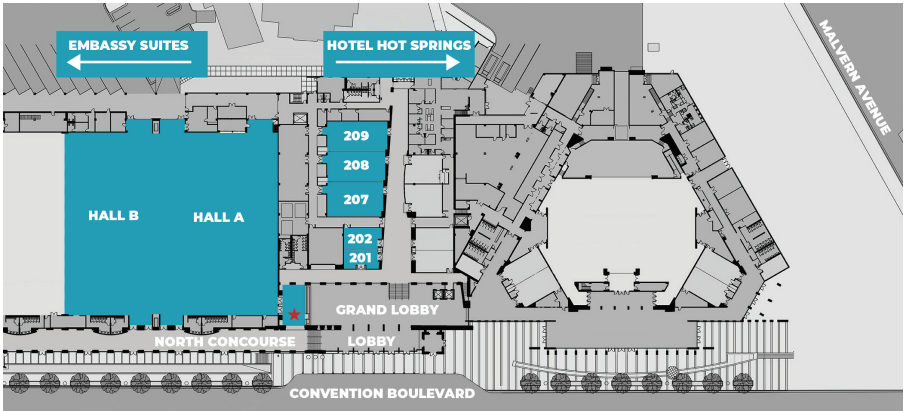


TRANSPORTATION **CONFERENCE** & EQUIPMENT EXPO

HOT SPRINGS | MAY 21-23, 2024



ARDOT **TRC** **TRANSPORTATION**
RESEARCH COMMITTEE



REGISTRATION ★

Grand Lobby | North Concourse Upper Level

Registration is required for all attendees and includes admission to all sessions and exhibit hall area. Attendees must wear a registration badge.

TUESDAY, MAY 21	WEDNESDAY, MAY 22	THURSDAY, MAY 23
9:00 AM - 5:00 PM	7:30 AM - 5:00 PM	7:30 AM - 10:00 AM

EXHIBIT HALL | HALL A & B

Come and see a variety of transportation-related products and services showcased by universities, industry representatives, transportation organizations, and ARDOT Research staff. Join us for coffee with the Exhibitors Wednesday and Thursday morning starting at 7 AM.

TUESDAY, MAY 21	WEDNESDAY, MAY 22	THURSDAY, MAY 23
Visit With Vendors 9:00 AM - 12:00 PM	Break 9:30 AM - 10:00 AM	Break 9:30 AM - 10:00 AM
Lunch, Exhibitor and Poster Presentations 12:00 PM - 1:30 PM	Lunch, Exhibitor and Poster Presentations 12:00 PM - 1:30 PM	
Break 3:00 PM - 3:30 PM	Break 3:00 PM - 3:30 PM	

WI-FI

Free Wi-Fi is available in all meeting rooms and public areas of the Hot Springs Convention Center. The network name will still be known as **Hot Springs Wi-Fi** and the password required is **spacity2024**.

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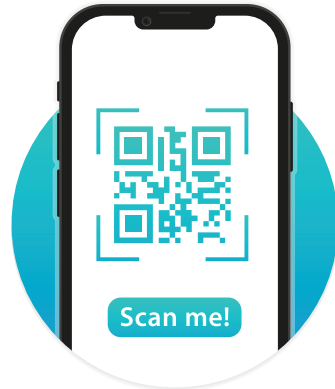
Make sure to stop by and visit our exhibitors

SCAN FOR PDH CREDITS

SCAN THE QR CODES

And Enter Your Information Each Day To Get Your Professional Development Hours!

1. Once For The General Session
2. Once In The Morning
(Covers All AM Sessions)
3. Once In The Afternoon
(Covers All PM Sessions)
4. Once For Each Poster Session



Codes will be clearly marked and posted at Registration, outside the Breakout Session Rooms, and at the ARDOT Booth. It's quick and easy!

REMEMBER: NO SCAN = NO HOURS

WELCOME



A warm welcome to the Transportation Research Committee's 2024 Transportation Conference & Equipment Expo. As always, I'm sure we can expect a wonderful time here in the Historic District of Hot Springs National Park!

The Department currently supports 17 research projects that include topics in balanced mix design (BMD), liquefaction evaluation and mitigation procedures, low shrinkage concrete mixtures, and automated work zone system. In this last year, three new in-house projects were funded, including evaluation of alkali-silica-reaction (ASR) potential for aggregate sources in Arkansas, field evaluation of high-performance cold mix (HPCM) products, and evaluation of air in concrete.

There are three new projects lined up for next fiscal year. We will be exploring alternative methods to establishing vegetation on cut slopes, developing modern methods for evaluation of timber pile capacity, and exploring the feasibility of vehicle probe data for origin-destination estimation.

I firmly believe that implementation is the true measure of a research project's success. Moving research ideas into transportation practice takes effort and input from our partners in academia and industry, but guidance from subject matter experts within ARDOT is the key to guaranteed success. I want to say a heartfelt "Thank You" to those of you who actively participate in current projects and encourage others to Champion an idea you are passionate about.

PAUL TINSLEY
Transportation Research Committee

AT-A-GLANCE

TUESDAY, MAY 21

GENERAL SESSION | ROOM 207 - 209

Moderator - Paul Tinsley

12:00 PM - 1:30 PM LUNCH | EXHIBIT HALL

1:00 PM - 1:30 PM POSTER SESSION | EXHIBIT HALL

1:30 PM - 2:00 PM **ARDOT Welcome***
Director Lorie Tudor, P.E., ARDOT

2:00 PM - 2:30 PM **Federal Highway Administration Update***
Vivien Hoang, FHWA

2:30 PM - 3:00 PM **Creating Equitable Traffic Safety through a Vision Zero Approach**
Dean Scott, NHTSA

3:00 PM - 3:30 PM **TRB 101: What You Need To Know About The Transportation Research Board**
Stephen Maher, TRB

3:30 PM - 4:00 PM BREAK | EXHIBIT HALL

4:00 PM - 4:30 PM **From the Flintstones to the Jetsons: How Transportation Affects the Protection of Roadway Workers**
Cindy Williams, ATSSA; Sarah Stillman, ATSSA

4:30 PM - 5:30 PM **Safety Advances for Roadway Workers Panel Moderated by Deric Wyatt**
Spencer Stillman, Time Striping; Matt Emberton, ARDOT; Eddie Tanner, ARDOT

*Not eligible for PDH credit.

AT-A-GLANCE WEDNESDAY, MAY 22

SAFE SYSTEMS PLANNING AND OPERATIONS | ROOM 207

Moderator - Adnan Qazi

TECHNOLOGY & INNOVATION | ROOM 209

Moderator - Sharon Hawkins

<p>8:00 AM - 8:30 AM</p> <p>Lighting in the Balance: The Highs and Lows Roadway Lighting Ronald Gibbons, VTTI</p>	<p>8:00 AM - 9:00 AM</p> <p>EnViewer to EnQuery Linda DeMasi, ARDOT; Marisol Filares, ARDOT; Robert Reed, ARDOT</p>
<p>8:30 AM - 9:00 AM</p> <p>2024 Solar Eclipse Traffic Management Plan Nicci Tiner, Garver</p>	<p>8:30 AM - 9:00 AM</p> <p>Digital Engineering QC - A New Way Josh Kleitsch, Olsson</p>
<p>9:00 AM - 9:30 AM</p> <p>Four Minutes of Darkness, Lessons Learned from the 2024 Solar Eclipse Michael Kelly, ARDOT</p>	<p>9:00 AM - 9:30 AM</p> <p>Safety Analysis Process: Core Module #7 Walt Catlett, Catlett Engineering</p>
<p>9:30 AM - 10:00 AM BREAK EXHIBIT HALL</p>	
<p>10:00 AM - 10:30 AM</p> <p>The Safe Systems Pyramid Rachael Thompson Panik, Georgia Institute of Technology</p>	<p>10:00 AM - 10:30 AM</p> <p>142+ Hours Valarie Nichols, ARDOT; Kaili Teeter, ARDOT</p>
<p>10:30 AM - 11:00 AM</p> <p>A Crash Course on Arkansas' Data Anthony Dao, ARDOT</p>	<p>10:30 AM - 11:00 AM</p> <p>What Can Right of Way Engineering Do For You? Genevieve Haller, DeIDOT</p>
<p>11:00 AM - 11:30 AM</p> <p>Stuck No More! ARDOT's Incident Management On I-40 Edward Holcomb, Garver; Nicci Tiner, Garver</p>	<p>11:00 AM - 11:30 AM</p> <p>ARDOT Real-Time GNSS Network Eric Benson, ARDOT</p>
<p>11:30 AM - 12:00 PM</p> <p>Road Safety Audits Walt Catlett, Catlett Engineering</p>	<p>11:30 AM - 12:00 PM</p> <p>Stuck In Traffic? We Know Why! Sharon Hawkins, ARDOT; Christopher Pipkin, ARDOT</p>
<p>12:00 PM - 1:30 PM LUNCH EXHIBIT HALL</p>	
<p>1:00 PM - 1:30 PM POSTER SESSION EXHIBIT HALL</p>	

AT-A-GLANCE

WEDNESDAY, MAY 22

SAFETY IS NO ACCIDENT | ROOM 207

Moderator - Hussain Alfaraj

RESEARCH UPDATE | ROOM 209

Moderator - Sanghyun Chun, Ahmed Muftah

1:30 PM - 2:00 PM	<p>Making Work Zones Safer</p> <p>Henry Brown, University of MO, Columbia</p>	1:30 PM - 2:00 PM	<p>TRC2104 - Maintenance Guidelines for MSE Walls</p> <p>Michelle Barry, UAF</p>
2:00 PM - 2:30 PM	<p>Traffic Incident Management and TIM Training Facility</p> <p>Lieutenant Brad Perkins, AHP</p>	2:00 PM - 3:00 PM	<p>TRC2101 - Update of the ARDOT Workforce Forecasting System</p> <p>Suman Mitra, UAF</p>
2:30 PM - 3:00 PM	<p>TSMO Safety Innovation at ARDOT</p> <p>Hussain Alfaraj, ARDOT</p>	2:30 PM - 3:00 PM	<p>TRC2102 - Effect of Asphalt-Binder Compatibility on Performance of Asphalt Mixtures in Arkansas</p> <p>Zahid Hossain, ASU</p>
3:00 PM - 3:30 PM	BREAK EXHIBIT HALL		
3:30 PM - 4:00 PM	<p>Safety Assessment For Every Roadway (SAFER)</p> <p>Katy Harlan, MODOT</p>	3:30 PM - 4:00 PM	<p>TRC2103 - Developing Guidelines for Evaluating Weathering Steel Bridges</p> <p>Ernie Heymsfield, UAF</p>
4:00 PM - 4:30 PM	<p>High Crash Work-Zones</p> <p>Tyrone Dillard, AHP</p>	4:00 PM - 4:30 PM	<p>TRC2303 - Evaluation of Impacts Due to A Bridge Closure</p> <p>Sarah Hernandez, UAF</p>
4:30 PM - 5:00 PM	<p>Charting a Course to Safer Streets</p> <p>Dane Eifling, Chris Brown, and Matt Mihalevich, City of Fayetteville</p>	4:30 PM - 5:00 PM	<p>TRC2203 - Low Shrinkage Concrete Mixtures for Arkansas</p> <p>Shuyah Ouoba, UAF</p>
5:00 PM - 5:30 PM	<p>Right Vs Wrong: Reducing Wrong-Way Crashes In Arkansas Using Passive And Active Systems.</p> <p>Joe Hawkins, ARDOT</p>	5:00 PM - 5:30 PM	<p>TRC2204 - Materials Testing Specifications for Drilled Shaft Concrete</p> <p>Cameron Murray, UAF</p>

AT-A-GLANCE THURSDAY, MAY 23

BRIDGE TECH | ROOM 207

Moderator - Mark Simecek

INFRASTRUCTURE MATERIALS | ROOM 209

Moderator - Paul Tinsley

8:00 AM - 8:30 AM
ARDOT's New Bridge Inspection Technology
Caleb Lambert & Jake Norris, ARDOT

8:00 AM - 8:30 AM
FHWA - Mobile Asphalt Technology Center
Michael Huner, FHWA

8:30 AM - 9:00 AM
Why Bridge Load Ratings are Important
Tim Armbrecht, Michael Baker Intl.

8:30 AM - 9:00 AM
Effect of Lag and Dwell Time on Balanced Mix Design Testing
Ram Veeraghavan, FHWA

9:00 AM - 9:30 AM
Rehabilitation of the Garrison Avenue Bridge in Fort Smith, Arkansas
Ed Liberati, Hydro-Technologies

9:00 AM - 9:30 AM
Partnering Pavement Performance
Tisha Reynolds, ARDOT

9:30 AM - 10:00 AM BREAK | EXHIBIT HALL

10:00 AM - 10:30 AM
Utilizing Contractual BIM in your Structures Workflow
Daniel Jenson, Michael Baker Intl.

10:00 AM - 10:30 AM
New Friction/Polishing Test for Asphalt Mixtures
Wade Collins, Pavement Technology Inc.

10:30 AM - 11:00 AM
TRC1903 - Investigating Concrete Deck Cracking in Continuous Steel Bridges
Ernie Heymsfield - UAF

10:30 AM - 11:00 AM
Earthquake-Induced Soil Liquefaction and Transportation Structures
David Baska, Terracon

11:00 AM - 11:30 AM
A View From Below: The ARDOT Dive Team Initiative
Nate Brown & Tori Elliott, ARDOT

11:00 AM - 11:30 AM
Understanding Alkali-Silica Reaction Susceptibility of Aggregates Used in Concrete
Chandni Balachandran, FHWA

11:30 AM - 12:00 PM
wikiHow to Repair a Bridge in Arkansas?
Kevin Weston, ARDOT

11:30 AM - 12:00 PM
Practical Applications of the TFHRC ASR Management Tools
Jose Muñoz, FHWA

AT-A-GLANCE EQUIPMENT & PROCUREMENT AGENDA

ROOM 201-202

TUESDAY, MAY 21

10:00 AM - 10:45 AM	Vendors Roundtable
10:45 AM - 11:15 AM	BREAK EXHIBIT HALL
11:15 AM - 12:00 PM	Vendors Roundtable
12:00 PM - 1:30 PM	LUNCH EXHIBIT HALL
1:30 PM - 2:00 PM	ARDOT Welcome Director Lorie Tudor, P.E., ARDOT <i>(ROOM 207-209)</i>
2:30 PM - 4:30 PM	EMS Roundtable

WEDNESDAY, MAY 22

8:00 AM - 8:15 AM	Introduction of Jeff Holabaugh and Patrick Skoglund Danny Keene, ARDOT
8:15 AM - 9:30 AM	FMS Team Meeting Jeff Holabaugh, Dye Management Group, Inc
9:30 AM - 10:00 AM	Visit with Vendors on the Floor
10:00 AM - 12:00 PM	ATOM Fleet Management System Patrick Skoglund, Avery
12:00 PM - 1:30 PM	LUNCH
1:30 PM - 2:30 PM	Walkthrough ARDOT Procedures Chris Lusk, ARDOT
2:30 PM - 3:00 PM	Visit With Vendors On The Floor
3:00 PM - 4:30 PM	Q&A Patrick Skoglund, Avery, and Chris Lusk, ARDOT

THURSDAY, MAY 23

8:00 AM - 11:30 AM	Q&A Patrick Skoglund, Avery, and Chris Lusk, ARDOT
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Don't forget to scan the Poster Session QR code to receive the credit for each day's session.

Project posters will be displayed throughout the conference in the Exhibit Hall entranceway. There are posters for all ongoing TRC projects, several projects funded through the Transportation-Related Research & Workforce Development Grant Program (formerly TRRG), and other transportation-related research from across the state. There will be a poster session during the final half hour of the lunch break Tuesday and Wednesday, 1:00 PM- 1:30 PM. We have invited the poster authors to be available to discuss their project and answer questions during that time.

Tuesday

TRC1903 - Investigating Concrete Deck Cracking in Continuous Steel Bridges	UAF	Ernie Heymsfield & Cameron Murray
TRC2102 - Effect of Aggregate-Binder Compatibility on Performance of Asphalt Mixes in Arkansas	UAF	Zahid Hossain
TRC2106 - Applying UAS Lidar for Developing Small Project Terrain Models	UAF	Clint Wood
TRRWDPG 2023 - Unraveling Commuting Patterns in Small to Medium Size Cities	UAFS	Ann-Gee Lee
TRRWDPG 2023 - Transportation Consumer and Expenditures for Low-Income Families	UAFS	Casey Craft and Jim R. Wollscheid (Ann-Gee Lee)
TRRWDPG 2023 - Health Effects of Cycling and Walking	UAFS	Lily Hinton and Omer Kutlubay (Ann-Gee Lee)
TRRWDPG 2023 - NEMT Case Studies in Pennsylvania, Maine & Arkansas	UAFS	Ann-Gee Lee & Kristing Tardif
TRRWDPG 2023 - Determinants of Arkansas Transit Ridership & Transportation Expenditures	UAFS	Ann-Gee Lee
TRC2107 - Non-Nuclear Moisture Content and Density Determination	UAF	Rick Coffman
TRC2104 - Maintenance Guidelines for Mechanically Stabilized Earth (MSE) Walls	UAF	Michelle Barry
TRC2403 - Evaluation of Air in Concrete	ARDOT	Jared Johnson
TRC2402 - Field Evaluation of High-Performance Cold Mix Products	ARDOT	Shawn Hasley

TRC POSTER SESSION

Scan
for
PDH
hours!



Don't forget to scan the Poster Session QR code to receive the credit for each day's session.

Wednesday

TRC2103 - Developing Guidelines for Evaluating Weathering Steel Bridges	UAF	Ernie Heymsfield
TRC2105 - Innovative Countermeasures to Deter Wrong-Way Driving	ARDOT	Kim Romano
TRC2203 - Low Shrinkage Concrete Mixtures for Arkansas	UAF	Cameron Murray
TRC2201 - Update to ARDOT Superpave Gyrotory Compaction (SGC) Specification to Increase Pavement Durability	UAF	Andrew Braham
TRC2202 - Updating ARDOT Liquefaction Evaluation Procedures	UAF	Clint Wood
TRC2204 - Materials and Testing Specifications for Drilled Shaft Concrete	UAF	Rick Coffman
TRC2303 - Evaluation of Impacts Due to a Bridge Closure: A Case Study of the Mississippi River Bridges in Arkansas	UAF	Sarah Hernandez
TRRGP 2021 - Feasibility Assessment of Reclaimed fly Ash (RFA) and Ground Tire Rubber (GTR) Modified Concrete	ASU	Zahid Hossain
TRRWDPG 2023 - Sustainable Use of Rice Husk and Scrap Tires as Construction Materials of Transportation Infrastructures	ASU	Zahid Hossain
TRRWDPG 2023 - Entry-Level Heavy Equipment Operator Training for Highway Construction	UACCM	Jessica Rohlman
Impact of Equipment Type on Particle Size Measurement of Civil Engineering Materials	UAF	Tanner Turben
TRC2101 - Update of the ARDOT Workforce Forecasting System	UAF	Suman Mitra
TRC2302 - Development of Pedestrian and Bicyclist Flow Volumes and Risk Factors	UAF	Suman Mitra
TRC2301 - Smart Work Zone (SWZ) System Design, Specifications, Estimates, and Implementation Guidelines	UAF	Suman Mitra

SESSION DETAILS

TUESDAY, MAY 21

TUESDAY	GENERAL SESSION ROOM 207 - 209 Moderator - Paul Tinsley
12:00 PM - 1:30 PM	LUNCH EXHIBIT HALL
1:30 PM - 2:00 PM	ARDOT Welcome* Director Lorie Tudor, P.E., ARDOT
2:00 PM - 2:30 PM	Federal Highway Administration Update* Vivien Hoang, FHWA <i>An update from FHWA on the implementation of the Infrastructure Investment and Jobs Act (IIJA) and other initiatives from around the agency, including Safety, Buy America, and Notices of Funding Opportunity.</i>
2:30 PM - 3:00 PM	Creating Equitable Traffic Safety through a Vision Zero Approach Dean Scott, NHTSA <i>Will discuss how the National Roadway Safety Strategy (NRSS) and SSA fit into the NHTSA Vision Zero Goal. How our new emphasis on community engagement allows overrepresented and underserved populations to give Feedback on how to address traffic safety concerns in their communities.</i>
3:00 PM - 3:30 PM	TRB 101: What You Need To Know About The Transportation Research Board Stephen Maher, TRB <i>What is TRB, what do they do? This presentation will provide a brief background on TRB and the organization they are part of: The National Academies of Sciences, Engineering, and Medicine. Specific information on the TRB's Technical Activities Division (TAD) will be provided. TAD staff support TRBs 177 Technical Standing Committees, host the TRB Annual Meeting in DC each January, and conduct visits to the state DOTs and other sponsors each year. It will conclude with noting the benefits of and how to get involved in TRB. Participants will get a better understanding of how TRB TAD can serve them.</i>

*Not eligible for PDH credit.

3:30 PM - 4:00 PM

BREAK | EXHIBIT HALL

4:00 PM - 4:30 PM

From the Flintstones to the Jetsons: How Transportation Affects the Protection of Roadway Workers

Cindy Williams, ATSSA; Sarah Stillman, ATSSA

Safety has become quite the buzz word in our industry. Daily, we place our employees and ourselves in the line of danger by “playing” in traffic. Let’s take a look at where we were, where we are, and where we are headed in an attempt to save lives on our roadways.

4:30 PM - 5:30 PM

Safety Advances for Roadway Workers Panel moderated by Deric Wyatt

Spencer Stillman, Time Striping; Matt Emberton, ARDOT; Eddie Tanner, ARDOT

Overview of safety initiatives implemented at ARDOT in the last year. This will include a panel discussion with ARDOT and Industry personnel. Panelists will give an overview of recent safety improvements in their areas/company and how the use of new technology has improved safety within their respective organizations.

SESSION DETAILS

WEDNESDAY, MAY 22

WEDNESDAY

SAFE SYSTEMS PLANNING AND OPERATIONS | ROOM 207

Moderator - Adnan Qazi

8:00 AM - 8:30 AM

Lighting in the Balance: The Highs and Lows Roadway Lighting

Ronald Gibbons, VTTI

This presentation considers the impact of roadway lighting on users and the environment. Looking at the positives of lighting and safety and the negatives of lighting, health and the environment, the approaches needed to balance these issues is considered.

8:30 AM - 9:00 AM

2024 Solar Eclipse Traffic Management Plan

Nicci Tiner, Garver

The State of Arkansas experienced a total solar eclipse on April 8, 2024. Up to 1.5 million visitors were expected to travel to view the solar eclipse, making this the largest tourism event in Arkansas history. The Traffic Management Plan (TMP) was used as a guide to help public officials and various agencies prepare for and manage the expected increase in traffic volumes leading up to, during, and after the Eclipse.

9:00 AM - 9:30 AM

Four Minutes of Darkness, Lessons Learned from the 2024 Solar Eclipse

Michael Kelly, ARDOT

A total Solar Eclipse occurred on April 8th, 2024. ARDOT prepared for this event for over 2 years with transportation planning, operations, and public information campaigns. We will be discussing lessons we learned before the next eclipse in 2045!

9:30 AM - 10:00 AM

BREAK | EXHIBIT HALL

10:00 AM - 10:30 AM

The Safe Systems Pyramid: A New Framework For Traffic Safety

Rachael Thompson Panik, Georgia Institute of Technology

The U.S. is embracing new paradigms of traffic safety (i.e., Vision Zero, Safe Systems), but it is often unclear how to prioritize safety countermeasures and programs within these new paradigms. What projects and actions will most effectively reduce injuries and fatalities given limited resources? Informed by public health thinking, the Safe Systems Pyramid gives planners and engineers a framework that identifies which solutions will make the largest population impact and reduce total system risk for all travelers.

<p>10:30 AM - 11:00 AM</p>	<p>A Crash Course on Arkansas' Data Anthony Dao, ARDOT</p> <p><i>Do you know how various crash statistics are generated? This presentation will take a look at how crash data is collected, managed, and analyzed. We'll explore current limitations on crash analysis and look at the future direction of crash reporting with the upcoming Uniform Crash Report update. To conclude, a demonstration of the publicly available Arkansas Crash Analytics Tool (ACAT) will showcase how you can visualize crash data.</i></p>
<p>11:00 AM - 11:30 AM</p>	<p>Stuck No More! ARDOT's Incident Management On I-40 Edward Holcomb, Garver; Nicci Tiner, Garver</p> <p><i>ARDOT is constructing traffic management improvements along the I-40 corridor from Central Arkansas to West Memphis. The project includes plans for alternative routing on Hwy 70 to keep traffic moving in the event of a major incident on I-40 using new technology, such as message signs, cameras, wrong-way detections, signal modifications, and way finding signs. The new technology will provide improved guidance and traffic flow during a closure of I-40. This project focuses on operational changes to improve traffic management, rather than physical improvements to the highways. Come hear how the design and planning for these operational changes resulted in the project under construction!</i></p>
<p>11:30 AM - 12:00 PM</p>	<p>Road Safety Audits Walt Catlett, Catlett Engineering</p> <p><i>Road Safety Audits (RSA) provide an additional tool for roadway safety analysis. These are a formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team. The team may include safety, operations, maintenance, and law enforcement officials. RSAs help answer what elements of the road may present a safety concern and, to what extent, to which road users, and under what circumstances. RSAs are a very low-cost countermeasure. The use of RSAs is increasing across the United States, in part due to crash reductions of up to sixty percent in locations where they have been applied.</i></p>
<p>12:00 PM - 1:30 PM</p>	<p>LUNCH EXHIBIT HALL</p>
<p>1:00 PM - 1:30 PM</p>	<p>POSTER SESSION EXHIBIT HALL</p>

1:30 PM - 2:00 PM

Making Work Zones Safer

Henry Brown, University of MO, Columbia

This presentation will provide an overview of ongoing and completed research projects on work zone safety and will showcase the use of innovative technologies to improve work zone safety. Example projects that will be highlighted include an evaluation of a Leader-Follower Truck Mounted Attenuator system, the use of virtual reality for work zone training, and an NCHRP synthesis on state DOT practices for using smart work zone technologies to improve work zone safety.

2:00 PM - 2:30 PM

Traffic Incident Management and TIM Training Facility

Lieutenant Brad Perkins, AHP

This presentation will explain what the Traffic Incident Management (TIM) Program is and how it has progressed in traffic management at crash sites and how it has reduced the secondary crashes. This presentation will also highlight the new TIM Training Facility that was built in North Little Rock at Camp Robinson.

2:30 PM - 3:00 PM

TSMO Safety Innovation at ARDOT

Hussain Alfaraj, ARDOT

This session will cover the safety innovation solutions that Transportation Systems Management and Operations (TSMO) Division provides to improve safety and mobility for the traveling public and ARDOT Employees. This session will give an overlook of the modern solutions that increase reliability and efficiency of the Arkansas highway system.

3:00 PM - 3:30 PM

BREAK | EXHIBIT HALL

3:30 PM - 4:00 PM

Safety Assessment For Every Roadway (SAFER)

Katy Harlan, MODOT

This will be an overview of the Missouri Department of Transportation's Safety Assessment For Every Roadway (SAFER) program. The presentation will discuss how the Safe Systems Approach is incorporated into program delivery and how the SAFER program has evolved from the initial goal of safety on every project to now also quantifying those safety benefits.

4:00 PM - 4:30 PM

High Crash Work-Zones

Tyrone Dillard, AHP

This presentation will be over the cameras within our I-30 work zone, given the general public of how the camera system works. This will include the updated laws regarding cell phones and the Arkansas left lane Violations.

<p>4:30 PM - 5:00 PM</p>	<p>Charting a Course to Safer Streets: Fayetteville's \$25 Million Safe Streets 4 All Initiative</p> <p>Dane Eifling, City of Fayetteville; Chris Brown, City of Fayetteville; Matt Mihalevich, City of Fayetteville</p> <p><i>Dive into the process behind securing the \$25 million award through the Safe Streets and Roads for All (SS4A) program, as Fayetteville charts a path towards safer streets. Explore Fayetteville's Vision Zero Safety Action Plan and the five projects identified on the high injury network slated for improvement using FHWA-endorsed proven safety countermeasures.</i></p>
<p>5:00 PM - 5:30 PM</p>	<p>Right Vs Wrong: Reducing Wrong-Way Crashes In Arkansas Using Passive And Active Systems.</p> <p>Joe Hawkins, ARDOT</p> <p><i>Overview of ARDOT efforts to reduce Wrong Way Driving accidents. Updates on TRC2105 Wrong Way Detection Study and Job 012410 that is installing WWD in Central Arkansas and along I-40 East, and District efforts.</i></p>
<p>WEDNESDAY</p>	<p>TECHNOLOGY AND INNOVATION ROOM 209</p> <p>Moderator - Sharon Hawkins</p>
<p>8:00 AM - 8:30 AM</p>	<p>EnViewer to EnQuery: Seeing is Believing! Behind the Scenes of Arkansas Road Projects!</p> <p>Linda DeMasi, ARDOT; Marisol Filares, ARDOT; Robert Reed, ARDOT</p> <p><i>Federally funded road projects are required to go through regulatory to evaluate the environmental and related socioeconomic effects of proposed projects. EnQuery, formerly EnViewer, is a more robust and complete web-application curated for the Environmental Division to become a one-stop-shop of GIS resources to assist in the preliminary environmental review process for the Arkansas Department of Transportation. This application is primarily used as an information highway where specialists can collaborate, track, and increase transparency of potential impacts throughout the Environmental process. Future developments will include the ability for users to conduct routine geospatial analysis.</i></p>
<p>8:30 AM - 9:00 AM</p>	<p>Digital Engineering QC - A New Way</p> <p>Josh Kleitsch, Olsson</p> <p><i>How do you perform QC on a Model? As transportation industry stakeholders race into the Digital Delivery age, many consultants and owners are asking the question: How do we verify the 3D model being delivered is accurate, constructable, and validated?</i></p> <p><i>We will take advantage of features built into the OpenRoads designer software to create and export an IFC file and use that to perform Quality Control functions that a Project Manager or external stakeholder might want to do. In the process, we'll be demonstrating how to ensure our Digital Delivery ambitions can be realized without requiring everyone on a project to use the ORD software.</i></p>

Safety Analysis Process: Core Module #7

Walt Catlett, Catlett Engineering

9:00 AM - 9:30 AM

The safety analysis process, as part of the FHWA Safety Toolkit, is a systematic process for identifying the factors that can contribute to crashes and implementing effective countermeasures. It is a best practice method that is flexible and can be used to fit your needs. This workshop will cover the seven-step process and discuss how it can be applied using two different complementary analysis methods: the traditional site safety analysis and the systemic analysis. Additionally, case studies will be utilized to practice applying the process.

9:30 AM - 10:00 AM

BREAK | EXHIBIT HALL

10:00 AM - 10:30 AM

142+ Hours

Valarie Nichols, ARDOT; Kaili Teeter, ARDOT

A synopsis of ARDOT's Surveys UAV LiDAR from 2020-2024.

10:30 AM - 11:00 AM

What Can Right of Way Engineering Do For You?

Genevieve Haller, DeIDOT

Right of Way (ROW) Engineering is a relatively new term given to a group of tasks that address the gaps between Design and Real Estate teams. It may also identify a designated group within a DOT assigned to handle these duties. Regardless of the staff doing the work, if ROW Engineering is properly addressed throughout project delivery, DOTs can reasonably expect to move smoothly and efficiently through the submittal process. This session will provide an overview of ROW Engineering, note key findings from the Technical Council on ROW Engineering, and share simple steps that can be used at any DOT to improve current methods, including efforts geared toward unifying our processes at the national level.

11:00 AM - 11:30 AM

ARDOT Real-Time GNSS Network

Eric Benson, ARDOT

Using CORS (Continuously Operating Reference Stations) for Precision Surveying. Providing accurate corrections using a cellular modem to connect a user to a wide network of published monumentation.

Stuck in Traffic? We Know Why! A Look at ARDOT's Resources to Analyze Congestion on Arkansas' Highways?

Sharon Hawkins, ARDOT; Christopher Pipkin, ARDOT

11:30 AM - 12:00 PM

This presentation will take a look at some methods ARDOT uses to capture data on traffic congestion across the state, how that data is analyzed to determine projects needed, and how visualizing congestion with GIS and weather data can help pinpoint when things started backing up. We'll take you through how the public helps contribute to this data and how current/archived data is utilized to determine areas that have recurring congestion. Get ready to be interactive with us and discover the various ways to see congestion at ARDOT.

12:00 PM - 1:30 PM

LUNCH | EXHIBIT HALL

1:00 PM - 1:30 PM

POSTER SESSION | EXHIBIT HALL

WEDNESDAY

RESEARCH UPDATE | ROOM 209

Moderator - Sanghyun Chun, Ahmed Muftah

TRC2104 - Maintenance Guidelines for MSE Walls

Michelle Barry, UAF

1:30 PM - 2:00 PM

This presentation will discuss the findings from an ongoing study focused on the maintenance guidelines for mechanically stabilized earth (MSE) retaining walls. Researchers at the University of Arkansas have been working with ARDOT to develop best management practices and an inspection guidebook to assist personnel in performing routine inspections of MSE walls post-construction. Survey responses from 44 state DOTs will be discussed to highlight the most common issues maintenance personnel are finding at MSE walls across the country and in Arkansas specifically. Guidance has also been provided by MSE manufacturers and will be discussed along with the plan for implementation of the tool and inspection manual.

TRC2101 - Update of the ARDOT Workforce Forecasting System

Suman Mitra, UAF

2:00 PM - 2:30 PM

The objective of this project is to develop a process and tools that accurately estimate ARDOT construction staffing requirements for highway construction projects. The first three tasks have been completed, which involved reviewing existing literature and ARDOT state of practice (Task 1), identifying factors and data collection (Task 2), and developing a workforce forecasting model (Task 4). Task 4, which involves the development of the workforce forecasting tool, is ongoing, and significant sub-tasks have been accomplished.

TRC2102 - Effect of Asphalt-Binder Compatibility on Performance of Asphalt Mixtures in Arkansas

Zahid Hossain, ASU

2:30 PM - 3:00 PM

The primary objective of this collaborative study between A-State and UARK has been to find compatible aggregate-binder systems in mixtures for enhanced performance in the field. The goal of this study was accomplished by a through evaluations of asphalt binders, aggregates, binders and asphalt mixtures. Test data and analysis suggest that highly absorptive aggregates are discouraged to use in preparing surface mixtures. Further, the use of sandstones should be limited up to 60%.

3:00 PM - 3:30 PM

BREAK | EXHIBIT HALL

TRC2103 – Developing Guidelines for Evaluating Weathering Steel Bridges

Ernie Heymsfield, UAF

3:30 PM - 4:00 PM

Weathering steel enhances corrosion-resistant steel features over conventional steel when a patina properly forms on the weathering steel surface. However, long periods of moisture and/or deicing chemicals applied during wet wintry conditions can hinder proper patina formation. More than 25 ARDOT UWS bridges were visited during the study to examine bridge characteristics promoting oxide film degradation. An unmanned aircraft system (UAS) was used to help with the bridge inspections.

Similarities among the inspected bridges experiencing significant oxide film degradation include deteriorated and/or missing bridge deck compression strip seals, presence of vegetation near or in contact with the steel superstructure, and inadequate girder-water clearance. Remediation at bridges experiencing oxide film degradation include cleaning poor condition, (Condition State 3) and severe condition (Condition State 4) girder areas; clearing vegetation; and in certain cases, applying an extra protective coating such as paint or primer near problematic areas.

TRC2303 - Evaluation of Impacts Due to A Bridge Closure: A Case Study of the Mississippi River Bridges in Arkansas

Sarah Hernandez, UAF

4:00 PM - 4:30 PM

This presentation will discuss the methods selected to quantify the multi-modal traffic impacts resulting from bridge closure events through a case study of the Mississippi River bridges in Arkansas. Impacts will be measured and reported in terms of traffic volume, delay, and detour volumes, each disaggregated by passenger vehicle traffic, highway freight traffic, and waterway freight traffic. The study will develop a model for "what-if" analyses that will explore how investments and innovative strategies in operations, maintenance, and planning activities could reduce impacts of transportation infrastructure disruptions such as that caused by a bridge closure. In addition, the study will provide a historical documentation and information that ARDOT needs to come up with the situations of major transportation disruptions caused by a bridge closure.

TRC2203 - Low Shrinkage Concrete Mixtures for Arkansas

Shuyah Ouoba, UAF

4:30 PM - 5:00 PM

Transverse cracking affects the durability of concrete bridge decks and primarily results from drying shrinkage. Basic mixtures were prepared using the current Department of Transportation specified mixture proportions and different coarse aggregate types typically used in the state. These mixes were then optimized by adjusting the coarse aggregate gradation and reducing the cement content by 5.9% and 15.4%. Substitution with 20% and 30% Class C fly ash was also made. The fresh and hardened concrete properties, such as the drying shrinkage and electrical bulk resistivity, are tested and compared to evaluate any potential improvements.

TRC2204 - Materials Testing Specifications for Drilled Shaft Concrete

Cameron Murray, UAF

5:00 PM - 5:30 PM

This presentation will provide an overview of the ARDOT research project TRC2204. This project attempts to illustrate the advantages of using self-consolidating concrete (SCC) in concrete placements with heavily congested reinforcement such as drilled shafts. The presentation will cover mixture design and properties, and the performance of scaled drilled shaft cross sections made with conventional concrete and SCC placed underwater and in a dry condition.

SESSION DETAILS

THURSDAY, MAY 23

THURSDAY

BRIDGE TECH | ROOM 207

Moderator - Mark Simecek

8:00 AM - 8:30 AM

ARDOT's New Bridge Inspection Technology

Caleb Lambert, ARDOT; Jake Norris, ARDOT

Did you know that ARDOT bridge inspection has the largest fleet of drones within the department? Does this surprise you? Does this make you wonder why the heck bridge inspectors even need drones? Taking a step further, did you know that Bridge Operations also has a mobile LiDAR unit?

During this presentation, Jake and Caleb will talk about the new technology that is utilized within bridge inspection to help ensure safety of the traveling public and the inspectors. Be there or be square!

8:30 AM - 9:00 AM

Why Bridge Load Ratings are Important

Tim Armbrecht, Michael Baker Intl.

This presentation will outline the reasons state agencies are required to perform load ratings and the practical issues state DOTs face when a low load rating results in a potential posting. It will examine: 1) the legal requirements, including the origins in the Code of Federal Regulations and the Manual for Bridge Evaluation, 2) the 23 metrics with an emphasis on the load rating metric, and the standard at which the state DOTs are being assessed, 3) the DOT point-of-view, exploring the issues and situations they face while determining load ratings and issuing load postings, and 4) the presenter's own insight and experience as to what helps build a successful relationship between consultant and DOT while working on a bridge load rating project.

9:00 AM - 9:30 AM

Rehabilitation of the Garrison Avenue Bridge in Fort Smith, Arkansas

Ed Liberati, Hydro-Technologies

During the 2023 and 2024 construction seasons, the Garrison Avenue Bridge (HWY 64 over the Arkansas River in Fort Smith) underwent a major bridge deck rehabilitation project. The major work items for the project were bridge deck surface preparation using Hydrodemolition Class 1 and the installation of a new Latex Modified Concrete Overlay (1-1/2" thick). This presentation will discuss the history of the 100 year old bridge and the 60+ year history of LMC Overlays. Also included will be a discussion on the science of Hydrodemolition. The actual bridge deck preservation construction work items will also be discussed utilizing details, pictures and a video of the project.

9:30 AM - 10:00 AM

BREAK | EXHIBIT HALL

Utilizing Contractual BIM in your Structures Workflow, Design to Construction

Daniel Jensen, Michael Baker Intl.

Many state organizations are using smart 3D models to replace the 2D contractual documents and provide a deeper understanding of design intent. Additionally, they have helped with minimizing construction issues by having better constructability understanding in the design and letting process. This presentation will cover an overview of how you can utilize BIM and 3D models in your project delivery workflow. The attendee will see project examples from across the country which are currently using 3D models in the design, letting and construction process giving you ideas on how you can implement this advanced process into your future projects. Resources from specific states as well as FHWA will be provided to ensure your success moving forward.

10:00 AM - 10:30 AM

TRC1903 - Investigating Concrete Deck Cracking in Continuous Steel Bridges

Ernie Heymsfield, UAF

Bridge deck cracking reduces the serviceability and lifespan of bridges. ARDOT has identified a disproportionate number of continuous steel girder bridges experiencing early age bridge deck cracking that were constructed using a continuous deck pour.

For this study, early age bridge deck cracking was conducted by monitoring the induced concrete tensile stresses during the construction process and comparing these values with the concrete's concurrent tensile strength. Two continuous deck pour bridges were instrumented to measure strains during: deck construction, concrete hardening, cooling, and densification stages. In addition, finite element bridge models were developed to analyze the problem.

To remedy conditions related to early age deck cracking, ARDOT should require contractors to use appropriate curing methods: moist curing and protecting the concrete from moisture loss until the concrete deck has gained sufficient tensile strength (generally 7-14 days).

10:30 AM - 11:00 AM

<p>11:00 AM - 11:30 AM</p>	<p>A View From Below: The ARDOT Dive Team Initiative Nate Brown, ARDOT; Tori Elliott, ARDOT</p> <p><i>Did you know ARDOT has a Dive Inspection Team? Since 2022, Bridge Operations Division has certified 18 divers, completed over 90 underwater bridge inspections, and reduced inspection costs drastically. Listen to two of Bridge Operation's engineers explain the process of implementing a scuba diving team, from initial idea to performing complete underwater inspections. Join us as we take a dive below the surface of the ARDOT Underwater Bridge Inspection Program.</i></p>
<p>11:30 AM - 12:00 PM</p>	<p>wikiHow to Repair a Bridge in Arkansas? Kevin Weston, ARDOT</p> <p><i>Are you a DIYer and want to repair a bridge near you? If so, this is for you! This talk will show and describe a high level of all things related to repairing the bridges that ARDOT maintains from an internal perspective. We will start with the most common repairs that you can expect to see in the life of a bridge structure and progress to the more complex, unique, and challenging repairs ARDOT has faced. All bridge enthusiasts are welcome to join in; you will not want to miss this!</i></p>
<p>THURSDAY</p>	<p>INFRASTRUCTURE MATERIALS ROOM 207 Moderator - Paul Tinsley</p>
<p>8:00 AM - 8:30 AM</p>	<p>FHWA - Mobile Asphalt Technology Center Michael Huner, FHWA</p> <p><i>Overview of the recent 4-week onsite visit of the FHWA's Mobile Asphalt Technology Center to Arkansas to support ARDOT with sampling and testing of its first "BMD designed" project mixture.</i></p>
<p>8:30 AM - 9:00 AM</p>	<p>Effect of Lag and Dwell Time on Balanced Mix Design Testing Ram Veeraraghavan, FHWA</p> <p><i>Highlight the impact of Dwell (Duration between asphalt mixture compaction and mechanical testing) and Lag time (Duration between asphalt mixture sampling and sample compaction) on the BMD test results.</i></p>
<p>9:00 AM - 9:30 AM</p>	<p>Partnering Pavement Performance Tisha Reynolds, ARDOT</p> <p><i>Partnerships are formed as ARDOT, FHWA, Industry and Academia look at moving from Superpave to Balanced Mix Designs. Balanced mix designs are opening the door to utilizing innovative materials and technologies to design asphalt pavements while providing agencies with a more reliable way to accept mixtures. A review of the technologies provided by the FHWA Mobile Asphalt Technology Center during their visit to Arkansas will be discussed.</i></p>

9:30 AM - 10:00 AM	BREAK EXHIBIT HALL
10:00 AM - 10:30 AM	<p>New Friction/Polishing Test for Asphalt Mixtures Wade Collins, Pavement Technology Inc.</p> <p><i>Background on surface friction basics along with new ways to test friction properties in the laboratory. Will share test method information and test results that were obtained utilizing loaded wheel testing.</i></p>
10:30 AM - 11:00 AM	<p>Earthquake-Induced Soil Liquefaction and Transportation Structures David Baska, Terracon</p> <p><i>Liquefaction has been one of the most significant causes of damage to transportation structures during past earthquakes. Liquefaction can damage structures in many ways including increased lateral loading on deep foundations, bearing failure of embankments, and ground settlement. Liquefaction refers to the significant loss of strength and stiffness resulting from the generation of excess pore water pressure in saturated, predominantly cohesionless soils. The potential effects of strength loss and settlement include slope instability due to flow failure and lateral spreading, reduced foundation bearing resistance, and reduced soil stiffness and loss of lateral support for deep foundations. The presentation will cover liquefaction hazard evaluation and geo-technical design parameters for structural design.</i></p>
11:00 AM - 11:30 AM	<p>Understanding Alkali-Silica Reaction Susceptibility of Aggregates Used in Concrete Chandni Balachandran, FHWA</p> <p><i>Alkali-Silica Reaction (ASR) is one of the main degradation mechanisms affecting the service life of concrete infrastructure. Several accelerated test methods to evaluate the ASR susceptibility of aggregates are available, some more effective than others. Extrapolating the presence of ASR phases in an aggregate as detected by an accelerated test to field performance is not ideal. Taking the alkali threshold of an aggregate into consideration provides a more comprehensive understanding of its ASR susceptibility when used in concrete. Understanding all the factors that influence the ASR performance of aggregates in concrete is key to the development of effective ASR management guidelines.</i></p>

Practical Applications of the TFHRC ASR Management Tools

Jose Muñoz, FHWA

11:30 AM - 12:00 PM

The TFHRC ASR Management toolkit comprises of three novel accelerated tests that cover all important factors key to understanding the ASR susceptibility of aggregates in concrete. The AASHTO TP 144 test (T-FAST) detects the presence of alkali-silica reactive phases in the aggregates. The Alkali Threshold Test (ATT), recently balloted by AASHTO, provides valuable information regarding ASR field performance of aggregates in concrete. The Job Mix Test (JMT), currently under development, can be used to evaluate the ASR susceptibility any type of concrete mix design. These new tools can be used to design prescriptive and performance-based approaches to eliminate ASR risk of aggregates commonly used in concrete production.

WHO'S WHO SPEAKERS



Hussain Alfaraj, P.E.

**Staff Engineer
ARDOT**

Hussain's career with ARDOT began in summer of 2013 after graduating with an Electrical Systems Engineering degree from the University of Arkansas at Little Rock. Hussain is a Registered Professional Engineer. Hussain's expertise is in Transportation Systems Management and Operations (TSMO), Intelligent Transportation Systems (ITS), and Roadway Illumination. He assists in overseeing the implementation and operation of technology on the highway system within Arkansas.



Tim Armbrrecht, P.E., S.E.

**Sr. Bridge Technical Manager
Michael Baker International**

Tim has been with Michael Baker since 2022, after serving over 30 years with the Illinois Department of Transportation in the Bureau of Bridges and Structures. He retired from IDOT as the Engineer of Structural Services, in which he managed the state's existing bridge inventory and led the charge to update all bridge models to AASHTOWare BrR. Tim has served as Chair of the AASHTOWare BrR Task Force as well as Vice-Chair on the AASHTO Special Committee on AASHTOWare. He also served 11 years on the AASHTO Committee on Bridges and Structures, including 10 years on the Technical Committee T-18, which reviews and updates the load rating specifications, i.e., AASHTO Manual for Bridge Evaluation, to which he contributed numerous changes.



Chandni Balachandran

**Chemistry Laboratory Manager
Genex Systems**

Chandni Balachandran works with Genex Systems as a Research Chemist and the Chemistry Laboratory Manager at

Turner-Fairbank Highway Research Center. Her research interests include concrete degradation mechanisms such as alkali-silica reaction, application of spectroscopic techniques and microscopy to investigate the same and the development of new accelerated test methods to detect alkali silica reactivity in aggregates and manage ASR risk in the field.



Dr. Michelle Barry, Ph.D., P.E.

**Associate Professor
University of Arkansas**

Michelle Barry is an Associate Professor in the Department of Civil Engineering at the University of Arkansas. She received her B.S., M.S., and Ph.D. in Civil Engineering from Texas A&M University in 2008, 2009, and 2013, respectively. Her research interests include the multi-scale characterization of particulate materials using experimental testing and computational modeling. Her research has been applied to particle shape characterization, levee erosion, levee assessment and performance, fouled ballast behavior, MSE wall performance, and large-scale direct shear and direct simple shear testing. A large portion of Dr. Barry's ongoing research focuses on the development of additive manufacturing materials and processes for the construction of civil infrastructure. Dr. Barry is a licensed professional engineer in the state of Arkansas.



Dr. David Baska, P.E., G.E., R.G., C.E.G.

**Senior Engineering Consultant
Terracon Consultants, Inc.**

Dave Baska has been a practicing geotechnical engineer since graduating from the Colorado School of Mines in 1984. Dr. Baska's interest in earthquake engineering was sparked by Professor H. Bolton Seed while earning his Master of Science degree

from UC Berkeley in 1988. Dave completed his doctoral program at the University of Washington twenty years ago and is an Affiliate Associate Professor in the Department of Civil and Environmental Engineering at the UW. Dave joined reconnaissance teams to Chile in 2010 and Christchurch, New Zealand in 2011 following damaging earthquakes in those countries. As Terracon's senior geotechnical earthquake engineer, Dave has participated in more than 100 transportation-related projects including many impacted by the New Madrid Seismic Zone.



Eric Benson
Geodetic Surveys Coordinator
ARDOT

Eric Benson is the Geodetic Surveys Coordinator at the Arkansas Department of Transportation, working to provide the surveying community with accurate and reliable data. He graduated from the University of Arkansas Community College Morrilton in 2009. Before his current position with ARDOT, he worked on a survey field crew for both the department and the private sector, where he developed a desire to work hard and contribute to the surveying/engineering community and general public.



Henry Brown
Research Engineer
University of Missouri

Henry Brown is a Research Engineer at the University of Missouri where he works on projects in a variety of areas such as work zones, innovative geometric designs, transportation safety, and asset management. He also teaches the Capstone course. Prior to moving to Missouri in 2012, he obtained his Bachelor's and Master's degrees from Purdue and worked for 14 years as a Highway Engineer at the Indiana Department of Transportation. He is a registered Professional Engineer in both Indiana and Missouri.



Nate Brown
Advanced Bridge Operations
Engineer
ARDOT

Nate is an engineer with the Bridge Operations Division at the Arkansas Department of Transportation. He has been with the Department for 2 years. Prior to coming to Arkansas, Nate spent time with the Missouri Department of Transportation in the construction field. Nate specializes in bridge inspection and bridge maintenance repair design. He is a graduate of Missouri University of Science and Technology.



Walt Catlett
President
Catlett Engineering

Walt Catlett possesses over 30 years of experience in urban drainage design, combined with over 30 years of safety experience. He serves as the Safety Circuit Rider for the National Center for Rural Road Safety. He helps manage Virginia's Safety Circuit Rider Program. He is the State Director for the Arkansas Concrete Pipe Association. He also serves as the State Engineer for the Texas and Oklahoma Concrete Pipe Associations. He serves on ARDOT's TRC Advisory Council. He has a B.S. in Civil Engineering from Texas A&M University and a Master of Strategic Studies from the U.S. Army War College. Mr. Catlett served in the United States Marine Corps and United States Army Reserves for a combined 30 years.



Wade Collins
President
PTI

Mr. Wade Collins has been a part of Pavement Technology Inc (PTI) since its beginning in 1996. He was fortunate to work closely with two pioneers in our industry-Dr. Don Brock-Founder of ASTEC Industries and Ronald Collins-Former State Materials and Research Engineer with Georgia DOT. Wade enjoys developing and implementing sampling and testing equipment for the Hot Mix Asphalt Industry. He believes three keys to happiness in life is finding balance in

all aspects of your life, helping people, and having a can do attitude. He loves College Football especially the University of Georgia Bulldogs. Go Dawgs.



Anthony Dao

**Sr. Traffic Safety Analyst
ARDOT**

Anthony is the Senior Traffic Safety Analyst with the Planning Division at the Arkansas Department of Transportation (ARDOT). His team leads the State's efforts on crash data management in coordination with the Arkansas State Police. Anthony enjoys analyzing and visualizing data to inform and improve traffic safety strategies and operations.



Linda DeMasi

**Section Head - GIS & Data
Management
ARDOT**

Linda DeMasi began her career with the Arkansas Department and Transportation in 2001 following graduation from the University of Central Arkansas with a bachelor's degree in Geography and History. She also holds a bachelor's degree in Psychology and a master's degree, with an emphasis in GIS, in Community and Economic Development. Linda is a certified Geographic Information Professional (GISP). During her 22-year tenure, Linda has held several positions - currently as the Section Head of GIS & Data Management in the Environmental Division. Linda loves baseball, reading, and travel. She also enjoys helping others strengthen their skills in GIS by mentoring and serving as an Adjunct Professor in the MGIS program at UCA.



Tyrone Dillard

**Lieutenant
Arkansas Highway Police**

Tyrone Dillard is employed with the Arkansas Highway Police going on 11 years with 21 years of Law Enforcement experience. His current position is the Lieutenant over the department Heat Team / Drug Interdiction & Human

Trafficking Team assigned under the Special service division for the department. Tyrone's team consists of six officers and one Sergeant who travel across the State of Arkansas and work within high crash work zones.



Dane Eifling

**Mobility Coordinator
City of Fayetteville Arkansas**

Dane began his work at the City of Fayetteville in 2014 through an AmeriCorps position as the City's first Bicycle Coordinator. From 2018-2020 Dane served in a joint role as the Bike and Pedestrian Programs Coordinator for the City of Fayetteville and the University of Arkansas. In his current role as Mobility Coordinator Dane oversees the City's management of micromobility, traffic calming and Vision Zero planning and strategy efforts. Dane is a Fayetteville native, a Navy veteran, avid bike commuter and has a BA in Human Geography from San Francisco State University.



Victoria Elliott

**Advanced Engineer
ARDOT**

Victoria has worked for Bridge Operations for almost 3 years, helping manage the dive and sonar team. She also serves as chairman of the Bridge Inspection Program Scour Committee. She is originally from Louisiana and got her Bachelor of Science in Civil Engineering from Louisiana Tech University in 2021.



Marisol Filares

**GIS/Data Management Specialist
ARDOT**

Marisol Filares is a geographer currently working at ARDOT's Environmental Division as a GIS/Data Management Specialist. Marisol holds a Bachelor of Science Degree in Geography with a Geospatial Technology Concentration and minor in Biology from the University of Central Arkansas. Marisol strives to maximize the utility and value of geospatial data by making it easier to create, collect, discover, access, analyze, integrate, and exchange information. Marisol's role

during the preliminary stage of construction involves environmental analysis, creating maps/figures, sharing, and collaborating spatial data, and public information delivery of proposed road projects. She also enjoys assisting other environmental specialists whether its entering culverts for bat monitoring, conducting shovel tests, relocating crayfish or restoration efforts for ARDOT's mitigation sites.



Dr. Ronald Gibbons, FIES
Program Director, Infrastructure Based Safety Systems
Virginia Tech Transportation Institute

Ron Gibbons is the Associate Professor in the School of Architecture and Design at Virginia Tech. and the Director of the Infrastructure Based Safety Systems Laboratory at the Virginia Tech Transportation Institute (VTI). He is the Institute's lead lighting research scientist. He is currently the PI on projects investigating the impact of outdoor lighting on human health, the Spectral Effects of new light sources on roadways, the application of smart lighting to roadways and is the subject matter lead for the FHWA office Safety IDIQ contract.



Genevieve Haller
Project Manager, Right-of-Way Engineering
Delaware Department of Transportation

Genevieve Haller has worked in the civil engineering industry for over 30 years, focusing on Transportation, Survey, and Land Development. In the consultant world she managed DOT, municipal, and commercial/residential projects. At the Delaware Department of Transportation (DelDOT), Genevieve is a Project Manager for Right of Way (ROW) Engineering. She contributed to DelDOT's ROW Engineering Manual and participated in developing ROW-related state legislation. Genevieve is founding chair of AASHTO's Technical Council (TC) on ROW Engineering. She oversaw creation and development of ROW Engineering Essentials, an

AASHTO Technical Training Solutions course. Through the TC Genevieve is spearheading national research projects which will lead to new ROW Engineering content in AASHTO's A Policy on Geometric Design of Highways and Streets.



Katy Harlan, P.E.
Traffic Safety Engineer
Missouri DOT

Katy has been with the Missouri DOT since 2018 and, in her current role, oversees the Highway Safety Improvement Program, assists in crash data analysis, and is the statewide contact for the Safety Assessment For Every Roadway (SAFER) program. Katy holds a Bachelor of Science in Civil Engineering from the University of Missouri-Columbia, as well as a Masters in Business Administration with an emphasis in Management from Northwest Missouri State University and is a licensed Professional Engineer with the State of Missouri.



Joseph Hawkins
State ITS Engineer
ARDOT

Joe Hawkins has been with the Department for 16 years. He has fun working with the Transportation Systems Management & Operations (TSMO) teams: Traffic Management Center (TMC), Traffic Signal Operations, Intelligent Transportation Systems (ITS), Roadway Lighting, Land Mobile Radio (LMR) & wireless network backhaul. Several recent notable TSMO FUN Lab projects include; Mobile ITS cameras for live streaming video for Snow Plows and Motorist Assistance Patrols, UAS (drone) live video feeds to ACTIS for First Responder support.



Sharon Hawkins
Staff GIS and Mapping Administrator
ARDOT

Sharon is a 1999 graduate from the University of Central Arkansas' Geography Program. She has been in the GIS & Mapping Section within the ARDOT Planning Division for 25 years and enjoys making maps, analyzing

data, solving spatial problems, and working with her co-workers across the agency. She has served on the AASHTO GIS-T Taskforce and on the Arkansas State GIS Board. Ask Sharon about the Arkansas State Highway Map, County and City Maps, ARNOLD, GIS, and anything ARDOT spatial data related - she'd love to talk with you about it!



Dr. Sarah Hernandez, P.E.
Associate Professor
University of Arkansas

Sarah Hernandez is an Associate Professor and Walter E. Hicks and Blossom Russell Hicks Endowed Chair for Infrastructure Engineering at the University of Arkansas. She received her MS and PhD in Civil and Environmental Engineering with a specialization in transportation systems engineering from the University of California, Irvine. She is the faculty advisor for the student chapter of the Institute of Transportation Engineers (ITE) and a member of ITE. Her research focuses on new and advanced technology applications in transportation systems engineering and is centered on developing tools and methods to collect and analyze freight and commercial vehicle operations data for long range freight planning. She serves as Chair of the Transportation Research Board's Standing Committee on Freight Transportation Data.



Dr. Ernie Heymsfield
Associate Professor
University of Arkansas

Dr. Ernie Heymsfield is an Associate Professor at the University of Arkansas Department of Civil Engineering. His expertise is in structural engineering and numerical modeling. His research includes numerical modeling, bridge engineering, wood engineering, and airfield pavement performance. His recent research work includes, early age concrete deck cracking, corrosion at weathering steel bridges and wood engineering. He is a licensed professional engineer, a former president of the ASCE Transportation and Development Institute Board of Governors, and former chair of the Transportation

Research Board's Aircraft / Airport Compatibility Committee (AV070).



Vivien Hoang, P.E.
Division Administrator
Federal Highway Administration

In March 2020, Vivien Hoang became the FHWA Arkansas Division Administrator. She began her FHWA career in 2008 and has served in the Colorado, New Mexico, and California Division Offices as well as in the Office of the Administrator at FHWA Headquarters. Prior to joining FHWA, Vivien worked in the private sector as a roadway and drainage design engineer. Vivien holds a Bachelor of Science in Civil Engineering from the University of Florida and is a licensed Professional Engineer in the State of Florida.



Dr. Zahid Hossain
Professor
Arkansas State University

Dr. Hossain has served as a Professor of Civil Engineering at Arkansas State University. His research focuses on sustainable use paving materials for longer lasting pavements. Dr. Hossain is a Professional Engineer in the state of Arkansas. He is an ASCE Fellow.



Michael Huner, M.S.C.E., P.E.
Project Manager
FHWA - Mobile Asphalt Technology Center

Mike has worked for over 28 years in various aspects of the asphalt industry, ranging from Research & Testing to Field Engineering to Technical Services. He began his professional career at the National Center for Asphalt Technology, as a Laboratory Engineer, Laboratory Manager, and a Research Engineer. Mike spent the next five years as a Field Engineer for the Asphalt Institute, and then five years as the Technical Services Director for the Tennessee Road Builders Association. Along with his consulting, Mike is currently serving as the Project Manager for FHWA's Mobile Asphalt Technology Center (MATC). He holds both a bachelor's and a master's in Civil Engineering from Auburn

University and is a registered professional engineer in both Alabama and Tennessee.



Daniel Jensen

Regional Technical Manager - BIM for Bridges
Michael Baker International

Daniel has a myriad of experience in the structures transportation industry gaining knowledge in various project delivery types. Mr. Jensen is leading the effort in outlining and creating various Digital Delivery networks across the country. His involvement in various Digital Delivery projects in Utah, Texas, Michigan, and Minnesota has given him extensive knowledge in how to effectively deliver model-centric documents to ensure all parties involved receive the information required. Mr. Jensen worked directly with UDOT and currently with TxDOT to build their standards and processes as well as guides to assist future structure designers. He is also involved in pilot and program development projects with other DOT's to implement Digital Delivery workflows tailored to their own standards and guidelines.



Michael Kelly, P.E., P.S.

Staff Maintenance Engineer
ARDOT

Michael Kelly is a Staff Engineer in the Maintenance Division at the Arkansas Department of Transportation (ARDOT). He is the primary Emergency Management Liaison Officer (EMLO) to the Arkansas Division of Emergency Management. As the EMLO for ARDOT, Michael coordinates assistance for disasters in the Emergency Support Function ESF-1 Transportation and the ESF-3 Public Works & Engineering roles. Michael also oversees the department's statewide Pavement Marking program. Michael began his career at the department with the Surveys Division in May 2002, transferred to the System Information and Research Division in October 2014, and Maintenance Division in March 2017. Michael holds a Bachelor of Science in Civil Engineering from Louisiana Tech University. He is a licensed Professional Engineer and Professional Surveyor.



Joshua Kleitsch, P.E.

Technical Expert - Transportation
Olsson

Josh is a Transportation Engineer with a passion for elevating the use of digital tools in the design and construction industry. He has experience delivering large, multi-disciplinary projects in both the Autodesk and Bentley environments, with one notable project being the Peña Blvd Widening at Denver International Airport. His recent work has included training and equipping engineers and designers across the nation to use their design tools wisely, first by testing and validating Best Practices, and then setting up support systems to ensure everyone has the support they need to succeed.



Caleb Lambert

Bridge Management Analyst
ARDOT

Caleb Lambert is a Bridge Management Analyst for the Bridge Operations Division at ARDOT. He began his career in 2017 as an Electronics Technician for Traffic Services working on Weigh-In-Motion and Pavement Analysis equipment. He then advanced to ITS Specialist for Communications, now TSMO, where he installed and maintained the State's ITS infrastructure including PTZ cameras and Dynamic Message Signs. In 2023, he moved to Bridge Operations where he helps manage and analyze ARDOT's bridge inspection data. During his time with Bridge Operations, he has continued his technology path by helping maintain the fleet of drones used for bridge inspection, as well as using LIDAR technology to collect bridge under clearances.



Edward Liberati

Hydro-Technologies / Modified Concrete Suppliers

Edward's education consists of a Civil Engineering Degree from Youngstown State University and an Advanced Professional Degree in Civil Engineering from Ohio State University. His previous employment was with the Ohio Department of Transportation and Complete General Construction

Company. For the past 20 years, his role has been the Specialty Group Engineer for Hydro-Technologies and Modified Concrete Suppliers. The company specializes in the installation of LMC Overlays throughout the United States.



Stephen Maher, B.S., M.S.E., P.E.

Advisor

Transportation Research Board of The National Academies of Sciences, Engineering, and Medicine

Stephen joined the TRB staff in June of 1993 as a Senior Program Officer for the NCHRP Synthesis Studies Program, becoming the manager in 1998. In 2001 he promoted to the Engineer of Design position in the Technical Activities Division (TAD). In this position he supported the activity of highway, pavement, and bridge design committees. He also provided leadership for TAD as an Associate Division Director (2016-2021) and more in depth as the Deputy Director (2021-2024). Prior to joining TRB, he worked in the private sector as a geotechnical engineer for 10 years. Stephen graduated with a BS in Geology from James Madison University and a MS in Engineering from Purdue University. He is a registered professional engineer in Virginia.



Matt Mihalevich

City of Fayetteville - Active Transportation Manager
City of Fayetteville

Matt has been with the City of Fayetteville, Arkansas for the past nineteen years and is responsible for all aspects of the development of the trail system including; planning, funding, design, property acquisition, construction management, maintenance and public outreach.



Dr. Suman Mitra

Assistant Professor
University of Arkansas

Dr. Suman Kumar Mitra is an Assistant Professor in the Department of Civil Engineering at the University of Arkansas, Fayetteville. His primary research interests

include next generation transportation systems, travel behavior analysis of special population groups, sustainable transportation, travel demand modeling, and transportation safety. Dr. Mitra's research demonstrates how effectively transportation engineering can draw upon the strengths of a broad range of disciplines to inform smart-city solutions. He is a member of the Transportation Research Board Standing Committee on Travel Survey Methods.



Dr. Jose Muñoz Campos

Research Chemist FHWA
Turner-Fairbank Highway Research Center

Jose Muñoz Campos is a Researcher Chemist at Turner-Fairbank Highway Research Center. His research interests include the application of nano additives to engineer the structure of cementitious materials and the development of new and rapid test methods to identify aggregates that cause alkali-silica reaction in concrete.



Dr. Cameron Murray

Associate Professor
University of Arkansas

Cameron Murray is an associate professor in the University of Arkansas Department of Civil Engineering. He earned his Ph.D at the University of Oklahoma in 2017 and his BS and MS at the University of Arkansas in 2012 and 2014, respectively. His research interests are rapid setting concrete, prestressed concrete, and concrete mix design. He is active in the American Concrete Institute.



Valarie Nichols

Advanced Photo Tech
ARDOT

As an Avd. Photogrammetry Technician Valarie plans, acquires and processes ARDOT's survey aerial missions. Nichols has spent her 15-year career in Surveys where she was hired in 2008 as an aerial reproduction specialist, then promoted to Aerial Photographer, and in 2020 she obtained her UAV pilot license and began operating the department's LiDAR UAV. On days ARDOT

doesn't fly she can be found maintaining the Department's historical aerial photo library.



Jake Norris

**Bridge Management Section Head
ARDOT**

Jake started with the department in 2018 with TPP GIS and Mapping. In 2021, he transferred to Bridge Management as the Asst Section Head until 2023 where he was promoted to Section Head. During his time within bridge management, Jake has managed the bridge inspection UAS fleet as well as several other duties to include the occasional under water bridge inspection. Jake has 2 wonderful, yet handful, kids as well as a beautiful wife that is out of his league (Don't tell her that). Outside of work hours he enjoys spending time with his family and serving his community by being a volunteer firefighter as well as serving at his church.



Shuyah Ouoba

**Ph.D. Student
University of Arkansas**

Shuyah Ouoba earned a Bachelor of Science in Water and Environmental Engineering and a Master of Science in Civil and Hydraulic Engineering with a minor in Roads and Engineering Structures from the International Institute for Water and Environmental Engineering (2iE) in Burkina Faso. Later, She received a Fulbright Scholarship to get a Master of Science in Civil Engineering, specializing in Structural Engineering, from the University of Nebraska-Lincoln, which she completed in 2021. She is pursuing a Ph.D. at the University of Arkansas under the guidance of Dr. Cameron Murray. In her free time, she enjoys painting, cooking, exploring new places, and trying new foods.



Rachael Panik,

**Researcher, Ph.D. Candidate
Georgia Institute of Technology**

Rachael Panik, AICP, is a Ph.D. Candidate and Research Assistant at the Georgia Institute of Technology in the School of Civil and Environmental Engineering. She holds a degree in civil engineering from the

University of Alabama at Birmingham and a master's in city and regional planning from Clemson University. Her expertise is formed from seven years of planning and engineering research and consulting experience. Her research spans several transportation and safety topics, including time series analytics, attitudes towards safety, non-motorized volume estimation, and risk-exposure measurements. Rachael's work is guided by her experience using research to help agencies meet their safety goals, and by her conviction that engineers can change peoples' lives by shaping the built environment.



Brad Perkins

**Lieutenant
Arkansas Highway Police**

LT Brad Perkins has been employed as an Arkansas Highway Police for 33 1/2 years. He is the Assistant District Commander of Arkansas Highway Police District One. LT Perkins has been involved in the Traffic Incident Management (TIM) Program since 2013 when it was first introduced to ARDOT / AHP by the FHWA. LT Perkins continues to coordinate the TIM training program for the state of Arkansas.



Christopher Pipkin

**GIS Analyst
ARDOT**

A 2021 Mississippi State University Meteorology graduate, Christopher honed his geospatial expertise as an on-air meteorologist in Mississippi and Alabama, using GIS to interpret weather patterns. He furthered his GIS skills during an REU internship, correlating radar-detected tornadic debris signatures with remote sensing data. Now at the Arkansas Department of Transportation, he continues his GIS journey, learning from world-class mapping creators and experts. During his time off, Christopher enjoys creating maps, weather forecasting, and chasing hurricanes.

**Robert Reed****Lead GIS Data Management Specialist
ARDOT**

Robert began his career with ARDOT in May 2001, starting in the Planning Division before moving to the Environmental Division. His undergraduate degree in Geography is from the University of Central Arkansas, as well as his graduate degree in GIS. Robert is an adjunct instructor in the GIS graduate program at UCA.

**Tisha Reynolds****Materials Specification Coordinator
ARDOT**

Tisha Reynolds is on a mission to partner with industry to improve asphalt pavement performance. For the last two years she has worked with the the members of the AAPA and the University of Arkansas to look at ways to improve asphalt pavement. She has 24 years of construction and materials experience with ARDOT. She was awarded the Director's Diamond Award in 2023 for outstanding public service. As the chair of TRC2201, she will go the extra mile to push ARDOT forward in innovation as they look at balanced mix designs.

**Jennifer Russell, EISE, CSEP****Program and Management Leader
Garver**

Jennifer Russell, EISE, CSEP is the Program and Management Support Leader on Garver's Water team. Over the past 25 years, she honed her West Point leadership motto of being a "Leader of Character." From strategic planning to tactical logistics, Jennifer has invested in public service and infrastructure. Her extensive experience in managing people, processes, and tools includes needs analysis, project definition, design, contract and construction supervision. The domains of her experience are a testament to the portability of her skill set and include water systems, software systems, high-speed rail, transit systems, highway systems, and multi-modal connectivity.

**Dean Scott****Highway Safety Specialist
NHTSA**

Dean Scott is a NHTSA Highway Safety Specialist in Kansas City, Missouri. Assigned and responsible for the State of Arkansas as the program liaison. He currently has 17 years of highway safety experience with NHTSA Region 7. He is serving on one national team, the NHTSA Occupant Protection Grant Review Team. There has been an impact in all program areas that he coordinates, most notably Occupant Protection. Dean received a Superior Achievement Award for Leadership and Program Excellence in FY 2022. He has a master's degree Management from Murray State University and earned a Bronze Star during Iraq combat tour as a military police officer and Platoon Sergeant for the US Army in 2005.

**Spencer Stillman****Vice President
Time Striping, Inc.**

Spencer Stillman started work with Time Striping Inc. in 1999. He started work as a supervisor in striping division installing snow plowable markers. He promoted to division manager over Time Striping's new traffic control division in 2000 and ran traffic control thru the first bond program. He was in charge of guardrail and wire rope safety fence division since 2012. Spencer was past president Arkansas ATSSA and currently sits on the ATSSA Guardrail and Membership Engagement committees.

**Eddie Tanner****Section Head - Health and Safety
ARDOT**

Eddie has spent the last 33 years with the Arkansas Department of Transportation as a Highway Police Officer, Health and Safety Officer and is currently the Section Head of Health and Safety.



Kaili Teeter
Photogrammetry Technician
ARDOT

Kaili has been a Photogrammetry Technician in the Surveys Division for three years. She joined the department after graduating from the University of Central Arkansas in 2021 with her Bachelors of Science in Geography with a concentration in Geospatial Technology. Her love of remote sensing lead her to the Photogrammetry section where she preforms planimetric mapping and collects LiDAR point cloud data. She obtained her FAA Part 107 commercial drone license in February of 2022 and has since become one of the primary UAV pilots in the Photogrammetry section. Kaili enjoys traveling the state while flying the departments Matrice 600 and continues this in her spare time by visiting Arkansas State Parks with her husband Will and their dog Poppy.



Nicci Tiner, P.E., P.T.O.E.
Vice President
Garver

Nicci Tiner is a vice president who is responsible for managing Garver's Transportation Planning and Traffic Team. As the team leader, she coordinates with Garver's internal transportation teams, assigns projects to staff, schedules projects, oversees task leads, and performs overall QA/QC of traffic engineering and planning projects. Nicci has 35 years of engineering experience. Her planning experience includes conducting studies to determine existing and future transportation needs. This consists of developing traffic forecasts based on historical data, travel demand models, and trip generation; evaluating the traffic and safety operations of intersections and corridors; and participating in public involvement meetings. Her design experience includes intersection design, ITS plans, traffic signal design, signing plans, and maintenance of traffic plans.



Lorie H. Tudor, P.E.
Director
ARDOT

Lorie Tudor was selected by the Arkansas Highway Commission to become Director of the Arkansas Department of Transportation (ARDOT) effective March 20, 2020. She is a career ARDOT employee and just celebrated her 40-year service anniversary. She is Professional Engineer. Tudor is currently serving as the President of the Southern Association of State Highway and Transportation Officials (SASHTO). She was appointed to the State Board for Licensure for Professional Engineers and Professional Surveyors in October 2020 and served as the Board's President in State Fiscal Year 2023.



Ram Veeragavan, Ph.D.
Project Engineer
Highway Technology Partners, LLC

Dr. Ram Kumar is currently working as a Project Engineer at the Federal Highway Administration-Mobile Asphalt Technology Center (MATC) since Oct 2019. He has been associated with State DoTs in performance testing, evaluation, refinement, and implementation of Superpave performance prediction tests on hot mix asphalt at the national level. He has rich experience working with State DoT agency personnel and contractors on onsite field testing, asphalt plant operation, and safety. He has participated in conferences for knowledge dissemination to DoT personnel, helped fine-tune test protocols and quality assurance procedures through specification reviews, and provided technical support to National research initiatives on testing and use of new materials for improved performance of road infrastructure



Kevin Weston

**Assistant Division Head
ARDOT**

Kevin Weston is the Assistant Division Head of Bridge Operations at the Arkansas Department of Transportation. Kevin has worked in District 6, Bridge Design, Heavy Bridge Maintenance in the Maintenance Division and now in the Bridge Operations Division. He works directly with the Bridge Inspection Program in Arkansas and oversees the 6 Bridge Operations Bridge Maintenance crews. Kevin enjoys applying new ideas to promote efficiency and performance in both the inspection and maintenance aspects of Arkansas' bridge inventory.



Deric Wyatt, P.E.

**State Maintenance Engineer
ARDOT**

Deric Wyatt is currently the State Maintenance Engineer for the ARDOT. He began his career with the Department by working as an engineering intern in the Department's Resident Engineer Office 05 in Osceola. Following graduation from Arkansas State University in December 2003 with a Bachelor's Degree in Engineering, he began working full time as a Civil Engineer at Resident Engineer Office 05. Following the engineering career path he was promoted to Resident Engineer in January 2009, District Maintenance Engineer for District Seven in October 2013, District Engineer for District Two in December 2015, District Engineer for District Six in August 2021. Then he was promoted to his current position of in September 2022. He is a Registered Professional Engineer.

PROJECT INFO & UPDATES

TRC1903

Investigating Concrete Deck Cracking in Continuous Steel Bridges
Principal Investigator: Ernie Heymsfield, University of Arkansas

Bridge deck cracking reduces the serviceability and lifespan of bridges. Early age cracking can typically be attributed to either of two factors: 1) construction practices and 2) concrete shrinkage. ARDOT has identified a disproportionate number of continuous steel girder bridges experiencing early age bridge deck cracking that were constructed using a continuous deck pour. ARDOT currently specifies a sequence deck pour at most bridges, however contractors prefer continuous deck pours because of the procedure's inherent ease and reduced construction time.

For this study, early age bridge deck cracking was conducted by monitoring the induced concrete tensile stresses during the construction process and comparing these values with the concrete's concurrent tensile strength. Two continuous deck pour bridges were instrumented to measure strains during: deck construction, concrete hardening, cooling, and densification stages. In addition, finite element bridge models were developed to analyze the problem.

To remedy conditions related to early age deck cracking, ARDOT should require contractors to use appropriate curing methods: moist curing and protecting the concrete from moisture loss until the concrete deck has gained sufficient tensile strength (generally 7-14 days).



TRC2101

Update of the ARDOT Workforce Forecasting System

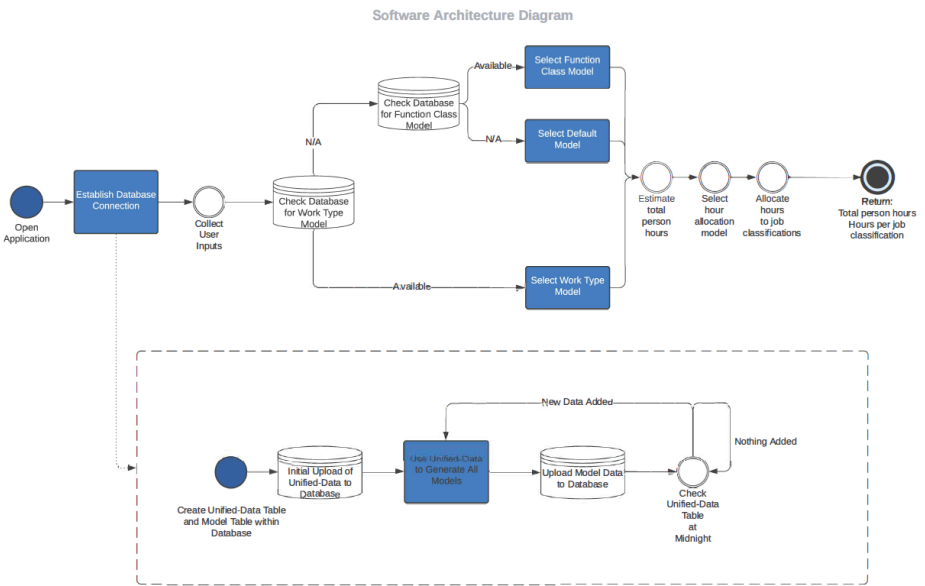
Principal Investigator: Suman Mitra, University of Arkansas

The goal of this study is to develop a process and tools to accurately estimate ARDOT construction staffing requirements for highway construction projects. This will be accomplished by three objectives:

Objective 1: Develop an annual forecasting model (Tasks 1, 2, and 3)

Objective 2: Develop a long-range forecasting model (Task 3)

Objective 3: Develop a construction workforce forecasting software tool (Task 4) Tasks 1 to 3 are complete. Task 4 [software development] is ongoing. To remedy conditions related to early age deck cracking, ARDOT should require contractors to use appropriate curing methods: moist curing and protecting the concrete from moisture loss until the concrete deck has gained sufficient tensile strength (generally 7-14 days).

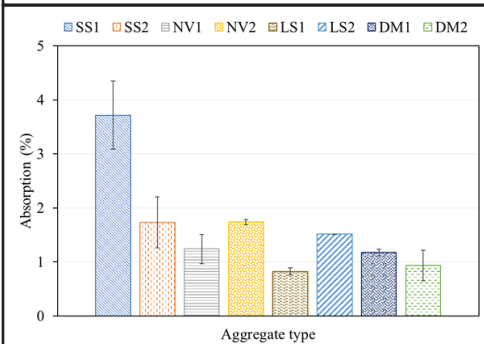
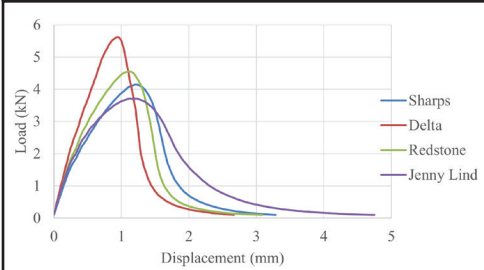
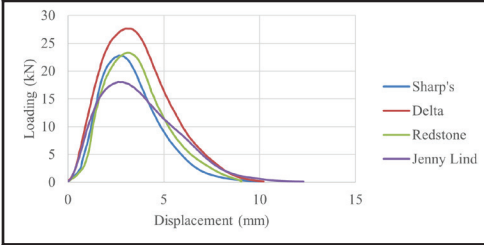
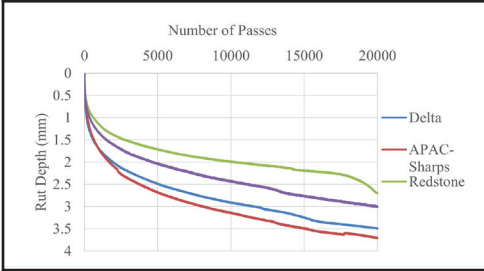
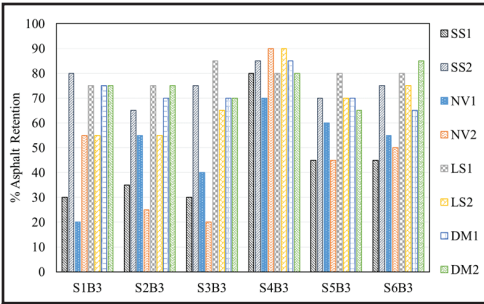


TRC2102

Effect of Aggregate-Binder Compatibility on Performance of Asphalt Mixtures in Arkansas

Principal Investigator: Zahid Hossain, Arkansas State University

According to the 2014 Standard Specifications for Highway Construction of the Arkansas Department of Transportation (ARDOT), three types of Performance Grade (PG) binders (PG 64-22, PG 70-22, and PG 76-22) are to be used in highway construction projects in Arkansas. Agency's approved aggregate types for surface asphalt concrete hot mix (ACHM) include limestone, dolomite, sandstone, novaculite, gravel, chert, syenite, and slag stated in ARDOT 2014 Standard Specification for Highway Construction. Certain aggregates around the State of Arkansas for asphalt mixtures caused serious durability and performance issues due to their



incompatibility with some PG binders. Such incompatibility can be associated with either chemical or adhesive bond failures between aggregate and binder. Asphalt mixtures containing incompatible binders and aggregates are highly prone to stripping that can cause significant premature moisture damage issues in the field. This project utilized four common aggregate types: sandstone, novaculite, limestone, and dolomite and all three PG binders from various sources to assess their compatibility. Highly absorptive aggregates (e.g., sandstone) can potentially lead to dry or brittle mixtures causing constructability and durability issues such as difficulty in obtaining specified compaction, early oxidation, premature cracking, and stripping. The ARDOT has placed a cap on the upper limit (60%) of limestone or granite usage, and the remaining 40% could be other mineral aggregates meeting the insoluble residue content requirements. However, no maximum limit for sandstone is specified in the ARDOT specifications. Thus, the compatibility issues are further augmented when an excessive amount of absorptive aggregates (e.g., sandstone) are used in the mixture.

The primary objective of this study was to recommend implementable test protocols that ensure the use of durable and compatible aggregate-binder systems in the mix design phase for enhanced mixture performance in the field. This study evaluated the rheological and chemical properties of (e.g., polarity and surface free energy aka SFE) of asphalt binders. Also, the physical, mechanical and chemical properties of aggregates were evaluated. Furthermore, selected surface ACHM samples from different plants and laboratory mixtures were evaluated for their mechanistic performance and moisture resistance. Based on test results, one sandstone was found to be highly absorptive. No

source dependency on the physical and mechanical properties of aggregates and the polarity of binders and aggregates was observed. The developed Excel-based compatibility database is expected to assist ARDOT in choosing appropriate test method(s) to screen incompatible aggregates/binders and admixtures to compensate for incompatibility to a degree. Based on the findings of this study, it was recommended to limit the sandstone aggregate up to 60%.

TRC2103

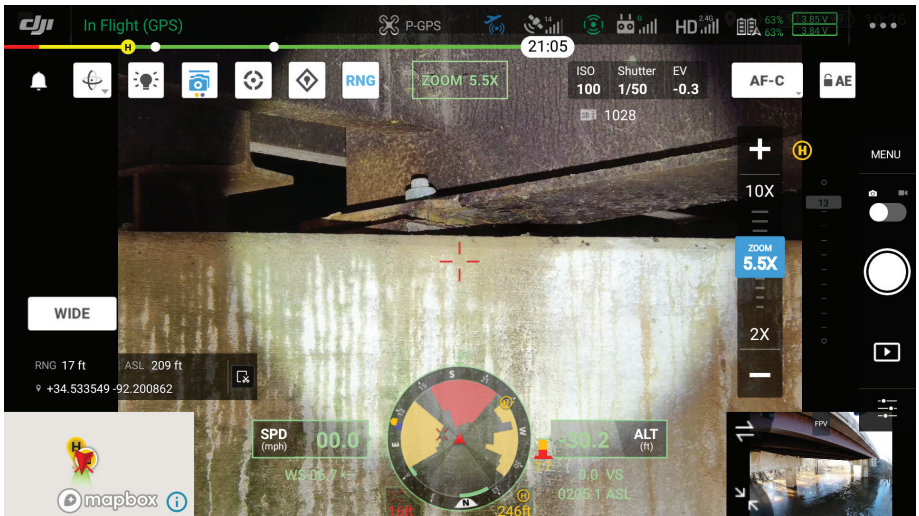
Developing Guidelines for Evaluating Weathering Steel Bridges

Principal Investigator: Ernie Heymsfield, University of Arkansas

Weathering steel enhances corrosion-resistant steel features over conventional steel when a patina properly forms on the weathering steel surface. The patina protects the steel member surface from corrosion by preventing moisture, oxygen, and contaminant penetration.

However, long periods of moisture and/or deicing chemicals applied during wet, wintry conditions can hinder proper patina formation. Weathering steel bridges in Arkansas are normally uncoated. In the TRC2103 study, weathering steel bridge corrosion severity was related to the overall bridge condition. Results were then used to rank ARDOT bridges as a function of their oxide film deterioration severity. More than 25 ARDOT UWS bridges were visited during the study to examine the bridge characteristics promoting oxide film degradation. An unmanned aircraft system (UAS) was used to help with the bridge inspections.

Commonalities among the inspected bridges experiencing significant oxide film degradation include deteriorated and/or missing bridge deck compression strip seals, the presence of vegetation near or in contact with the steel superstructure, and inadequate girder-water clearance. Remediation at bridges experiencing oxide film degradation include cleaning poor condition (Condition State 3) and severe condition (Condition State 4) girder areas, clearing vegetation, and in certain cases, applying an extra protective coating such as paint or primer near problematic areas.



TRC2104

Maintenance Guidelines for Mechanically Stabilized Earth (MSE) Walls

Principal Investigator: Michelle Barry, University of Arkansas

The overall goal of this project is to determine Best Management Practices (BMP) for MSE walls and to develop a maintenance inspector's guidebook which provides assistance to address potential signs of distress. The team has conducted a literature review and nationwide survey to gather information on common maintenance issues with MSE walls and to determine how other state DOTs are repairing or maintaining their MSE assets. An ARDOT GIS database is also being expanded to include information on the MSE walls managed in Arkansas and it will be used to track the inspection and maintenance activities going forward. The team is also compiling the knowledge gained into a best practices manual for ARDOT maintenance personnel. A concise plan for the implementation of the data analysis for this project has been outlined. This plan includes developing a comprehensive catalog of Arkansas's MSE walls with design specs and maintenance history as a baseline, utilizing an inspection checklist to assess and grade the condition of MSE walls, assessing maintenance and repair strategies from other states, customizing maintenance and repair activities, formulating a maintenance plan with preventative measures for long-term wall stability, and finally, adjusting inspection frequency based on performance and historical data for efficient resource allocation. The aim is to offer focused solutions for the distinct characteristics of MSE wall problems in Arkansas, streamlining the approach to effectively address these issues. The inspection checklist is being finalized and the Final Report for this project is awaiting approval.

TRC2105

Innovative Countermeasures to Deter Wrong-Way Driving

Principal Investigator: Kim Romano, ARDOT

Countermeasures that include lighted signs that activate when a wrong-way driver is detected were reviewed. Power to signs (solar or AC), means of communications (modem or fiber), and means of wrong-way driver detection (visual, infrared, or radar) were considered in ranking the wrong-way driver detection (WWDD) systems. A supplier was selected based on ARDOT needs, and WWDD systems were installed at two exit ramps on I-440 at Highway 165 in North Little Rock. The WWDD systems have so far proven successful in deterring wrong-way drivers.

TRC2106

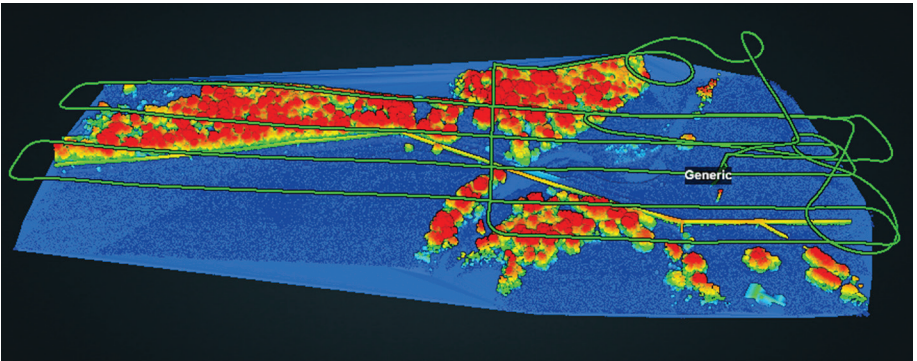
Applying UAS LiDAR for Developing Small Project Terrain Models

Principal Investigator: Clinton Wood, University of Arkansas

The TRC2106 study considered five small bridge projects where UAS LiDAR was flown, and conventional surveying checkpoints were measured in the LiDAR survey area. The results indicate that for hard surfaces, UAS LiDAR is generally accurate to within -1.0 inch to +1.0 inch, with variations observed across the different sites. Soft surfaces, particularly grass, exhibited LiDAR overestimation ranging from 0.0 to +2.0 inches and up to +3.0 inches at the Humnoke



site. Tall grass and tree checkpoints demonstrated larger errors, with variations among the sites. Overall, the root mean squared errors for the different surface types ranged from 0.5 to 7.0 inches, with asphalt having the lowest error and trees having the highest. The study concludes that UAS LiDAR provides good accuracy for hard surfaces, with expected larger errors for soft surfaces, and offers cost benefits over alternative surveying methods. Comparative cost analyses revealed that UAS LiDAR is approximately \$1,195.41 less expensive per project than helicopter LiDAR and \$10,539.18 less expensive per bridge project compared to conventional surveys, resulting in a 20 and 25 percent cost reduction, respectively. Despite having slightly less accuracy for soft surfaces, the cost-effectiveness of UAS LiDAR makes it a favorable choice for small-area bridge projects.



TRC2107

Non-Nuclear Moisture Content and Density Determination Principal Investigator: Rick Coffman, University of Arkansas

The main objective of this study is to determine if there are any technologies capable of replacing the nuclear density gauge for moisture and density determination. There are currently non-nuclear methods of determining density of subgrade material that can provide accurate results compared to the nuclear density gauge, but other methods need to be considered as well to determine the best possible replacement for the nuclear density gauge. The research associated with this study will be performed through four tasks: 1) Determine which non-nuclear devices rapidly and accurately determine moisture and density values that are comparable to the nuclear density gauge. A literature and available product review will be performed to determine which non-nuclear devices rapidly and accurately determine moisture and density values. 2) Evaluate what methods of determining moisture content are available that have the same ease of use and speed as the nuclear gauge. Methods of obtaining water content in less than three minutes will be evaluated. 3) Determine the most accurate and rapid methods of determining moisture content, density, or a combination of the two. The most accurate and rapid method of determining moisture content, density, or a combination of the two will be evaluated by means of statistical analyses on the measured data that will be collected by the participants of the Center for Training Transportation Professionals (CTTP) classes. 4) Develop a testing and procedure manual and a training module. A testing manual and training module will be developed for the most accurate and rapid methods that are found during Task 3. The testing and procedure manual will include step-by-step procedures on how to operate the device. The testing and procedure manual will also include a section on typical results determined from the device for subgrade and base course materials.

TRC2201

Update to ARDOT Superpave Gyration Compaction (SGC) Specification to Increase Pavement Durability

Principal Investigator: Andrew Braham, University of Arkansas

For Task 1, the literature review is continuing. For Task 2, IDEAL-CT and APA samples have been tested for the coarse gradation of the cube, while all volumetric testing has been completed for the fine gradation without RAP of the cube. For Task 3 2023 mixes, the remaining tests are I-FIT and dynamic modulus for the Rogers mix (A80021) and the Atlas mix (A90021). For Task 3 2024 mixes, the IDEAL-CT and APA has been run on the PMLC, while the APA has been run on the LMLC for the Rogers mix (A60043). In addition to the lab testing, the compaction metrics spreadsheet was developed and distributed for use by ARDOT and contractors. For Task 5, simulations have started on Pavement-ME and for one set of mixtures, the 2023 Delta mix (A00039). LMLC shows higher rut depth and bottom-up cracking compared to RPMLC, but lower top-down cracking.

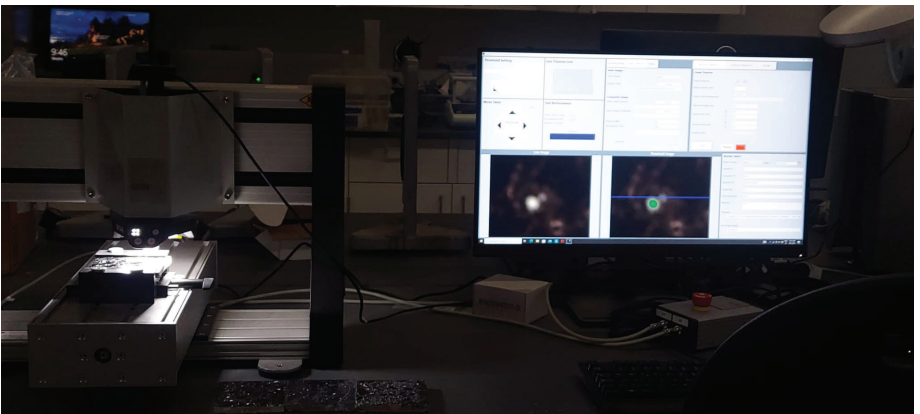


TRC2203

Low Shrinkage Concrete Mixtures for Arkansas

Principal Investigator: Cameron Murray, University of Arkansas

The goal of TRC 2203 is to examine the effect of aggregate species on drying shrinkage of concrete and any effects of reducing the cement content and improving the aggregate gradation on the resulting shrinkage. So far, changes in gradation and cement content do not cause



reductions in drying shrinkage. The aggregate species does have an influence on shrinkage based on testing on five aggregate sources. The current and ongoing work will attempt to reduce drying shrinkage in bridge deck mixtures through the use of shrinkage reducing admixtures and calcium sulfoaluminate cement based additives. These adjustments are expected to mitigate drying shrinkage, especially for the worse performing aggregates. The final goal is to present ARDOT with preliminary specification language for low-shrinkage concrete mixtures. Additional testing on the air void systems and freeze-thaw performance is also running in parallel as a complement to the study.

Image caption: The image shows a hardened air void analysis being performed on a polished and painted concrete sample. This method measures the volume and spacing of air voids in hardened concrete.

TRC2204

Materials and Testing Specifications for Drilled Shaft Concrete Principal Investigator: Richard Coffman, University of Arkansas

Self-consolidating concrete (SCC) is a relatively new concrete technology which allows the concrete to be placed without the need for manual or machine vibration. This innovation reduces labor costs, construction times, and can provide a smooth, finished surface. This technology is used in the United States primarily in the precast and prestressed concrete industry. The utility of SCC in structural applications, such as areas of dense reinforcement or locations where complex geometry makes consolidation impossible, is also advantageous. In this study, a series of SCC mixtures were developed both with and without fly ash replacement. These mixtures were then used to compare how SCC performed relative to traditional slump concrete in drilled shaft applications. The SCC mixtures also contained different aggregate sizes (#7 and #57), blended in multiple ratios. The impact of these mix proportions was evaluated based on the fresh properties and strength of the SCC. Fresh property testing was performed using specialty test methods developed for use with SCC. To examine the performance of these mixtures in underwater placements, a washout test was performed. A viscosity modifying admixture (VMA) was included for these tests to improve the resistance to washout. Finally, seven simulated drilled shafts were placed in wet and dry environments to test how each SCC mixture performed. These shafts were compared to two shafts (one placed underwater and one placed dry) made with a traditional slump concrete mix. The #7 aggregate showed superior performance in fresh property testing compared to both #57 aggregate mixes and blended #7 and #57 aggregate mixes. VMA was found to improve washout resistance of SCC but was detrimental to other fresh properties. Fly ash negatively affected the early-age strengths (three day and seven-day), but significantly



improved ninety-day strengths compared to the standard SCC mixture. Higher fly ash replacements also resulted in significant decreases in peak concrete temperatures and increased the time to reach these peak temperatures. SCC mixes performed significantly better during the scale shaft placements due to its deformability and flowability compared to traditional slump concrete. The wet environment placements showed that SCC provides an improved finished product and has incredible promise for use in drilled shaft applications and other structural elements.

TRC2301

Smart Work Zone (SWZ) System Design, Specifications, Estimates, and Implementation Guidelines

Principal Investigator: Suman Mitra, University of Arkansas

The objectives of this study are to assess the effectiveness of AWIS/SWZ intelligent transportation system (ITS) strategies used in Arkansas construction zones and update existing system design to reduce costs and improve efficiency. To accomplish this, a facilitated workshop with the Subcommittee and Stakeholders will be hosted wherein a draft of an SWZ/AWIS Concept of Operations (CONOPS), including goals and objectives to guide the direction of TRC2301, will be created. A decision tree incorporating AWIS/SWZ system decisions earlier in the project planning, transportation management plan (TMP), and project development processes will be prepared. The research team will then conduct a comprehensive review of the projects where AWIS has historically been used and recommend project selection criteria that consider recommendations from this research and the use of review probe, crowdsourced, and third-party provider data. By incorporating data from other DOT's SWZ special provisions, this research project hopes to provide standard procedures for designing AWIS/SWZ systems and estimating costs while also recommending updated text for the AWIS/SWZ Special Provisions and, if needed, to the Maintenance of Traffic (MOT) Special Provision. This will ensure that SWZ efforts are fully integrated with other ARDOT TSMO systems and a key focus of this effort should be to ensure that SWZ efforts are integrated with other ARDOT efforts such as the TMC, IDriveArkansas, etc. for maximum effectiveness.

TRC2302

Development of Pedestrian and Bicyclist Flow Volumes and Risk Factors

Principal Investigator: Suman Mitra, University of Arkansas

The objective of this study is to collect data on travel patterns of non-motorized transportation users. Observational field data will be used to test the accuracy emerging data sources such as cell phone tracking data. Both observational and emerging source non-motorized traffic volume data will be overlaid with historical crash and roadway inventory data to determine crash risks. Based on crash risks, countermeasures can be implemented to address the increasing number of suspected serious injuries and fatalities among this vulnerable user group. This will lead to better informed future project coordination and infrastructure prioritization. The revised version of Task 1 has been submitted, incorporating the feedback from the sub-committee. The research team has commenced Task 2, focusing on data collection, and recently held a meeting with the sub-committee to discuss count location, duration, and devices. We have received valuable recommendations regarding count locations and have begun compiling a preliminary list of potential locations and suitable technology, which will be further deliberated with the sub-committee in the upcoming quarter. Additionally, the research team has initiated contact with Strava to access crowd-sourced data and is currently in the process of acquiring it.

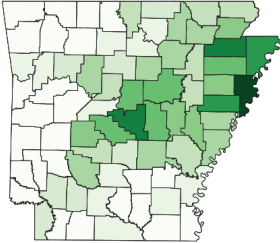
TRC2303

Evaluation of Impacts Due to a Bridge Closure: A Case Study of the Mississippi River Bridges in Arkansas

Principal Investigator: Sarah Hernandez, University of Arkansas

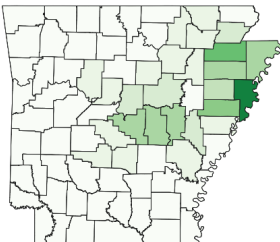
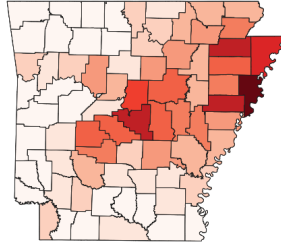
This project will evaluate the impact of bridge closures on traffic patterns, safety, and waterway commerce. Impacts of closures will be estimated for full and partial closure scenarios for the four bridges that cross the Mississippi River in Arkansas including the I-55 and I-40 bridges. Data to support estimation efforts comes from passenger and freight GPS/cell phone tracking, traffic sensors, marine vessel tracking, and commodity flow data sets.

AR Counties (Origins) to I-40 Bridge (Destinations)

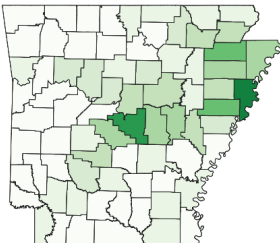
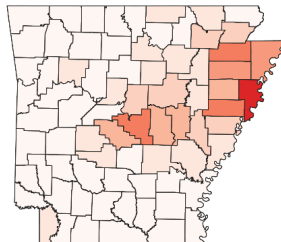


4/15/2021 - 4/30/2021 (Pre-Closure)

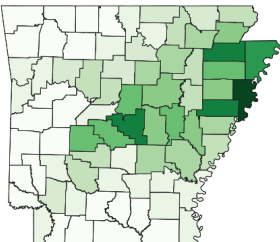
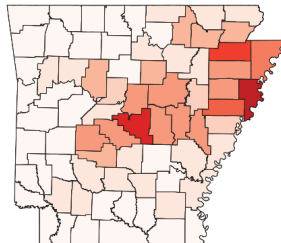
I-40 Bridge (Origins) to AR Counties (Destinations)



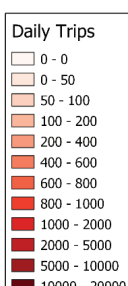
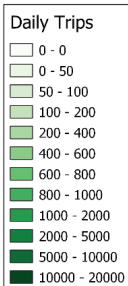
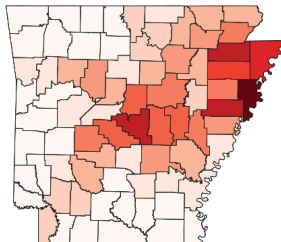
5/11/2021 - 7/31/2021 (Full-Closure)



8/1/2021 - 8/6/2021 (Partial-Closure)



10/15/2021 - 10/30/2021 (Post-Closure)



TRC2401

Evaluation of Alkali-Silica Reaction (ASR) Potential for Aggregate Sources in Arkansas

Principal Investigator: Lakisha Rice, ARDOT

New test methods have been developed to determine the susceptibility of aggregates to ASR and the alkali threshold of aggregate combinations. This project will examine the ASR susceptibility of aggregates, determine the alkali threshold of common aggregate combinations, and develop a mix design analysis tool to evaluate the ASR susceptibility of concrete mix designs.

TRC2403

Evaluation of Air in Concrete

Principal Investigator: Jared Johnson, ARDOT

New test methods have been developed to determine the susceptibility of aggregates to ASR and the alkali threshold of aggregate combinations. This project will examine the ASR susceptibility of aggregates, determine the alkali threshold of common aggregate combinations, and develop a mix design analysis tool to evaluate the ASR susceptibility of concrete mix designs.



RESEARCH SECTION



FROM TOP LEFT TO RIGHT: Lauren Baker, Sanghyun Chun, Wendy Davis, Hala Elia, Timberlee Gasparro, Gloria Hagins, Ahmed Muftah, Zac Ray, Robin Russell, Mark Simecek, Bethany Stovall



WE'D LOVE SOME FEEDBACK!

Scan the QR code and let us know what you liked or where there's room for improvement.

PROFESSIONAL DEVELOPMENT HOURS TRACKING

MARK IF ATTENDED

TUESDAY, MAY 21

GENERAL SESSION | ROOM 207-209

2:30 PM - 3:00 PM	Creating Equitable Traffic Safety through a Vision Zero Approach	
3:30 PM - 4:00 PM	TRB 101: What You Need To Know About The Transportation Research Board	
4:00 PM - 4:30 PM	From the Flintstones to the Jetsons: How Transportation Affects the Protection of Roadway Workers	
4:30 PM - 5:30 PM	Safety Advances for Roadway Workers	

WEDNESDAY, MAY 22

SAFE SYSTEMS PLANNING AND OPERATIONS | ROOM 207

8:00 AM - 8:30 AM	Lighting in the Balance: The Highs and Lows Roadway Lighting	
8:30 AM - 9:00 AM	2024 Solar Eclipse Traffic Management Plan	
9:00 AM - 9:30 AM	Four Minutes of Darkness, Lessons Learned from the 2024 Solar Eclipse	
10:00 AM - 10:30 AM	The Safe Systems Pyramid: A New Framework For Traffic Safety	
10:30 AM - 11:00 PM	A Crash Course on Arkansas' Data	
11:00 AM - 11:30 AM	Stuck No More! ARDOT's Incident Management On I-40	
11:30 AM - 12:00 PM	Road Safety Audits	

SAFETY IS NO ACCIDENT | ROOM 207

1:30 PM - 2:00 PM	Making Work Zones Safer	
2:00 PM - 2:30 PM	Traffic Incident Management and TIM Training Facility	
2:30 PM - 3:00 PM	TSMO Safety Innovation at ARDOT	
3:30 PM - 4:00 PM	Safety Assessment For Every Roadway (SAFER)	
4:00 PM - 4:30 PM	High Crash Work-Zones	
4:30 PM - 5:00 PM	Charting a Course to Safer Streets: Fayetteville's \$25 Million Safe Streets 4 All Initiative	
5:00 PM - 5:30 PM	Right Vs Wrong: Reducing Wrong-Way Crashes In Arkansas Using Passive And Active Systems.	

TECHNOLOGY AND INNOVATION | ROOM 209

8:00 AM - 8:30 AM	EnViewer to EnQuery: Seeing is Believing! Behind the Scenes of Arkansas Road Projects!	
8:30 AM - 9:00 AM	Digital Engineering QC - A New Way	
9:00 AM - 9:30 AM	Safety Analysis Process: Core Module #7	
10:00 AM - 10:30 AM	142+ Hours	
10:30 AM - 11:00 PM	What Can Right of Way Engineering Do For You?	
11:00 AM - 11:30 AM	ARDOT Real-Time GNSS Network	
11:30 AM - 12:00 PM	Stuck In Traffic? We know Why! A Look at ARDOT's Resources to Analyze Congestion on Arkansas' Highways	

RESEARCH UPDATE | ROOM 209

1:30 PM - 2:00 PM	TRC2104 - Maintenance Guidelines for MSE Walls	
2:00 PM - 2:30 PM	TRC2101 - Update of the ARDOT Workforce Forecasting System	
2:30 PM - 3:00 PM	TRC2102 - Effect of Asphalt-Binder Compatibility on Performance of Asphalt Mixtures in Arkansas	
3:30 PM - 4:00 PM	TRC2103 - Developing Guidelines for Evaluating Weathering Steel Bridges	
4:00 PM - 4:30 PM	TRC2303 - Evaluation of Impacts Due to a Bridge Closure: A Case Study of the Mississippi River Bridges in Arkansas	
4:30 PM - 5:00 PM	TRC2203 - Low Shrinkage Concrete Mixtures for Arkansas	
5:00 PM - 5:30 PM	TRC2204 - Materials Testing Specifications for Drilled Shaft Concrete	

THURSDAY, MAY 23

BRIDGE TECH | ROOM 207

8:00 AM - 8:30 AM	ARDOT's New Bridge Inspection Technology	
8:30 AM - 9:00 AM	Why Bridge Load Ratings are Important	
9:00 AM - 9:30 AM	Rehabilitation of the Garrison Avenue Bridge in Fort Smith, Arkansas	
10:00 AM - 10:30 AM	Utilizing Contractual BIM in Your Structures Workflow, Design to Construction	
10:30 AM - 11:00 PM	TRC1903 - Investigating Concrete Deck Cracking in Continuous Steel Bridges	
11:00 AM - 11:30 AM	A View From Below: The ARDOT Dive Team Initiative	
11:30 AM - 12:00 PM	wikiHow to Repair a Bridge in Arkansas?	

INFRASTRUCTURE MATERIALS | ROOM 209

8:00 AM - 8:30 AM	FHWA - Mobile Asphalt Technology Center	
8:30 AM - 9:00 AM	Effect of Lag and Dwell Time on Balanced Mix Design Testing	
9:00 AM - 9:30 AM	Partnering Pavement Performance	
10:00 AM - 10:30 AM	New Friction/Polishing Test for Asphalt Mixtures	
10:30 AM - 11:00 PM	Earthquake-Induced Soil Liquefaction and Transportation Structures	
11:00 AM - 11:30 AM	Understanding Alkali-Silica Reaction Susceptibility of Aggregates Used in Concrete	
11:30 AM - 12:00 PM	Practical Applications of the TFHRC ASR Management Tools	

Total Number of possible PDH Credit Hours: 14



Get To Know Our Vendors!

- 1) Visit with an Exhibitor**
- 2) Learn Something New**
- 3) Earn a Bingo**

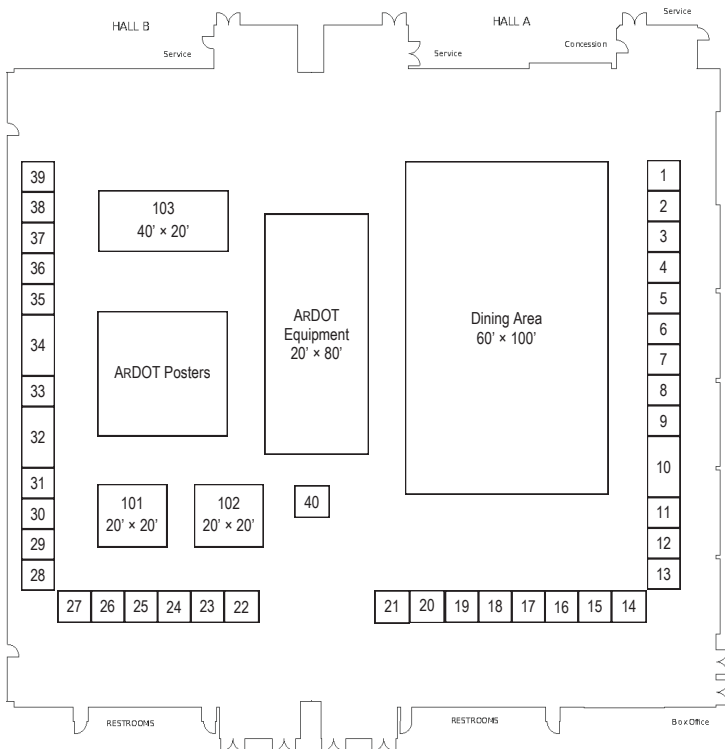
Once you've filled your entire bingo card (found in your welcome bag), take it to the ARDOT Booth to be entered into a drawing for some cool prizes!

Drawings will be held during breaks.

Listen for the winners to be announced. It could be you!

Must have FULL card and be present to win.

MAP EXHIBIT HALL



- | | | |
|---|--|---|
| 1 SSR | 15 Garver | 29 Fisher Arnold |
| 2 McClelland Consulting Engineers | 16 Detco Industries, Inc. | 30 Vulcan Signs |
| 3 3M | 17 Horizon Signal | 31 UES/Geotechnology |
| 4 Wavetronix Inc. | 18 Doggett Freightliner | 32 Warrior USA, LLC |
| 5 Jacobs Engineering Group | 19 ORC | 33 Corrective Asphalt Materials |
| 6 Pexco, Davidson Traffic Control Products | 20 TufTile | 34 Solar Lighting International |
| 7 Rinker Materials | 21 IQ | 35 Site 20/20 |
| 8 Contech Engineered Solutions | 22 Blackmon Auctions, Inc. | 36 PSS Innovations |
| 9 BGE, Inc. | 23 Advanced Drainage Systems | 37 Viking-Cives Midwest |
| 10 Mid-South Packing and Seals | 24 Good Earth Tools | 38 Certified Power, Inc. |
| 11 GeoTree Solutions, Inc. | 25 CMC | 39 Dolinger & Associate, LLC |
| 12 Omega Liner Company | 26 American Concrete Pavement Association | 40 ATSSA |
| 13 K&K Systems, Inc. | 27 Pinkley Sales Company | 101 ARDOT - LTAP, Research and Materials |
| 14 John Wright Associates | 28 Hydro-Technologies/Modified Concrete Suppliers | 102 Time Striping, Inc. |
| | | 103 Anderson UnderBridge |



MID-SOUTH PACKING AND SEALS

