, ASTM Soil and Rock Technical Committee (D18)
- Member, ASTM Cyclic and Dynamic Properties of Soils Technical Committee (D18.09)
- Member, DFI Women in Deep Foundations Committee
- Member, DFI Marine Foundations Technical Committee
- Member, International Society of Soil Mechanics and Geotechnical Engineering Offshore Geotechnics Technical Committee
- Member, USUCGER
- Member, ASCE
- Member, American Society of Engineering Education
- Member, National Honor Society Chi Epsilon
- Member, *DFI Journal* Board of Editors
- Reviewer, *Soils and Foundations*
- Reviewer, *Geotechnical Testing Journal*
- Reviewer, *Offshore Technology Conference*
- Reviewer, *Canadian Geotechnical Journal*
- Reviewer, *ASCE Journal of Geotechnical and Geoenvironmental Engineering*
- Mentor, Remote Excellence in Civil Engineering Education (ExCEED) Workshop
- Co-Chair, Geo-Congress 2022 Civil Engineering Education Session

Vern Schaefer, Interim Director, CEER

- Member, ASCE G-I Soil Improvement Committee
- Member, ASCE G-I Embankment, Dams, and Slopes Committee
- Member, ASCE G-I International Activities Committee
- Member, ASCE Foundation Design Standard Committee
- Member, TRB Geotechnical Asset Management Subcommittee (AKG00(1))
- Member, DFI Deep Foundations for Landslides/Slope Stabilization Committee
- Member, DFI Women in Deep Foundations Committee
- Member, ISSMGE Ground Improvement Executive Committee (TC-211)
- Member, USUCGER
- Member, American Society for Engineering Education
- Member, National Society of Professional Engineers
- Member, South Dakota Engineering Society
- Member, Association of Ground Water Scientists and Engineers
- Member, Order of the Engineer
- Member, Sigma Xi
- Reviewer, *ASCE Journal of Geotechnical and Geoenvironmental Engineering*
- Chair, U.S. National Society (USNS) of the International Society of Soil Mechanics and Geotechnical Engineering committee for the solicitation, review, and approval of USNS paper submissions to the 2022 International Conference on Soil Mechanics and Geotechnical Engineering

Behrouz Shafei, Structural Engineer

- Member, ACI Structural Plain Concrete Committee (Committee 380)
- Member, ACI Ultra-High Performance Concrete (UHPC) Committee (Committee 239)
- Member, TRB Advanced Concrete Materials and Characterization Committee (AKM50)

Jennifer Shane, Director, CMAT

- Chair, ASCE Management Practices in Construction (MPIC) Committee
- Member, ASCE Construction Research Council (CRC)
- Member, ASCE Henry L. Michel Award Committee
- Chair, TRB Construction Management Committee (AKC10 [Formerly AFH10])
- Research Coordinator, TRB Disadvantaged Business Enterprises Committee (AFH80)
- Member, Sigma Lambda Chi
- Member, ASCE *Journal of Management in Engineering* Editorial Board
- Co-Editor, ASCE *Journal of Management in Engineering* Special Collection on Diversity
- Reviewer, ASCE *Practice Periodical on Structural Design and Construction*

Anuj Sharma, Research Scientist and Leader, REACTOR

- Member and Web Administrator, TRB Traffic Signal Systems Committee (ACP 25)
- Member, TRB Traffic Signal Systems Education Subcommittee (ACP 25(1))
- Co-Editor in Chief, *Journal of Big Data Analytics in Transportation*
- Reviewer, *Analytic Methods in Accident Research*
- Reviewer, *Accident Analysis and 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*
- Webinar Organizer, Association of Transportation Professionals of Indian Origin- Transportation Research Group of India (ATPIO-TRG) Joint Webinar Series

Jiehua Shen, Faculty Affiliate

- Guest Member, American Institute of Steel Construction (AISC) Committee
- Member, ASCE
- Member, EERI
- Chi-Epsilon Advisor, Civil Engineering Honor Society
- Associate Editor, ASCE *Practice Periodical on Structural Design and Construction*
- Reviewer, *Engineering Structures*
- Reviewer, *Journal of Building Engineering*
- Reviewer, *Journal of Constructional Steel Research*
- Reviewer, *The Structural Design of Tall and Special Structures*
- Reviewer, *AISC Engineering Journal*
- Reviewer, *Advances in Computational Design, An International Journal*
- Reviewer, *Earthquake Engineering and Engineering Vibration*
- Reviewer, *Thin-Walled Structures*
- Reviewer, *Structural Engineering and Mechanics, An International Journal*
- Reviewer, NSF Division of Civil, Mechanical, and Manufacturing Innovation Proposal

Omar Smadi, Director, CTRE

- Member, International Road Federation (IRF) Washington Program Center Executive Board
- Member, ASCE Infrastructure Management Committee
- Member, ASCE Advanced Technology Committee
- Member, ASCE Highway Pavement Committee
- Friend, American Association of State Highway and Transportation Officials (AASHTO) Asset Management Subcommittee
- Associate Editor, *International Journal of Pavement Engineering*
- Honorable Editor, *MedCrave Online Journal of Civil Engineering*
- Reviewer, *Transportation Research Record*
- Reviewer, ASCE *Journal of Transportation Engineering*
- Reviewer, *Journal of the Transportation Research Forum*
- Reviewer, *Microcomputers in Civil Engineering: Journal of Computer-Aided Civil and Infrastructure Engineering*

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, ACI Iowa Chapter
- Member/Task Force Leader, ACPA Research, Technology, and Innovation (RT&I) Committee

Roy Sturgill, Construction Engineer, CMAT

- Chair, TRB Utilities Committee (AFB70)
- Member, TRB Construction Management Committee (AFH10)
- Friend, TRB Information Technology in Construction Subcommittee (AFH10(1))
- Friend, TRB Project Delivery Methods Committee (AFH15)
- Member, ASCE Utility Engineering and Surveying Institute Utility Coordination Committee
- Member, ASCE Utility Engineering and Surveying Institute Utility Risk Research and Education Committee
- Member, AASHTO Right-of-Way, Utilities, and Outdoor Advertising Control Committee's Technical Council on Utility Mapping, GIS & SUE
- Member, AASHTO Right-of-Way, Utilities, and Outdoor Advertising Control Committee's Technical Council on Utility Accommodation and Safety
- Member, AASHTO Right-of-Way, Utilities, and Outdoor Advertising Control Committee's Technical Council on Utility Project Scoping & Coordination
- Participant, AASHTO Integrated Construction Technologies Subcommittee
- Participant, AASHTO Safety, Environment, and Workforce Development Subcommittee
- Participant, AASHTO Research Subcommittee
- Panelist, NCHRP Project 20-124(6) Merging and Updating AASHTO Policy on the Accommodation of Utilities within Freeway Right-of-Way and AASHTO Guide for Accommodating Utilities within Highway Right-of-Way
- SME, FHWA EDC-6 Innovation e-Ticketing and Digital As-Builts
- Attendee, Kentucky Transportation Cabinet Utility Stakeholder Council
- Research Partner and Contributor, *The Civil Quarterly: Dodge Data and Analytics*
- 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*

Peter Taylor, Director, CP Tech Center

- Member, TRB Durability of Concrete Committee (AFN30)
- Member, ASTM Concrete and Concrete Aggregates Committee (C09)
- Vice-Chair, ACI Concrete Pavements Committee (ACI 325)
- Chair, ACI Concrete Overlays Subcommittee (ACI 325-F)
- Member, International Society of Concrete Pavements Board
- Member, ACI Iowa
- Chair, ACI Iowa Better Concrete Conference Planning Committee
- Member, ACPA Strategic Advisory Board
- Member, FHWA Sustainable Pavements Technical Working Group
- Reviewer, *Cement and Concrete Composites*
- Reviewer, *ASCE Journal of Materials in Civil Engineering*
- Reviewer, *Applied Sciences*
- Reviewer, *International Journal of Pavement Research and Technology*
- Reviewer, *Construction and Building Materials*

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, Iowa LTAP

- Member, TRB Road Weather Committee (AKR50)

Kejin Wang, PCC Engineer, CP Tech Center

- Member, 7th International Conference on Structural Engineering and Concrete Technology (ICSECT'22) Scientific Committee
- Member, 7th International Symposium on Nanotechnology in Construction (NICOM7) Honorary Advisory Committee
- Member, Federation of Environmental Issues and Its Remediation (F-EIR) Conference on Environmental Concerns and Its Remediation (ECR21) Scientific Committee
- Senior Editor, *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*

Paul Wiegand, Director, SUDAS

- Life Member, APWA
- Member, APWA Iowa Chapter
- Member, APWA Iowa Chapter Board of Directors
- Life Member, ASCE
- Member, Iowa One Call Corporation Board (Representing the Iowa League of Cities)

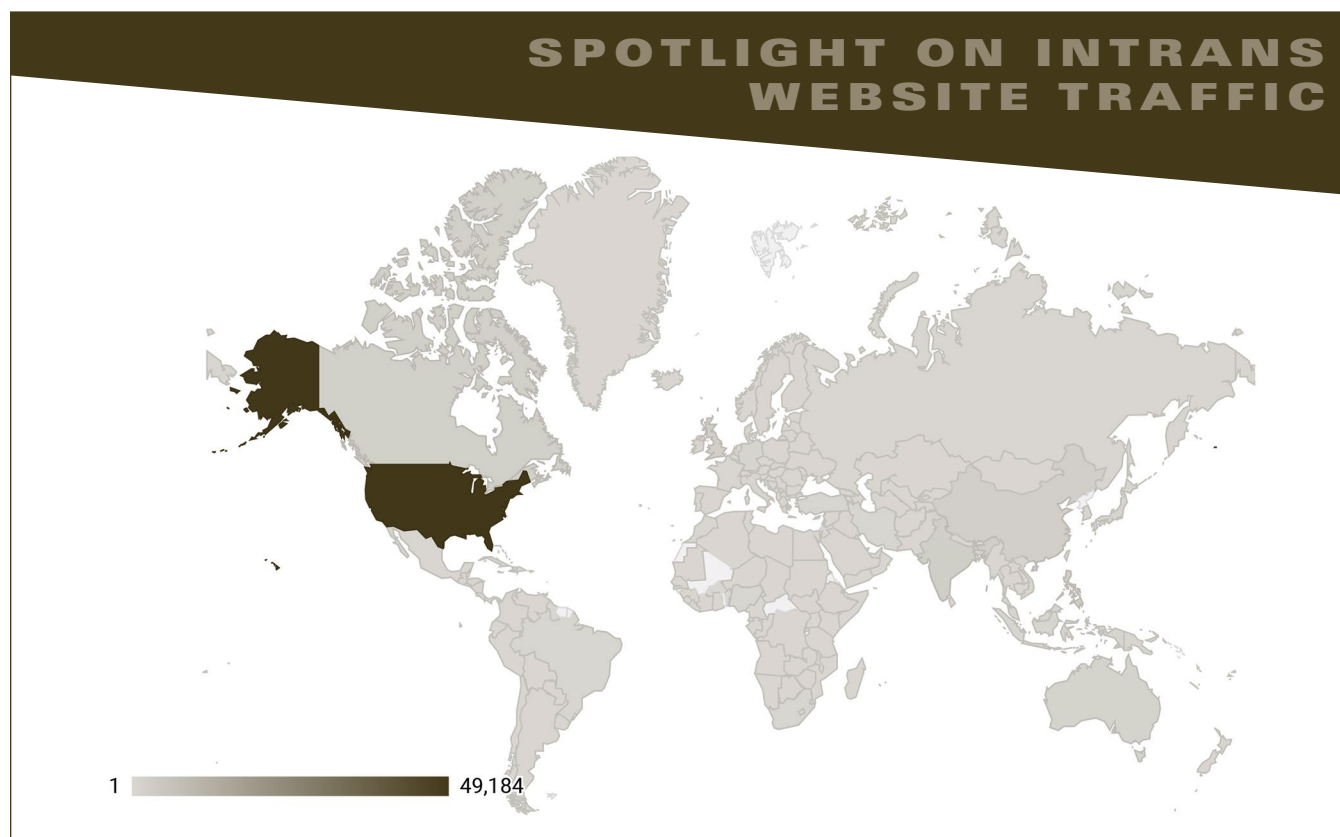
Chris Williams, Director, AMPP

- Member, ASCE
- Member, ASTM
- Member, Association of Asphalt Paving Technologists
- Member, Canadian Technical Asphalt Association
- Member, National Stone, Sand & Gravel Association Research Advisory Board

- Member, TRB Characteristics of Bituminous-Aggregate Combinations to Meet Surface Requirements Committee (AFK40)
- Reviewer, *Transportation Research Record*
- Reviewer, *Journal of the Association of Asphalt Paving Technologists*
- Reviewer, *ASCE Journal of Civil Engineering Materials*
- Reviewer, *ASCE Journal of Transportation Engineering*
- Reviewer, *Journal of ASTM International*
- Reviewer, *ASTM Journal of Testing and Evaluation*

Jonathan Wood, Faculty Affiliate, CTRE

- Member, Society of Automotive Engineers (SAE)
- Advisor, Ames Middle School Lego League
- Member, TRB Statistical Methods Committee (ABJ80/AED60)
- Member, Road Safety and Simulation (RSS) Conference Scientific Review Committee
- Panel Member, NCHRP Project 22-49 The Effect of Vehicle Mix on Crash Frequency and Crash Severity
- Panel Member, NCHRP Project 22-45 Informing the Selection of Countermeasures by Evaluating, Analyzing, and Diagnosing Contributing Factors that Lead to Crashes ■



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