



# TECHNOLOGY TODAY

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## UPCOMING EVENTS

National Highway Institute Course No. 130053:  
Bridge Inspection Refresher Training  
June 25-27, TTEC 100

Foundations of Leadership Development  
July 11, TTEC 179

To view more events, please visit  
<http://www.ltrc.lsu.edu>.

## RESEARCH

# LTRC Project Aims to Get Pavement Management Out of a Rut

*Researchers design new process to correlate statewide rutting data*

Asphalt pavements across Louisiana experience wear and tear over time, leading to “rutting,” or the surface depression that commonly occurs in wheel paths on state roadways. This process is inevitable on asphalt surfaces and is exacerbated by heavy traffic loads. In an effort to keep Louisiana’s roads safe and fully functional, DOTD carefully monitors the levels of rut depth across the state, utilizing LTRC resources to assist in this process. However, DOTD and LTRC currently use two different methods to collect and analyze this data. Thanks to the recent research efforts of LTRC’s Qiming Chen, Ph.D., P.E., the state now has a proposed plan to correlate these two distinct data sources, and as a result, more effectively evaluate and maintain its roadways.

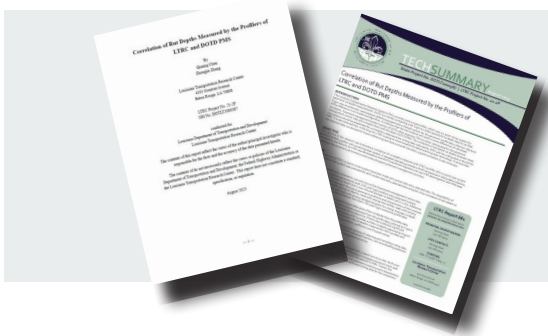
Dr. Chen and his team’s project, “Correlation of Rut Depths Measured by the Profilers of LTRC and DOTD PMS (Pavement Management System),” aimed to develop a reliable correlation between the rutting data collected by LTRC’s road profiler, which utilizes a five-point rut bar system, and DOTD’s Fugro Pave3D system, which employs

*continued on page 2*

the latest three-dimensional laser scanning technology to analyze pavements. Chen explained the rationale behind the project: “Because of the difference in rut model and algorithm...the two systems result in some differences of calculated rut depths. The correlation...between the two systems should be established, so when LTRC data is requested, it can be used together with PMS data to serve DOTD’s needs.”

Following an extensive review of existing correlation methods between the divergent technologies, the project involved a series of live tests on roadways near LTRC’s pavement research facility in Port Allen (*pictured on page 1*), as well as at other selected control sites across the state. These tests measured the reliability and repeatability of the LTRC profiler’s rutting data at various distances. Chen’s team discovered that measuring pavements in increments ranging from 0.004 to 0.1 miles improved the repeatability of the collected data, achieving an overall correlation value of 0.90 or above between the LTRC and DOTD methodologies. Additionally, the team determined that roadways with significant cracks are not suitable for reliable data collection and should be avoided in future tests.

The primary goal of Dr. Chen’s research was to develop a standard operating procedure (SOP) for correlating the rutting data obtained using the two systems, enabling both historical and future data gained from LTRC’s technology to be accurately analyzed and fully utilized by DOTD’s pavement management experts. Even as the LTRC staff looks toward a potential move in the future to a three-dimensional laser scanning system similar to the one currently used by DOTD, establishing this process now will prevent archival data from becoming obsolete. Through this project, Dr. Chen’s team has provided DOTD’s pavement engineers with a fantastic tool to ensure Louisiana’s roadways are maintained appropriately to best serve the state’s drivers.



**For more information** on this project and its findings, please visit [www.ltrc.lsu.edu/pubs\\_final\\_reports.html](http://www.ltrc.lsu.edu/pubs_final_reports.html) and select **Final Report 681**. You can also contact Qiming Chen, Ph.D., P.E., at (225) 767-9104 or [qiming.chen@la.gov](mailto:qiming.chen@la.gov).

## Save the Date for LTC 2025!

The **Louisiana Transportation Conference** is back for 2025! It is scheduled for **March 16-19, 2025**, at the Raising Cane’s River Center in Baton Rouge.

Hosted by LTRC and DOTD, the conference will include a diverse array of presentations from transportation officials across the state. Registration opened for Exhibitors and Sponsors on May 28, and for general attendees on **August 1**.

Save the date now, and make plans to join us for a fantastic week at LTC 2025!



**Registration  
Opens  
August 1!**



## TRAINING

# Dr. Wheat's Competency Model Continues to Strengthen DOTD Training Efforts

With approximately 4,200 employees across 50+ diverse sections, Louisiana DOTD's training needs are both remarkably broad and frequently changing. Add to this the inherently dynamic nature of the transportation industry, and it rapidly becomes clear that keeping the state's workforce well-informed and -equipped is a massive—yet critically important—undertaking. Garrett Wheat, Ph.D. (*pictured at right*), LTRC's Statewide Strategic Program Manager, is seeking to meet this challenge through an ambitious, multi-year competency modeling project.

Mary Leah Coco, Ph.D., Associate Director of Technology Transfer and Training, highlights the tremendous value of Dr. Wheat's work to the department as a whole: "By clearly defining the (necessary) competencies (across the department), the model provides a roadmap for recruitment, development, and performance evaluation... ultimately fostering talent growth, driving innovation, and ensuring a sustained competitive advantage in today's dynamic landscape."

The modeling project's primary goal is to identify the key competencies needed in each of DOTD's sections, then match them to currently available internal and external training opportunities. Where significant training gaps are identified, Dr. Wheat and his team work directly with section heads to develop creative and effective solutions to best serve department employees. These solutions can range widely from self-directed learning opportunities (e.g., books, manuals, and instructional videos) to in-person and virtual training courses.



Wheat's process for uncovering competencies is quite thorough, involving several detailed steps and a broad array of voices from across the department. He explains: "We use several research tools, including surveys and group interviews, to hear directly from employees about their training needs, both right now and as they look to the future of the industry. We try to focus on the areas of highest impact so that we can be sure we are making the best use of the department's financial and human resources."

While this process can be lengthy, the early returns from Dr. Wheat's highly intentional efforts are impressive. He recently completed modeling processes for Sections 82 (Highway Safety) and 30 (Location and Survey), and he and his team are currently working with Sections 80 (Contract Consultant Services), 24 (Road Design), and 25 (Bridge and Structural Design) as well. He plans to continue serving the department in this way as its diverse workforce, as well as the broader transportation landscape, continues to grow and change.

*For more information on this project's current and future endeavors, contact Garrett Wheat, Ph.D., at (225) 767-9210 or [garrett.wheat@la.gov](mailto:garrett.wheat@la.gov).*

*"This model provides a roadmap for recruitment, development and performance evaluation...ultimately fostering talent growth, driving innovation, and ensuring a sustained competitive advantage in today's dynamic landscape."*

*Mary Leah Coco, Ph.D.  
Associate Director, Technology Transfer*



## COMMUNITY

# AASHTO STEM Outreach Solutions Launches Louisiana's Students and Teachers into the Wonderful World of Transportation

As the transportation industry across Louisiana and the United States continues to evolve, LTRC is playing an important role in inspiring and equipping the next generation of scientists, engineers, and individuals in other key industry roles. This aim is accomplished in large part through an ongoing partnership with AASHTO STEM Outreach Solutions, formerly known as the TRAC (Transportation and Civil Engineering) and RIDES (Roadways into Developing Elementary Students) programs. This initiative is a hands-on program for Kindergarten through 12th grade students that provides them with opportunities to use math and science skills to solve real-world problems in transportation and civil engineering, with the goal of inspiring the workforce of the future to consider careers in the dynamic industry.

Stacey Wilton, LTRC's Education Outreach Program Manager, recently partnered with several AASHTO STEM Outreach staff members to organize a two-day training event for Louisiana teachers. Hosted at LTRC's Transportation Training and Education Center on March 18-19, this interactive experience provided 19 educators from across the state's public, private, and charter schools with an opportunity to receive hands-on training on multiple transportation-related STEM activities that can be integrated into their classrooms.

Participating teachers of all grade levels received a comprehensive collection of materials and detailed instructions to take back to their schools and utilize with students of all ages. The modules include Bridge Design, Magnetic Levitation, Traffic Technology, Road Safety, and more. Even more impressively, this training event and all of the program materials are provided to teachers completely free of charge, thanks to generous funding from the Federal Highway Administration.

As a former educator, Wilton recognizes the impact of such quality resources and training: “For years, like many teachers, I spent so much money out of my pocket to prepare my classroom and lessons. Through the funding (LTRC) is able to use for this program, participating teachers are equipped with multiple ready-made lessons, including all of the necessary materials, that they can take back to their classrooms and use immediately. This is an amazing benefit.”

Wilton is also excited about the potential impacts of the program on students across Louisiana, not only now but in the future as well. She emphasizes: “Today’s students are tomorrow’s scientists, engineers, and so much more. These engaging, hands-on STEM lessons allow students to collaborate with their peers to think critically and work through the problem-solving process. They provide a wonderful opportunity for students to explore transportation and engineering concepts while having a great time too!”

*If you are interested in learning more about AASHTO STEM Outreach Solutions and receiving information on future resources and training opportunities, please contact Stacey Wilton at (225) 767-9141 or [stacey.wilton@la.gov](mailto:stacey.wilton@la.gov).*

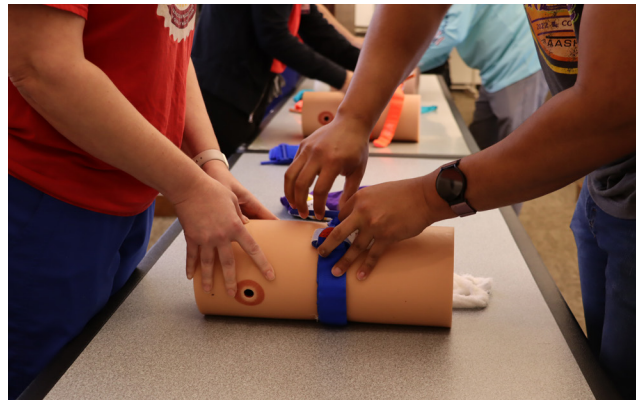


## STEM Outreach in Motion



## TRAINING

# LTRC Staff Gains Life-Saving Skills Through Recent Emergency Trainings



Safety is a foremost priority at LTRC, and the center's leaders are committed to equipping staff members with the skills necessary to respond proactively in an emergency situation. With this goal in view, LTRC recently hosted two important trainings—CPR and First Aid, led by DOTD staff, as well as Stop the Bleed (*pictured at top right*), administered by partners from Our Lady of the Lake Regional Medical Center. These interactive experiences equipped team members with a broad array of skills, including: performing chest compressions, administering rescue breathing, operating an AED device, providing basic first aid, and dressing a variety of wounds.

Tyson Rupnow, Ph.D., LTRC's Associate Director of Research, highlights the inestimable value of such training opportunities: "I believe all of our employees should have a basic knowledge of first aid and CPR training. For example, when working in the external heat conditions we experience performing field research work, it is necessary to understand the dangers and signs that accompany the various health conditions that can arise." Dr. Rupnow adds: "These are trainings that we hope to never be called upon to use, but knowing how to do these things can potentially save lives."

In addition to these two training classes, all LTRC staff members were provided with new rescue mask kits for their offices, and both of the center's buildings were equipped with new and up-to-date rescue equipment, including AED devices. While it is certainly best if these items do not need to be utilized, such intentional, proactive preparation provides team members and their visitors with the knowledge, resources, and confidence necessary to act appropriately if or when an unexpected medical incident occurs.

## PUBLICATIONS

### Recently Published

#### **Project Capsule 23-4B**

*Literature Review of IDEAL-CT and IDEAL-RT Test Methods for Balanced Mixed Design*

Saman Salari, P.E.

#### **Project Capsule 24-3GT**

*Statewide Calibration of CPT Direct Design Methods Using Static Load Test Data*

Murad Y. Abu-Farsakh, Ph.D., P.E.

#### **Final Report and Technical Summary 694 (21-1P)**

*Prediction of Road Condition and Smoothness for Flexible and Rigid Pavements in Louisiana Using Neural Networks*

Zhong Wu, Ph.D., P.E.; Yilong Liu, Ph.D.

#### **Final Report and Technical Summary 693 (22-5SS)**

*Analyzing Human Mobility for Active Transportation Planning in Louisiana*

Ruijie "Rebecca" Bian, Ph.D., P.E.; Tara Tolford

#### **Final Report and Technical Summary 670 (20-1B)**

*Evaluation of Performance and Life Cycle Cost of Asphalt (8/18 Specifications)*

Corey Mayeux, P.E.; Moses Akentuna, Ph.D., P.E.; Saman Salari, P.E.



**VIEW ONLINE**

To download a complete list of LTRC publications, visit the website at [www.ltrc.lsu.edu](http://www.ltrc.lsu.edu).

## Updates & Accomplishments

**Ruijie “Rebecca” Bian, Ph.D.**, LTRC’s Planning and Intermodal Research Manager, was recently selected and funded to attend two events organized by the National Academies of Sciences, Engineering, and Medicine (NASEM). At these events, Dr. Bian shared her work conducted in Louisiana around community resilience.

The 2024 Gulf of Mexico Conference (GOMCON) was held in Tampa, Florida, during the week of February 19. GOMCON facilitates conversations among Gulf of Mexico scholars from a wide range of disciplines. Dr. Bian presented her work visualizing crash risk during extreme weather for public sharing and research activities. The First Connections to Sustain Science in Latin America symposium (*pictured below*) was hosted in Barranquilla, Colombia, during the week of February 26. Its goal was to enhance the scientific exchange among researchers across the Western Hemisphere. Dr.

Bian is one of the 93 scholars identified as emerging leaders in engineering by the NASEM Policy and Global Affairs Division. She presented her work using Location Based Service data to understand human mobility during hurricanes, for the purpose of better disaster preparedness. Additionally, Dr. Bian will also serve as one of the 15 faculty mentors for the LSU Gulf Scholar Program in summer 2024. She will work with undergraduate students to foster their research interests and critical thinking skills. She welcomes students who want to contribute to their communities to join her for scientific research explorations.



Congratulations to **Dynah Capone** for her recent promotion to Program Director of the Louisiana Local Technical Assistance Program (LA LTAP).

**LTRC** was recognized by the Association for Talent Development as an ATD “Champion of Learning” for its successful implementation of Employee Learning Week in December 2023.

**LTRC Section 33** participated in DOTD’s annual “Take Our Daughters and Sons to Work Day” on April 25.

**Garrett Wheat, Ph.D.**, LTRC’s Statewide Strategic Program Manager, presented “Building a Competency Model for Diverse Work Environments” for the ATD National Conference in May.

**Vijaya (VJ) Gopu, Ph.D., P.E.**, LTRC’s Associate Director of External Programs, partnered with leaders from the US Department of Agriculture, West Virginia University, and others to host the USDA-FS Symposium “Build It Back Better with Wood: Connecting Urban & Rural Communities with Innovation.” The symposium was held online on April 17-18, 2024. Dr. Gopu was also interviewed by the *New York Times*, *Baltimore Banner*, and a local television station in Lafayette for his expert input on the recent collapse of the Francis Scott Key Bridge in Baltimore.

**Zhong Wu, Ph.D., P.E.**, LTRC’s Accelerated Pavement Research Program Manager, delivered a talk on “Evaluation of Louisiana Maintenance and Rehabilitation Treatment Decision Matrix for Pavement Preservation” at the 2024 Southeast Pavement Preservation Partnership Meeting in Hot Springs, Arkansas, on March 19-21.



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## Technology Today

### *Publication Statement*

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Technology Today is a quarterly publication of the Louisiana Transportation Research Center, administered jointly by the Louisiana Department of Transportation and Development and Louisiana State University.

For additional information on material included in this newsletter, contact the public information director at 225-767-9183.

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