



RESEARCH

20 Years and Counting: LTRC-Led Geotechnical Database Project Advances to New Phase

Pavement and Geotechnical Research Administrator Gavin Gautreau, P.E., came to LTRC in the early 2000s with 10 years of private-sector engineering experience. Not long after his arrival, he began work on a sweeping research project that continues to grow more than 20 years later. The development of a statewide geotechnical database, a decades-long collaborative effort between LTRC and Louisiana DOTD's Pavement and Geotechnical Section, is entering its sixth phase in 2026 as Gautreau and his research partners continue to adapt to an ever-changing technological landscape.

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SPOTLIGHT

LTRC Welcomes Amar Raghavendra as New Associate Director of Research

In June 2026, LTRC welcomed Amar Raghavendra, P.E., as its new Associate Director of Research. Raghavendra, an LTRC alumnus who has served Louisiana DOTD in its Materials Lab for the past nine years, returns to oversee the expansive research activities happening at the center on an everyday basis. Amar recently sat down with LTRC's Publications Team to discuss the experience he brings to his new role and his vision for continuing to build on the center's distinctive research legacy...

What is your background, including your prior stint at LTRC? How do you believe these experiences have prepared you for your new role?

I have a Bachelor's degree in Electrical/Electronics Engineering and a Master's degree in Electrical Engineering. I started in LTRC's asphalt laboratory, developing software to collect data for the force-ductility test, and maintaining

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UPCOMING EVENTS

Conflict Management
October 15, TTEC 175

NHI Advanced Work Zone Management & Design
October 27-28, TTEC 100

To view more events, please visit
<http://www.ltrc.la.gov..>

and customizing testing equipment to support research. Later, I was involved in the whole research cycle, including proposal development, conducting testing and data analysis, and publishing results. I am especially proud of the work I did for the NCHRP 20-07 proposal led by Dr. Mohammad. This research helped improve AASHTO's loaded wheel tracker test procedure. Later, an opportunity to work with concrete gave me valuable experience and insight into the challenges of that world.

In 2017, I moved to the Materials Laboratory at DOTD Headquarters, where I worked in automation and later in management. Those roles gave me valuable exposure to construction operations across the state. I worked closely with district laboratories, construction offices, and consultants, gaining firsthand knowledge of how specifications, materials, and testing practices affect projects. I also gained experience supervising staff, assisting with budget development, supporting accreditation, and implementing new technologies such as e-ticketing and construction management systems. I believe this combination of research, field operations, and management has prepared me well for this role. It allows me to understand not only how to conduct quality research, but also how to ensure that research addresses real-world needs.

What is most compelling to you about the opportunity to return to LTRC in this capacity?

What excites me most is the opportunity to shape research that directly impacts DOTD operations and the people of Louisiana. Although I spent several years in the Materials Laboratory, I remained closely connected with LTRC during that time through research projects, pilot studies, and field evaluations. That experience reinforced my appreciation for the quality of work being done here and the talented people who make it happen. Returning to LTRC gives me the opportunity to combine what I have learned in research with what I have learned supporting construction statewide. Ultimately, what motivates me is helping DOTD make better decisions through innovative research.

How would you characterize the value of the research being done at LTRC?

LTRC provides DOTD with an objective, science-based foundation for making engineering decisions. Whether we are evaluating new materials, developing specifications, or testing emerging technologies, our goal is to identify cost-effective materials or technologies, reduce maintenance costs, and improve the long-term performance of our infrastructure. Ultimately, the beneficiaries are Louisiana's motorists. Research helps DOTD make better use of limited resources, leads to safer roads, and makes more cost-effective use of taxpayer dollars.



How do you believe you and the Section 19 team can continue to build on LTRC's 40-year legacy of excellence?

LTRC already has an outstanding reputation, and my goal is to build on that strong foundation. I believe our greatest asset is our people, so continuing to invest in staff development, mentoring, and encouraging networking with other states to maintain technical expertise will be a priority.

Looking ahead, I see several exciting opportunities. First, I believe we can better measure the impact of our research by tracking the long-term performance of pavements and structures and using that information to guide future research priorities. Second, I believe we should continue expanding partnerships with FHWA, industry, and other state DOTs to increase funding opportunities and knowledge sharing. I am also excited about the potential of the Accelerated Loading Facility (ALF). It enables us to evaluate full-scale pavement systems much more quickly than traditional methods, allowing us to validate new technologies before widespread implementation. Additionally, I believe we should continue exploring new fields such as artificial intelligence and other emerging technologies to improve both research and operations. By combining outstanding people, practical research, and a strong focus on implementation, I believe LTRC can continue to make an impact over the next 40 years.

What do you see as your greatest strengths as a leader, and how do you plan to leverage them at LTRC?

I believe my greatest strength is my ability to connect research and practical implementation with data-driven decisions. Having worked in both research and construction has given me a strong appreciation for how laboratory decisions ultimately affect field operations. I also believe in being a transparent leader. I try to involve more people and perspectives in decision-making whenever appropriate because it leads to better decisions. By continuing to invest in our people while keeping our research closely aligned with DOTD's needs, I believe LTRC will deliver meaningful improvements to Louisiana's transportation system.

“The Driving Force” Podcast Spotlights Key People and Projects Across LTRC and DOTD

It started with a simple comment in a staff meeting.

In a 2024 discussion about LTRC’s technology transfer initiatives and opportunities, Statewide Strategic Program Manager Garrett Wheat quipped, “Wouldn’t it be cool if we could produce a podcast to share what’s happening here at the center?” Across the room, Manager of Technical Publications Todd Blount replied that he had some prior podcasting experience and would be glad to share his knowledge if the conversation progressed.

From that brief exchange, Blount and Wheat (*pictured at right*) worked over several months to develop a production and launch plan for what would ultimately become “The Driving Force,” a podcast hosted at LTRC and one of the center’s newest technology transfer innovations. The pair’s goal in this production is “to highlight the trailblazing people and groundbreaking projects driving change in Louisiana transportation.” As of this publication, since its start in January 2025, they have published more than 40 episodes featuring LTRC staff members across both its research and technology transfer sections, as well as leaders from several other Louisiana DOTD sections, including Innovative Procurement, Highway Safety, Multimodal Commerce, Pavement and Geotechnical, and Bridge Maintenance.

Each episode of the show introduces listeners to the people who comprise the LTRC and DOTD community, providing a platform for them to share who they are, what they do, and the impact their work has on the transportation community at large and the traveling public across our state. Because DOTD is such a large organization with many diverse functions, these “snapshots” can help Department employees better understand their colleagues’ work and how their own responsibilities are situated within the organization’s overall mission and structure. For those outside the Department, whether private industry leaders or simply Louisiana citizens, the conversations featured on the podcast provide a “behind the scenes” look at the important things happening in Louisiana transportation, along with a human connection with those doing that work every day.

Wheat says he thoroughly enjoys the opportunity to talk with such a wide range of talented, hard-working people: “For the decade plus that I’ve worked at DOTD, I’ve told my friends and family about how much work is being done regarding our infrastructure that is never seen. It is amazing how incredibly intelligent and innovative those working at every level of the Department are. I love hearing about the unique projects they’re completing, as well as the nuanced information about their work that many of us take for granted. I’m always amazed by what is happening in the transportation industry and hope the conversations we host highlight for others what we see every day.”

Blount echoes these sentiments: “Our hope is that this show educates people across Louisiana about all that goes into administering our expansive statewide transportation program, as well as creating a genuine appreciation for the skilled, dedicated public servants who invest their time and energy to do their work each day with excellence.”

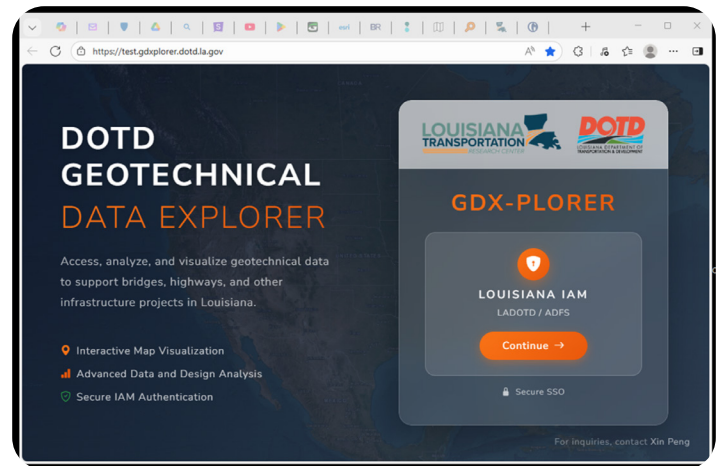
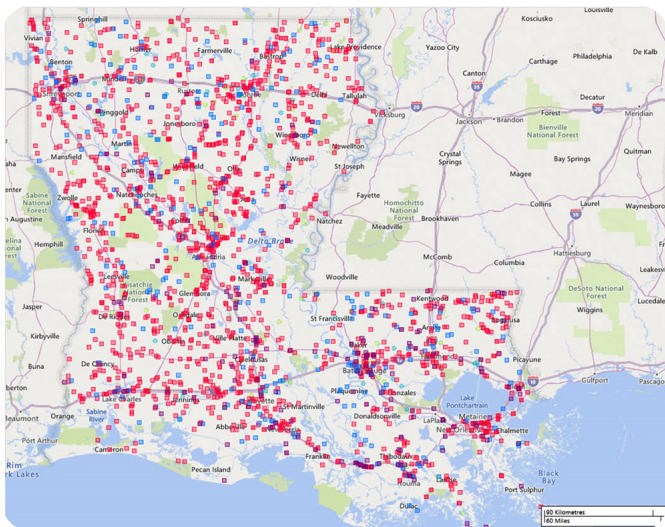
Episodes of “The Driving Force” are available on all major podcasting platforms, including Apple and Spotify. If you have questions or recommendations for the show, please contact **Garrett Wheat** at garrett.wheat@la.gov or **Todd Blount** at todd.blount@la.gov.



From its infancy to today, the overall goal of this project has remained the same: to digitize the wealth of geotechnical data collected across Louisiana throughout DOTD's history, making it both accessible and useful to the state's transportation leaders. Examples of such data include deep and shallow soil boring logs, pile load test results, cone penetration test results, slope repair information, and the like. This information aids engineers and decision-makers in a wide variety of design, construction, maintenance, and rehabilitation efforts on Louisiana's transportation infrastructure.

This research has significant economic benefits for Louisiana. For example, the borehole and Cone Penetration Test (CPT) data within DOTD's geotechnical OpenGround Cloud database is an asset worth millions of dollars. Each boring costs approximately \$25,000 to \$30,000 to conduct, including the costs of lab testing, traffic control, and engineering. The current database has roughly 2,700 projects; each project generally contains at least one boring log, with few exceptions, and a typical project averages more. If this were created from scratch, it would cost at least \$65 million.

Over the past 23 years, incredible strides have been made in this effort. Prior to the digital age, all geotechnical records were kept as hard copies, making them difficult to store efficiently and even more challenging to access with ease. What initially began in 2003 as an effort to provide a few historical records in PDF format via a GIS interface shifted to digital data in 2010, created a Geotechnical Database for DOTD in 2021 (*pictured below*), and progressed into an ever more robust database with a web-based tool that provides engineers and others scores of data in a user-friendly format.



Shifts and advances in software have driven many of the changes throughout the project's lifespan. Starting in 2010, LTRC and DOTD partnered with Dataforensics to leverage several tools to develop a standardized data template within Bentley's gINT and using PLog Enterprise. Over the years, organizing data and implementing data governance protocols has been key. DOTD also began using newer geotechnical database software: Keynetix's HoleBASE and KeyLAB (acquired by Bentley in 2019), and OpenGround Cloud. Most recently, in Phase V of the project, Xin Peng, P.E., of Geosyntec helped develop a custom analysis software called Geotechnical Data Explorer, or GDX-plorer (*pictured above*).

GDX-plorer is a tool that DOTD can use to analyze data within its OpenGround Cloud geotechnical database to address site variability and the associated statistical calculations required by upcoming AASHTO Section 10 updates. Additionally, GDX-plorer will allow DOTD and its consultant partners to exchange data and analyses and perform cross checks to ensure that appropriate pile resistance factors are used in design.

Gautreau explains: "The various phases of the LTRC research project developed tools to improve data access, increase the efficiency of designers, and create a database and other useful tools not only for designers, but for consultant partners, LTRC researchers, and future DOTD engineers, supporting succession planning within the Department."

The LTRC research team has adopted a forward-thinking approach to software. The project's most recent phases have focused on aligning the DOTD geotechnical database with the latest software capabilities and taking the most significant steps toward creating a publicly accessible data portal, which the research team anticipates being available for launch by 2028.

These steps have included ensuring that Louisiana's data is compatible with the DIGGS (Data Interchange for Geotechnical and Geoenvironmental Specialists) standard recently adopted by the Federal Highway Administration (FHWA) and the American Society of Civil Engineering (ASCE). DIGGS is a data transfer protocol that allows users to share data across software, even from different providers. DOTD is taking a software-agnostic approach, planning to require a DIGGS-compatible file as a deliverable from consultant partners, rather than a vendor-specific data file.

Gautreau, Peng, and Jesse Rauser, P.E., DOTD's Geotechnical Unit Supervisor, believe that the data and its proper governance are more critical than software, as software can come and go over time. If the data is properly organized and governed, new software can tap into it as necessary. "We don't want people to just associate

geotechnical data management with archiving old data that we don't plan to use anymore. If we build the right tools, we can leverage data to expedite processes during all phases of our projects," says Rauser.

Gautreau and Rauser hope to implement additional innovative tools in the future to connect and visualize DOTD data, including expanding the use of Leapfrog Works, Plaxis finite element software, and custom software to enhance the visualization of soil-boring and driven-pile data.

A summary of the geotechnical database research is included below. Links to the Final Reports and Technical Summaries can be found at www.ltrc.la.gov/pubs_final_reports. The capsule for the current phase of the project is available at www.ltrc.la.gov/pubs_projectcapsules.

LTRC Geotechnical Database Research Summary

Development of a Geotechnical Information Database

LTRC Project 03-1GT | Final Report 446

Geotechnical Information Database—Phase II

LTRC Project 10-2GT | Final Report 498

Geotechnical Information Database—Phase III—pLog Enterprise GIS-based Geotechnical Data Management System Enhancements

LTRC Project 15-1GT | Final Report 634

Geotechnical Database—Phase IV

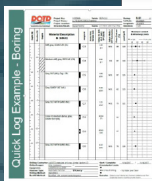
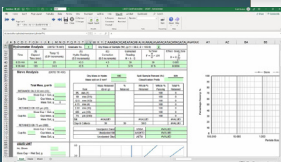
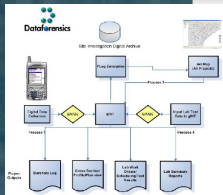
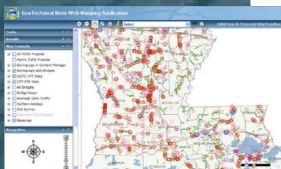
LTRC Project 21-2GT | Final Report 714

Geotechnical Database V—GEC-5 Web-based Tool to Advance Geotechnical Data Interchange and Reliability-based Site Characterization

LTRC Project 24-2GT | Final Report 726

Geotechnical Database VI—Public Access + Scan and Digitize

LTRC Project 26-2GT | Final Report TBD



SPECIAL EVENTS

Louisiana Transportation Conference 2027: Registration Now Open!

The Louisiana Transportation Conference 2027 is rapidly approaching, and registration is now open to all attendees, including DOTD employees and retirees, Louisiana government and university employees, and private industry representatives. This dynamic event will be held on March 7-10, 2027, at the Raising Cane's River Center in downtown Baton Rouge. In keeping with DOTD's ongoing emphasis on transformation, this year's conference theme is **Transforming Transportation: Moving Louisiana Forward**.



LTC is a biennial gathering of transportation leaders across Louisiana and beyond designed to promote technology transfer and the exchange of ideas among members of the community's public and private sectors regarding policy, practice, and problems. The conference features three days of invaluable opportunities to learn, grow, and connect with others, including a general session, transportation awards, 70+ technical sessions, and a broad-ranging tradeshow highlighting the latest opportunities and innovations in the transportation industry. The 2025 conference welcomed over 1,500 participants.

For more information and to register for LTC 2027, visit the conference website at ltrc.la.gov/ltc_27. For program-related questions, contact **Garrett Wheat** at garrett.wheat@la.gov. For registration-related questions, contact **Layne Brown** at layne.brown@la.gov.

PUBLICATIONS

Recently Published

Final Report & Tech Summary 724 (Project 24-4SS)

Improved Signalized Intersection Performance Using Computer Vision and Artificial Intelligence
Milhan Moomen, Ph.D.; Xiangyu Meng, Ph.D.;
Tonmoy Sarker; Jones B. Essuman; Collins Addo

Final Report & Tech Summary 725 (Project 24-2SS)

Trip Generation for Various Sites
Ruijie "Rebecca" Bian, Ph.D., P.E.; Peter R. Stopher, Ph.D.;
Hany Hassan, Ph.D., P.E.; Abdullah Bayomi, MSc.

Final Report & Tech Summary 726 (Project 24-2GT)

Web-Based Tool to Advance Geotechnical Data Interchange and Reliability-Based Site Characterization
Gavin P. Gautreau, P.E.; Xin Peng, Ph.D., P.E.; Murad Abu-Farsakh, Ph.D., P.E.; Masoud Nobahar, Ph.D., E.I.

Final Report & Tech Summary 727 (Project 23-1GT)

LiDAR for Geotechnical Applications
Gavin P. Gautreau, P.E.; Masoud Nobahar, Ph.D., E.I.

Final Report & Tech Summary 728 (Project 25-2SS)

Truck Parking Shortage: Improving Efficiency and Identifying Opportunities
Bethany Stich, Ph.D.; Faisal Mallum, Ph.D.

Final Report & Tech Summary 729 (Project 22-1B)

Evaluation of Saturates/Aromatics/Resins/Asphaltenes (SARA) Fractionation of Asphalt Binders in Louisiana
Saman Salari, P.E.; Moses Akentuna, Ph.D., P.E.



VIEW ONLINE

To download a complete list of publications, visit the LTRC website at www.ltrc.la.gov.

Updates and Accomplishments

Congratulations to **Chad Winchester, P.E.**, DOTD Chief Engineer, on his retirement from DOTD in July 2026.

Welcome, **Angela LeMay**, to Section 33! Angela is serving as Asphalt Concrete Mixtures (ACM) Program Technician on the Internal Training Team.

Courtney Dupre, M.A., was chosen as the 2026 National Program Achievement Award winner at the NLTAPA Annual Meeting in July 2026 (*pictured below*). This award is presented to individuals in recognition of their dedication, leadership, and effectiveness in promoting the goals and purposes of the National Local and Tribal Technical Assistance Program through service to the NLTAPA organization.

Masoud Nobahar, Ph.D., and **Murad Abu-Farsakh, Ph.D., P.E., F.ASCE**, recently published a new paper entitled “Development of Bayesian-Based Solution to Update the Resistance Factors of Piles Using Combined Static and Dynamic Pile Load Test Results” in the *Canadian Geotechnical Journal*.

M. Ashifur Rahman, Ph.D., has been appointed to serve on the panel for NCHRP Project 20-149, titled Establishing Operating Characteristics for Non-Motorized Road Users.

Gavin Gautreau, P.E., completed his term as the Louisiana Engineering Society (LES) State President for the 2025-26 term and now serves as the 2026-27 LES Past President. Additionally, he is serving as the Louisiana Engineering Foundation (LEF) President for the 2026-28 term.

LTRC received an AASHTO High Value Research Award for the project “Development of Statewide Design Guidelines for Improving Pedestrian Safety on High-Speed Arterials in Louisiana. The principal investigator on this study was **Hany Hassan, Ph.D.**, and the project manager was **Elisabeta Mitran, Ph.D.**





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