

2023

OKLAHOMA TRANSPORTATION RESEARCH DAY

Transportation Excellence Through Research and Implementation

Tuesday, October 17

NATIONAL COWBOY AND WESTERN HERITAGE MUSEUM

1700 NE 63rd Street, Oklahoma City, OK 73111

Keynote Speakers, Technical Sessions, Posters, and Demos

5 PDHs will be provided to attendees

Hosted by



SOUTHERN PLAINS
TRANSPORTATION CENTER



OKLAHOMA
Transportation



ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER

PROGRAM

7:30 am **Registration and Breakfast**

8:30 am **Welcome and Opening Remarks**
Brian Taylor, Chief Engineer, Oklahoma
Transportation

8:45 am **Keynote Lectures**
*Moderator: Joni Seymour, Chief
Innovation Officer, Oklahoma
Transportation Cabinet*

From Modernization to Normalization
Tara Brown, Oklahoma Transportation

**Looking at the Crystal Ball and
Predicting the Future of Bridge
Engineering**
Atorod Azizinamini, Florida International
University

9:45 am **Networking Break and Poster and
Demo Viewing**

TECHNICAL SESSION ONE

*Moderator: Norbert Delatte, Oklahoma State
University*

10:35 am **Bond Strength of Epoxy-Coated
Reinforcing Bars in Non-Proprietary
Ultra-High Performance Concrete**
David Darwin, University of Kansas, and
Walt Peters, Oklahoma Transportation

10:55 am **Future Trends Toward Electrified
Transportation System**
Soheil Nazarian, University of Texas at El
Paso

11:15 am **Effects of Aging on Cracking
Resistance of Asphalt Mixtures**
Mohamed Elkashef, Oklahoma State
University

11:35 am **Balanced Mix Design: Comparing AR,
OK, and TX Practices**
Andrew Braham, University of Arkansas

11:55 am **Lunch and Poster and Demo Viewing**

TECHNICAL SESSION TWO

*Moderator: Gerald Miller, The University of
Oklahoma*

1:30 pm **Laboratory Performance and
Implementation of UHPC Connections
in Oklahoma**
Royce Floyd, The University of Oklahoma

1:50 pm **Smartphone-Based Networks for
Roadway Condition Monitoring and
Early Warning System**
Nasim Uddin, University of Alabama

2:10 pm **Towards Resilient, Equitable, and
Sustainable Transportation (REST)
Systems Using Topological Credentials
and Network Interdependencies**
Arif Sadri, The University of Oklahoma

2:30 pm **Oklahoma LTAP Program Information**
Kimberly Johnson, Oklahoma State
University

3:00 pm **Networking Break and Poster and
Demo Viewing**

3:30 pm **Poster Awards Ceremony and Video
Presentations of Winning Posters**
*Moderator: Bryan Cooper, Oklahoma
Transportation*

4:00 pm **Closing Remarks**
Tara Brown, Oklahoma Transportation
and Musharraf Zaman, Southern Plains
Transportation Center, The University of
Oklahoma

KEYNOTE SPEAKERS



Tara Brown was named the Oklahoma Transportation Cabinet's Deputy Chief Innovation Officer in February 2022. Brown assists Chief Innovation Officer Joni Seymour in overseeing all modernization and innovation-related efforts, including the Autonomous

Vehicle Working Group, Work Zone Safe Program and research activities for the Transportation Cabinet. Since 2017, Brown served as the Oklahoma Department of Transportation's Coordinator of Executive Administration. From 2013–2017, she served in numerous and oftentimes concurrent roles within the Department. Brown holds a bachelor's degree from Oklahoma State University in Sociology and began her state service career at the Oklahoma Department of Human Services in 2009. Later she moved to the Oklahoma Public Employees Retirement System and eventually joined ODOT in 2013. Originally from Ardmore, she lives in Moore with her three children.



Atorod Azizinami is the Director of Infrastructure Research and Innovation at Florida International University and Vasant Surti Professor of Civil Engineering. Atorod is also the Director of the Accelerated Bridge Construction University Transportation Center (ABC-

UTC) at FIU. He received his B.S. with Distinction from the University of Oklahoma and M.S. and Ph.D. from the University of South Carolina. He has worked for five years as a Structural engineer. He has carried out more than \$60M research as Principal Investigator and has graduated more than 35 Ph.D. students. His research activities have covered many aspects of structural engineering. Since 1995, he has focused on bridge engineering research. He has received numerous awards, including receiving President Obama's White House Champion of Change: Transportation Innovator award in 2015, which was given to him in a ceremony at the White House. His hobbies include music, watching OU football, martial arts, and spending time with family.

SPEAKERS AND MODERATORS



Brian Taylor was named Oklahoma Transportation's Chief Engineer in March 2019. Taylor oversees all statewide engineering and operations activities. He replaced Casey Shell who retired in 2018. Taylor began his career in Southeastern Oklahoma's Division Two Antlers Residency in 1990. He moved up to Associate Engineer

before becoming a Division Two Traffic Engineer in 1996. From 2008 to 2013, Taylor served as Division Maintenance Engineer, which included oversight of nine southeastern Oklahoma counties. From 2013 to 2019, Taylor served as the Division Four Engineer. As the Division Engineer in the central region, he oversaw the construction and maintenance of Logan, Payne, Kingfisher, Oklahoma, Canadian, Garfield, Noble, Grant and Kay counties which also includes the Oklahoma City metro. Taylor supervised the I-235/Off-Broadway project during this period along with several other accomplished projects. Taylor, a native of Texarkana, Texas, earned his bachelor's degree in civil engineering from Texas A&M University and became a Professional Engineer in 1995. Taylor and his wife, Deanne, have two children and live in Stillwater.



Joni Seymour was selected to serve as the Chief Innovation Officer (CINO) for the Oklahoma Transportation Cabinet Agencies in April 2021, which include the Oklahoma Department of Transportation (ODOT), Oklahoma Turnpike Authority (OTA), and Oklahoma Aeronautics Commission (OAC). In the newly created CINO position, Seymour works with every

business unit across the entire state Transportation Cabinet to promote innovation that streamlines organizational and technological processes. Most recently Seymour served as the Chief Information Officer for OTA, beginning in 2017. At OTA, she was responsible for information technology matters relating to personnel, budget, and the overall technological systems at the agency. Her career with OTA began in 2004 as a technology analyst. In 2010, she was promoted to be the Software Development Manager. She worked in this role until 2013 when she left to work in the private sector briefly before returning to OTA in 2017. While at OTA, Seymour supervised multiple system developments and upgrades, including the ongoing switch to cashless tolling. Seymour continues her work in the interoperable world and currently serves as Vice Chair of the Central US Interoperability Steering Committee.



Norbert J. Delatte, Jr. is the M.R. Lohmann Endowed Professor of Engineering and the Head of the School of Civil and Environmental Engineering at Oklahoma State University. He received his B.S. in Civil Engineering from The Citadel in 1984, a Master's Degree in Civil Engineering from The Massachusetts Institute of Technology in 1986, and a Ph.D.

in Civil Engineering from The University of Texas at Austin in 1996. He is the Chair of ACI Committee 522 Pervious Concrete as well as the former Chair of ACI Committee 325 Concrete Pavements and of Committee 327 Roller Compacted Concrete Pavements and of ACI S803 Faculty Network, Secretary of ACI 522 Pervious Concrete, and a member of several other ACI Committees. Dr. Delatte is the author of *Beyond Failure: Forensic Case Studies for Civil Engineers* (ASCE Press, 2009) and *Concrete Pavement Design, Construction, and Performance*, 2nd Edition (Taylor and Francis, 2014). In addition, he is the Editor of *ASCE's Journal of Performance of Constructed Facilities*. Dr. Delatte is a registered professional engineer in the States of Oklahoma, Ohio, and Alabama, and in the Commonwealth of Virginia.



David Darwin is the Chair and Deane E. Ackers Distinguished Professor of Civil, Environmental, Architectural Engineering at the University of Kansas. He received his BS in Civil Engineering and MS in Structural Engineering from Cornell University and his Ph.D. in Civil Engineering from the University of Illinois at Urbana-Champaign. His areas of research

include structural engineering and engineering materials, reinforced concrete behavior, concrete materials and constructions, bond between reinforcing steel and concrete, cracking in reinforced concrete structures, corrosion of reinforcing steel, steel-concrete composite structures, and durability of transportation structures. He is a fellow of the American Association for the Advancement of Science, a fellow and an honorary member of American Concrete Institute, a distinguished member of the American Society of Civil Engineers (ASCE), and a fellow of the Structural Engineering Institute of ASCE.



Walt Peters has worked for ODOT in the Bridge Division for the last 50 years, except for when he was an EIT in 1973. He spent the first 15 years of his career in bridge design, progressed to a project manager, and is presently serving as the Assistant Bridge Engineer for Maintenance. He primarily coordinates bridge research, bridge

inspection contracts, and specifications. Walt and his wife Rita have three children and six grandchildren. A graduate of Texas Tech University, he likes model railroading (S scale), Bible study, and bike riding.



Soheil Nazarian is a professor of civil engineering and the director of the Center for Transportation Infrastructure Systems at the University of Texas El Paso. He has over 35 years of experience in materials, design, evaluation, and non-destructive testing related to geotechnical and transportation infrastructure, and has been the

PI and Co-PI of over 100 research projects funded by various agencies. Dr. Nazarian has also co-authored more than 250 articles sponsored by the ASCE and the Transportation Research Board. He is also the Chair of the Geotechnical Instrumentation and Modeling Committee of the Transportation Research Board. Additionally, he is a member of the Executive Board of the International Society of Intelligent Construction.



Mohamed Elkashef is an Assistant Professor in the School of Civil and Environmental Engineering at Oklahoma State University (OSU). He holds a Ph.D. in Structural Engineering from Cairo University, Egypt and a Ph.D. in Civil Engineering from Iowa State University, USA. He has more than 20 years of industry and academic experience on pavements,

and has published more than 40 journal papers. He holds two patents on using bio additives to recycle asphalt materials. Prior to joining OSU, he worked as an associate research scientist at the University of California, Davis. Dr. Elkashef serves on the Transportation Research Board AKM20 binder and on the highway pavements committee, ASCE. At OSU, he teaches courses on civil engineering

materials, asphalt mix design, and pavement rehabilitation. He is also a registered professional engineer in Nevada and California.



Andrew Braham is a Professor in the Department of Civil Engineering at the University of Arkansas and is a registered professional engineer in Arkansas. His current research is focused on asphalt emulsions, pavement preservation, pavement maintenance and rehabilitation, sustainability, and asphalt mixtures. He has been a PI and Co-PI on

numerous projects with government agencies and private industry at a local, state, national, and international level, bringing in over \$4.1 million as a PI and about \$1.3 million as a Co-PI. During his career, he has published 47 peer reviewed publications and developed a “Pavinar” webinar series that can be found on YouTube. He teaches courses on transportation infrastructure, sustainability, pavement design, pavement production and construction, and pavement maintenance and rehabilitation. He has supervised 20 master’s theses and Ph.D. students at Arkansas. He is the chair of the Transportation Research Board committee AKT30, Pavement Maintenance, and is an active member in both the Asphalt Emulsion Manufacturing Association and the International Slurry Surfacing Association.



Gerald A. Miller is currently a Rapp Presidential Professor in the School of Civil Engineering and Environmental Science (CEES) at the University of Oklahoma (OU). He has been at OU since 1994 and most recently served as Associate Director of the CEES (2013-2022) and Associate Director of Southern Plains Transportation Center (2013-

2019). He received his B.S. (1987) and M.S. (1989) degrees from Clarkson University in Potsdam, N.Y., and his Ph.D. in 1994 from the University of Massachusetts at Amherst. Dr. Miller is a registered professional engineer in Oklahoma and has been active in geotechnical research, teaching, and consulting for nearly 37 years. His primary areas of interest include chemical stabilization of soils and unsaturated soil mechanics with applications to in situ testing, compacted soil behavior, foundation engineering and soil-structure interaction.



Royce Floyd is an Associate Professor in the School of Civil Engineering and Environmental Science at the University of Oklahoma (OU) and is a registered structural engineer in Oklahoma. He is also one of the Associate Directors of the Southern Plains Transportation Center (SPTC). His current research focus is on extending the life of

transportation infrastructure using innovative concrete materials, such as ultra-high performance concrete and calcium sulfoaluminate cement concrete. He has been a PI or Co-PI on more than twenty projects sponsored by ODOT, SPTC, and ABC-UTC and has published more than 40 journal articles. He teaches courses on reinforced concrete, prestressed concrete, and structural wood design and has supervised more than 20 Master’s theses and Ph.D. dissertations at OU. He is member of the ASCE, Precast/Prestressed Concrete Institute, and American Concrete Institute.



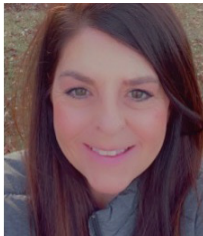
Nasim Uddin is a professor and Graduate Program Director of Civil Engineering at the University of Alabama Birmingham. His research interests include UAVs and robotics, disaster risk management, and structural safety. His research has been funded by the National Science Foundation, the Federal Highway Administration, and the US

Department of Transportation. He currently serves as the editor-in-chief of the ASCE Natural Hazards Review Journal. Additionally, he is an associate editor of the ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems. Additionally, he serves on the executive committee of the ASCE Council on Disaster Risk Management, is Chair of the ASCE Walter Huber Civil Engineering Research Award Committee, and a Faculty Fulbright Scholar.



Arif Sadri is the director of the TRICS lab and an Assistant Professor in the School of Civil Engineering and Environmental Science (CEES) at the University of Oklahoma (OU). His research focuses on transportation systems and their dependence on other systems, such as social and physical, in the context of hazards. He specializes in resilience

engineering, evacuation modeling, and machine learning. He has been honored as a Fellow at Florida International University, as well as by Purdue University for Excellence in Interdisciplinary Research. Dr. Sadri's research has been funded by the National Science Foundation, the US Department of Transportation, the Oklahoma Department of Transportation, and the United States Agency for International Development.



Kim Johnson serves as the Oklahoma Local Technical Assistance Program (LTAP) Manager and as the Southern Tribal Technical Assistance Program (TTAP) Center Director. Before working in Oklahoma, she worked for the Texas Local Technical Assistance Program (TxLTAP) and the previous TTAP center as a subject matter expert. Johnson and her team

provide transportation training and technical assistance programs to road agencies to help preserve and enhance local road systems. Before working in the transportation industry, she earned a Bachelor's degree in Science and a Master's degree in Education and spent more than fifteen years in K-12 and Higher Education. Johnson joined the Oklahoma LTAP Office in November of 2021 and the Southern TTAP Office in December of 2022. She looks forward to continuing to serve all road agencies.



Bryan Cooper began his career at ODOT in 1988 as a draftsman in the Bridge Division, drawing bridge plans with ink and vellum on the drafting table and transitioning to CADD systems in 1990. He transferred to the Research Division in 1994, working on various research projects in the field. He graduated from the Certified Public Manager Program

in 2000, winning the Good Work Award for the best project

paper and the George C. Askew Award from the American Academy of Certified Public Managers for the same project. He went to work in the Rail Division in 2001, working in the Safety Branch, upgrading at-grade rail crossings. He then returned to the Planning and Research Division in 2008 where he was named the Field Services Manager, while managing the Long-Term Pavement Performance Program and the Local Technical Assistance Program. Cooper is also a member of the State Transportation Innovation Council and the Traffic Incident Management Coalition.



Musharraf Zaman holds the David Ross Boyd and Aaron Alexander Professorship in Civil Engineering and Alumni Chair Professorship in Petroleum and Geological Engineering at the University of Oklahoma. He has been serving as the director of the Southern Plains Transportation Center since 2013. His leadership has been

instrumental in strengthening partnerships with state DOTs and the private sector and maintaining impactful research, workforce development, outreach, and tech transfer programs regionally. He served as the associate dean for research and graduate education at the OU Gallogly College of Engineering from July 2005 to December 2013. During his tenure at OU, he has received several prestigious national-level teaching awards from the American Society of Engineering Education and more than \$60 million in external funding from various state and federal agencies and the industry. He has published more than 475 peer-reviewed journal and conference papers and 17 books and book chapters and supervised more than 90 theses and dissertations. Several of his papers have won prestigious awards from international societies and organizations. He is a fellow and life member of the American Society of Civil Engineers. He served as the editor-in-chief of the International Journal of Geomechanics, ASCE for 11 years and is currently serving as a co-editor. Additionally, he has been serving as an editor-in-chief of the International Journal of Pavement Research and Technology since 2022.

DEMO PRESENTATIONS

Investigation of the Aging Behavior of Asphalt Binders at Different Production Stages and During the Service Life of the Pavement

Mohamed Elkashef, Oklahoma State University

A Fatigue Assessment Framework for Steel Bridges using Fiber Optic Sensors and Machine Learning

Mohamed Soliman, Oklahoma State University

Bond Behavior of Epoxy Coated Reinforcing Bars in Non-Proprietary UHPC

David Darwin, University of Kansas

Designing RC Beam Strengthening by Combining FRP Flexural and Shear Strengthening Techniques

Shreya Vemuganti, The University of Oklahoma

Asphalt Binder Quality Test (ABQT) – A Quick Test to Determine PG Grade of Binders

Raj Dongre, Dongre Laboratory Services Inc.,
FHWA Consultant for Turner Fairbanks

PaveVision 3D

Joshua Li, Oklahoma State University

Roadside Vegetation Management

Dennis Martin, Oklahoma State University

Local Technical Assistance Program (LTAP)

Kim Johnson, Oklahoma State University

Unmanned Aerial Systems (UAS): New UAS Platforms

Jamey Jacobs, Oklahoma State University

Oklahoma Transportation Library/Southern Plains Transportation Center

Michael Molina and Syed Ashik Ali, The University of Oklahoma

Traffic Incident Management

Roger Straka and Caitlyn Rigdon, Oklahoma Transportation

POSTER JUDGES

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Oklahoma
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