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UPCOMING EVENTS

Sign Technician Level 1 Training
April 16-17, TTEC 100

*National Highway Institute Course No. 132012—
Soils and Foundations Workshop*
April 22-25, TTEC 100

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

RESEARCH

Louisiana Partners with Texas Researchers to Test Proposed Bridge Barriers

Planned median barriers prove effective in meeting crash impact standards

With over 12,000 bridges across the state, including four of the five longest over-water spans in the United States, bridge safety is a high priority for the Louisiana DOTD. As the department prepares to construct new median barriers on several of the state's I-10 bridges, LTRC researchers partnered with our neighbors to the west to test the safety and effectiveness of multiple proposed designs. Utilizing the safety performance criteria established by the American Association of State Highway and Transportation Officials (AASHTO) and proposed designs provided by DOTD Bridge Design engineers, the research team evaluated four planned design types, determining that all four met the crash safety standards and should be greenlighted for construction.

William Williams, P.E., of the Texas A&M Transportation Institute (TTI) in College Station, Texas, was the lead researcher on the project entitled "MASH TL-4 Engineering Analyses and Detailing of 36-Inch and 42-Inch High Median Barriers for DOTD."

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Louisiana's Bridges By the Numbers

13,000

There are nearly **13,000** bridges across the state*, including more than **150** movable bridges.

11

There are **11 bridges** in the state that cross the **Mississippi River**.

23.875

The **Lake Ponchartrain Causeway** is the longest over-water bridge in the United States at **23.875 miles**.

3

Three of the state's other bridges (**I-55 Manchac Swamp Bridge**, **I-10 Atchafalaya Basin Bridge**, and **I-10 Bonnet Carre Spillway**) also rank among the nation's five longest.

167

The highest bridge in the state is the **Horace Wilkinson Bridge** in Baton Rouge, which towers **167 feet** over the Mississippi River below.

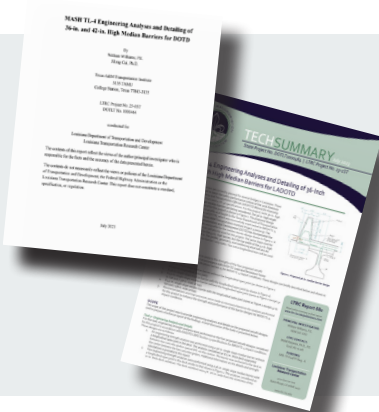
**This figure reflects the combined total of all state- (7,900) and locally-owned (5,000) bridges.*

In partnership with LTRC's Walid Alaywan, Ph.D., P.E., and engineers from DOTD's Bridge Design section, Williams drew on TTI's 2010 research analyzing crash testing on the Texas Department of Transportation's single-slope traffic rail design (SSTR), a prototype for the proposed Louisiana barriers, with the goal of analyzing their strength to withstand various levels of impact.

Four total designs were tested—two at 36-inches high (with and without longitudinal open joints) and two at 42-inches high (also with and without longitudinal open joints)—to compare their respective strengths and determine their suitability for use on Louisiana's many bridges. This thorough testing process, which implemented AASHTO's Load and Resistance Factor Design (LRFD) Bridge Design Specifications, included crash impacts on both sides of the proposed barriers and on each barrier's end-point and mid-span.

After completing this series of tests and analysis, Williams and his team concluded that each of them satisfactorily met the AASHTO safety performance criteria under the crash impact conditions in question. In his final report, Williams noted that if the barriers produced and installed on Louisiana bridges are at least forty feet in length, DOTD engineers can be confident that they will meet the recognized industry safety standards, providing the state's drivers with the safest possible conditions as they travel the state's highways and bridges.

The benefits of Williams' research extend well beyond driver safety. He explains that such a proactive approach to bridge barrier construction also helps the state economically: "Implementing the results of the study will save (DOTD) tens of thousands of dollars in foregoing all crash tests necessary to meet MASH TL-4 criteria." This combination of human and economic impact makes Williams' and his team's work in this project invaluable to Louisiana's unique transportation infrastructure.



For more information on this project and its findings, please visit www.ltrc.lsu.edu/pdf/2023/FR_680.pdf to find **Final Report 680**. You can also contact **Walid Alaywan, Ph.D., P.E.**, at (225) 767-9106 or walid.alaywan@la.gov.

TRAINING

LTRC's Dr. Gopu Collaborates with Professors Nationwide to Facilitate Webinar

Vijaya (VJ) Gopu, Ph.D., P.E., LTRC's Associate Director of External Programs, recently convened a nationwide panel of engineering experts to facilitate a series of webinars on the growing use of composite materials in the nation's transportation infrastructure.

This free learning opportunity, entitled "Intro to FRP Composite Materials, Applications, Durability, Property Testing and Computations," was hosted in conjunction with the 15th anniversary of the launch of the Center for Integration of Composites into Infrastructure (CICI), with which Dr. Gopu has been involved since its inception.

The webinar series was hosted virtually through LTRC and featured representatives from West Virginia University, University of Miami (FL), North Carolina State University, and Texas A&M University's Engineering Experiment Station (TEES).

Dr. Gopu reflects on his work with this distinguished group and his hopes for continuing to educate the transportation community on the advances in composite materials technology:

What motivated you to organize this webinar series, and what group(s) do you hope to reach through it?

For the past 15 years, I have been working with the CICI, including all of the presenters in this webinar series, to educate the transportation community about the advances in composite technology and their potential impacts to improve our aging infrastructure.

Continuing education opportunities like this one are targeted toward a wide range of transportation officials, including state DOT engineers in all fifty states, materials manufacturers, and other key stakeholders in the industry.

"As the research arm of DOTD, we are always seeking ways to educate the transportation community about new technologies and best practices."

*VJ Gopu, Ph.D.
Associate Director,
External Programs*



Why are advances in composite materials important to the future of the transportation industry? How are they positively impacting our state's and nation's infrastructure?

Composites are very expensive, and they have traditionally been used in large-scale aerospace projects like aircraft. As Louisiana and other states' transportation infrastructure ages and deteriorates, however, we are learning that composite materials can be effectively used for targeted repairs on roadways, bridges, and the like.

Rather than going through the extensive time and expense of a full replacement, engineers can now utilize composites to execute specific, strategic repairs. This both lowers costs and contributes to a more durable transportation infrastructure.

How do continuing education opportunities like this promote and advance the mission of LTRC?

As the research arm of DOTD, we are always seeking ways to both improve the quality and durability of Louisiana's transportation system as well as educate the broader transportation community about new technologies and best practices.

Webinars like this benefit everyone involved—state DOTs, industry experts, the university's researchers, and more. All end-users learn and grow when they make the time to participate.

Are you working on any other continuing education opportunities that you would like to share with us?

The CICI plans to continue offering opportunities like this one over the coming year and beyond. It is our hope to host approximately six to eight additional webinars this year. Many are already in the works through our partners at the University of Miami (FL).

We are also making the courses available on demand through YouTube so they can be accessed by anyone in the transportation industry at their convenience.

COMMUNITY

LTRC Hosts MATHCOUNTS 2024 Regional Competition

A host of aspiring young scientists, mathematicians, and engineers descended on the LTRC campus on Friday, February 2, for the MATHCOUNTS 2024 Baton Rouge Regional Competition, held in the auditorium at LTRC's Transportation Training & Education Center.

MATHCOUNTS is a nationwide coaching program designed to stimulate student interest in mathematics. It also includes a series of regional, state, and national competitions for middle school students interested in elevating their math knowledge and skills. The local Baton Rouge event was sponsored and coordinated by the Louisiana Engineering Society (LES), and its top performers advanced and joined others from across Louisiana for the statewide competition in Pineville on March 15. The best-performing students and teams in the state will have the opportunity to travel to Washington, DC, in May to compete nationally.

The local MATHCOUNTS competition featured a series of four fast-paced rounds—sprint, target, team, and countdown—challenging individual students and local middle school teams to utilize their burgeoning math skills in a variety of distinctive ways. Gavin Gautreau, LTRC's Senior Geotechnical Research Engineer and a leading MATHCOUNTS supporter, explains how it works and why it matters: "This is a fun, fast-paced competition that focuses on speed and accuracy to promote mathematics and encourage the engineers of tomorrow."

This year's winning local teams were from Glasgow Middle School, St. Thomas More School, and Episcopal School of Baton Rouge. Top individual honors included students from Glasgow Middle (Ziang Z., Jason Z., Adhrit M., and Alexander W.) and St. Thomas More School (Oscar F.). Congratulations to these talented and hard-working young mathematicians, and best of luck to them as they advance to compete against others around the state and across the nation this spring!





TRAINING

LTAP Director Steve Strength Celebrates Retirement

After serving Louisiana's transportation needs in various capacities for over four decades, Steve Strength, director of the Local Technical Assistance Program (LTAP) at LTRC, celebrated his well-earned retirement from state government in February of this year. Following a 32-year stint with DOTD District 02 in New Orleans, including over 20 years serving as district traffic engineer, Strength joined LTAP in 2013 as program manager and has served as its director since 2019. In his role leading LTAP, Strength and his dynamic team provide a broad and diverse array of training and technical assistance services to parish and municipal officials across Louisiana. Steve reflects on his illustrious career in transportation services below.

How did your career in transportation begin?

I have always had an affinity for all things transportation—cars, trains, planes, and the like. I studied civil engineering, and when it came time to find my first job, I thought transportation would be a great fit.

What is the most significant change you have seen in transportation services over the course of your career?

When I started working with DOTD in the early 1980s, much of the focus had been on building the state's transportation infrastructure. Starting early in my career, the focus shifted much more to maintenance, operations, things like that. We had to figure out how to best maintain and manage everything we had built to serve the state's needs!

What has been the most enjoyable and rewarding aspect of your tenure at DOTD and LTAP?

I have been privileged to be a part of many important and exciting projects over the years. Two that stand out especially are the planning, building, and opening of the Regional Transportation Management Center in New Orleans in 2009. That was the outcome of many years of work that involved the contributions of so many people. In my role at LTAP, I have really enjoyed getting to draw on my years of experience in the industry to help the locals get the training and resources they need. It is really rewarding to transfer the knowledge I have gained to others.

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In my role at LTAP, I have really enjoyed getting to draw on my years of experience in the industry to help the locals get the training and resources they need.”

*Steve Strength,
LTAP*

How do you hope your team will continue to build upon your expertise and accomplishments?

I hope our team will continue to build on the collaborative relationships we have built around the state over the past decade. Being intentional with outreach and investing in these partnerships is central to the work we do at LTAP. I’m also confident that our people will continue to explore new and even better ways to serve the locals. I believe in our work and always want it to grow and improve.

What are you most looking forward to in your retirement?

I’ve certainly got plenty of projects to do around my house. I look forward to traveling and spending more time with my family. I also enjoy working on cars for fun, so I guess I won’t be leaving transportation completely!

Congratulations to Steve on this wonderful accomplishment and a fantastic career!



STAFF NEWS

Updates and Accomplishments

Garrett Wheat, Ph.D., presented “AI for Hotel Professionals” for the Visit Lake Charles’ hotel professional meeting on February 8 at the Horseshoe Lake Charles hotel (*pictured at right*), as well as “Building a Competency Model for Diverse Work Environments” at the ATD Baton Rouge Chapter monthly meeting on February 27.

Marcus Sylvas, Ph.D., and **Garrett Wheat** presented “On Self-Awareness in Leadership Across Generations” virtually to the Louisiana Department of Health Mentorship Cohort on February 27.

Steve Strength, P.E., **Courtney Dupre**, and **Leo Marretta** of LTAP assisted FHWA in hosting the Task Order Working Group (TOWG) kickoff meeting on Local and Rural Road Safety at the Regional Transportation Management Center in New Orleans on February 21-22, 2024. The group is reviewing revisions to FHWA Safety Manuals for Rural Local Road Owners on Roadway, Intersection, and Pedestrian/Bicycle Safety, as well as Speed Management practices. The group included 27 participants from FHWA, LTAP centers, counties, and tribal nations. Steve Strength presented an overview of the Louisiana SHSP Roadway Departure efforts to the group, while Dupre and Marretta helped with meeting logistics.

Steve Strength participated in the NCHRP Panel for Project 17-24, “Effectiveness of Speed Limit Reductions in Work Zones,” and attended the first two panel meetings in Washington, DC.



PUBLICATIONS

Recently Published

Project Capsule 24-1GT

Evaluation and Incorporation of Site and Laboratory Variability into LRF Design of Pile Foundations, Phase 2

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

Project Capsule 24-2GT

Web-Based Tool to Advance Geotechnical Data Interchange and Reliability-Based Site Characterization

Gavin P. Gautreau, P.E.



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