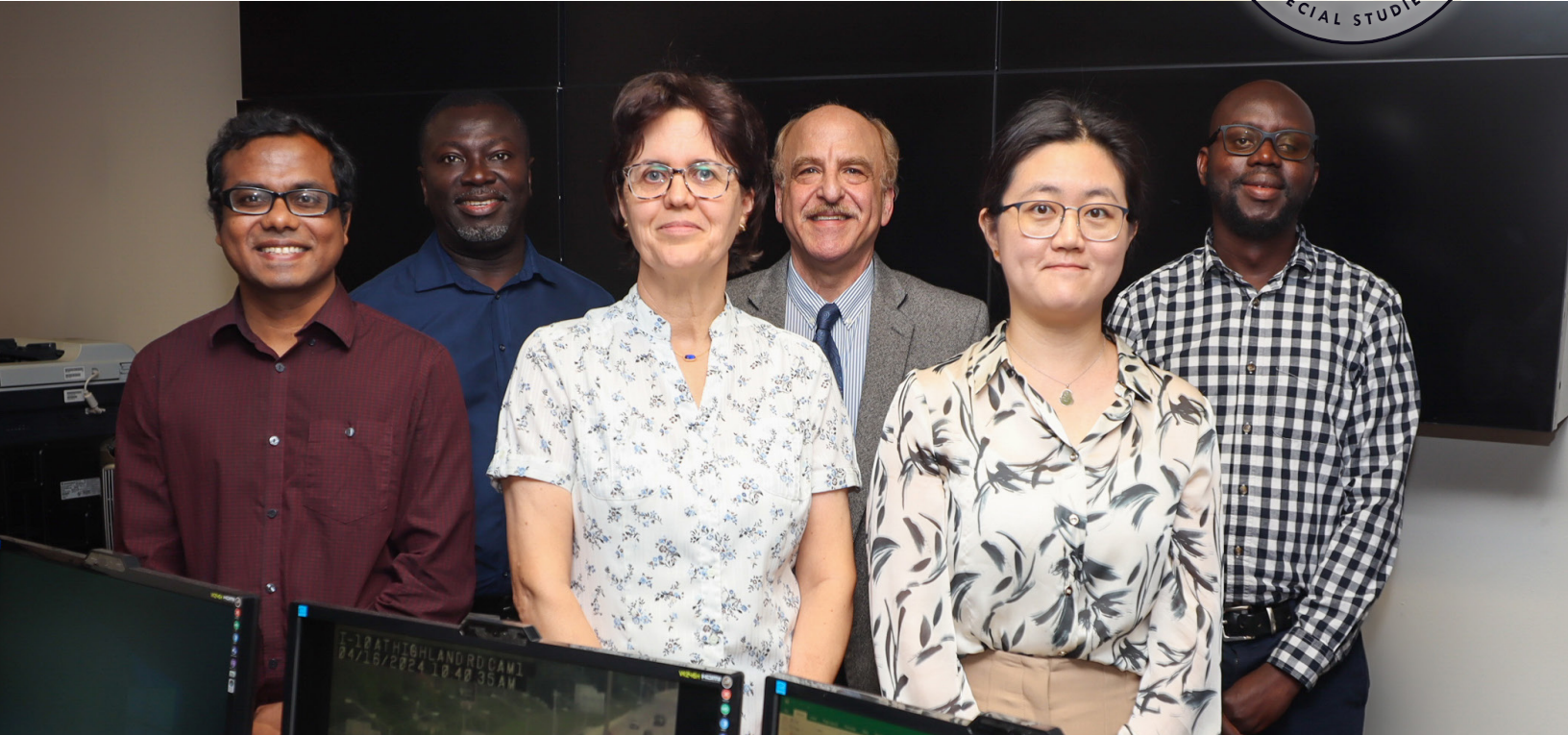




TECHNOLOGY TODAY

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Meet Special Studies (left to right): Ashifur Rahman, Julius Codjoe, Elisabeta Mitran, Walid Alaywan, Ruijie "Rebecca" Bian, and Milhan Moomen

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UPCOMING EVENTS

Roads Scholar #3: Drainage—The Key to Roads that Last
May 22, TTEC 100

NHI Course No. 130102—Engineering for Structural Stability in Bridge Construction
June 3-5, TTEC 100

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

RESEARCH

Special Studies: Driving Innovation for Safer and Efficient Transportation

Transportation research is commonly thought of in terms of constructional elements such as pavement, concrete, asphalt, or structures. However, researchers in the Special Studies section at the Louisiana Transportation Research Center (LTRC) demonstrate that transportation research is more than meets the eye—or roadway and bridge. By providing solutions to the challenges of safety, overcrowded roads, and sustainability, Special Studies works to ensure reliable and efficient transportation systems for all modes of travel.

Special Studies Research Administrator Julius A. Codjoe, Ph.D., P.E., explained, “Special Studies research at LTRC mainly encompasses planning and intermodal research, intelligent transportation systems (ITS) and traffic research, and safety research. Special Studies also routinely involves operations and policy work as well, and has recently added structures research under its umbrella. We routinely undertake Technical Assistance work for other DOTD divisions and also for the

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executive leadership to support responses to legislative requests. Each of the disciplines within Special Studies offers beneficial elements that help provide safe and efficient transportation services for all in Louisiana.”



Dr. Codjoe has been the Special Studies Research Administrator for almost four years. Over that time, he has recruited and assembled a skilled team of data engineers, technology experts, and scholars. Three of the branches within Special Studies are each managed by an assistant research professor. Deciphering traffic, crash, and video data at the ITS lab are Milhan Moomen, Ph.D., and M. Ashifur Rahman, Ph.D. Planning and intermodal research is led by Ruijie Bian, Ph.D., P.E., while

safety research is led by Elisabeta Mitran, Ph.D. The newest addition to Special Studies is Senior Structures Research Engineer Walid Alaywan, Ph.D., P.E., who brings decades of civil engineering experience and works to find solutions to problems that bridges are facing by using new concepts and/or new innovative materials.

As the former LTRC ITS/Traffic Program Manager, Dr. Codjoe leads his team from a place of experience, technical knowledge, connection, and genuine concern for Louisiana drivers. “All areas of research within LTRC strive to make lives better for Louisiana citizens. Special Studies loves to collaborate and also loves when our LTRC and other DOTD colleagues approach us whenever they see an opportunity for us to work collaboratively,” Dr. Codjoe said. He also serves as a board member of the Gulf Region Intelligent Transportation Society, a multi-state organization consisting of industry leaders and ITS advocates from Mississippi, Louisiana, and Alabama, who are committed to partnerships, education, and the advancement of transportation throughout the Gulf region.

As Special Studies continues to grow and evolve, Dr. Codjoe hopes their group’s contributions will permeate all DOTD divisions and units and continue to positively impact the lives of Louisiana citizens and beyond. For instance, with the advent of connected and autonomous vehicles (CAV), Special Studies is researching not only how this emerging technology will improve transportation in Louisiana but also what this means in terms of additional responsibilities to be borne by DOTD and other local transportation agencies. Currently, all Special Studies staff are active panel members of projects funded by the National Cooperative Highway Research Program (NCHRP) and belong to several nationally recognized professional bodies.



Welcome Walid Alaywan, Ph.D., P.E.

Dr. Alaywan has over 27 years of experience at the Louisiana Transportation Research Center. He first began in the asphalt area, relocated to the structures area in the Special Studies group, then was reassigned to the Materials Group. Now, finally back with Special Studies, he is familiar with how the system works. “My job entails conducting research, developing requests for proposals, setting up project review committees, approving invoices, and reviewing final reports for Structures-related research, in essence, from inception to completion,” explained Dr. Alaywan.

Having secured over \$1.5 million for research through working with the federal government, he hopes to do the same in his new group and looks forward to working with his new team. “It is only through interaction with others that a person can continue to learn and continue to grow while sharing experience,” he explained.

In memory: Special thank you to former Special Studies Research Administrator Kirk Zeringue, whose pioneering efforts helped lay the foundation for the Special Studies program before his untimely passing in 2020.



SAFETY

Researchers Explore Crash Characteristics and Speed Limits on Elevated Interstate Sections

Elevated sections of interstate highways can have higher incidences of personal injury and property damage, which is costly for state and federal governments. The limited access to these elevated sections, often with just one or two entry/exit points along the bridge, makes even minor crashes a concern for incident management. Louisiana has several major interstate sections that are elevated above land vegetation, roadways, swamp basins, and rivers. This includes the Atchafalaya Basin Bridge, an 18-mile stretch of a key Interstate 10 corridor connecting Baton Rouge and Lafayette. This bridge is a designated highway safety corridor, prompting the installation of safety measures. The LTRC safety team has studied crash characteristics and speeding patterns on similar major elevated interstate segments statewide.

M. Ashifur Rahman, Ph.D., and Elisabeta Mitran, Ph.D., spearheaded the study “Evaluation of Traffic Crash Characteristics on Elevated Sections of Interstates in Louisiana” with assistance from University of Louisiana at Lafayette graduate students, Kofi Kakyire Ampofo-Twumasi and Safkat Tajwar Ahmed. “Major crashes on elevated sections severely impact traffic delays which impacts our economy and efficiency,” said Dr. Rahman.

“The project utilized various approaches to analyze crash characteristics and hotspots as well as collect speed data on eight elevated

interstate sections in Louisiana,” said Dr. Mitran. “A comprehensive analysis of 10,022 crashes from 2015 to 2020 on all eight sites revealed a collision distribution of 47% rear-end, 20% single-vehicle, and 16% sideswipe.” Individual elevated section sites exhibited distinct crash characteristics, with rural sites having higher single-vehicle crash percentages and urban sites having higher rear-end crashes.



Based on the results of the speed analysis using the Regional Integrated Transportation Information System (RITIS) probe data platform, non-compliance with posted speed limits remains a common issue for both passenger vehicles and trucks throughout elevated interstate sections in the state. “Speeding up to 10 mph above the posted limit on average was observed on the segments of elevated sections that are directly connected to the higher speed limit non-elevated sections,” mentioned Dr. Rahman. “Speeding was lower in areas with sharp curvature and in areas with relatively high traffic volume where vehicles were merging or diverging.”

At the time of the research, the Atchafalaya Basin Bridge was the only elevated section in Louisiana subject to truck lane restrictions (requiring trucks to use the right lane only), and speed differential limits (55 mph for trucks and 60 mph for passenger cars). Using video footage analysis through the DeepMetrics software, the research team investigated the truck lane compliance rates on this bridge.

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IN THE LAB

ITS & Traffic Research Lab Q + A

The Intelligent Transportation Systems (ITS) and Traffic Research Lab team at LTRC houses projects where researchers focus on collecting, storing, analyzing, and retrieving data for research into multiple areas of transportation.

The ITS and Traffic Research team, Research ITS/Traffic Research Manager and Assistant Professor Milhan Moomen, Ph.D., and Research Associate M. Ashifur Rahman, Ph.D., recently sat down to give an in-depth look into the intricacies and capabilities of the ITS and Traffic Research Lab.

What does a day in the ITS & Traffic Research lab typically look like?

A typical day in the ITS lab involves students working on computers with specialized software known as DeepMetrics, which is used for data collection and analysis purposes. Students will load videos from cameras so that DeepMetrics will provide frequencies and categorizations. Students will then manually verify some frequencies manually and reconcile any differences that exist. The prepared data is then stored for further analysis.

What types of equipment are primarily used?

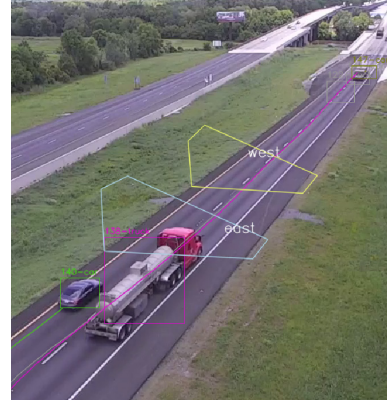
While the primary equipment used is computers, the ITS lab also utilizes cameras, traffic counting equipment, radar-based sensors, solar panels, batteries, chargers, video display wall, servers, and other assorted equipment.

What do you enjoy the most about ITS & Traffic Research?

Technology is developed at a rate faster than any of us can keep up with. The future is coming and the thoughts of how these innovations and technology will lead to new opportunities, improved safety, mobility, and transportation access is exciting to everyone. Being able to research into emerging technologies and how they may be used to improve transportation in Louisiana is what I enjoy most.

How does ITS & Traffic Research differ from other areas of research within LTRC?

Pavement, geotechnical, concrete, asphalt, and structures research deal with materials and the science of construction facilities. However, ITS and Traffic research focuses on the safe and efficient movement of goods and services across the transportation network by utilizing technology, data collecting, and processing capabilities.



DeepMetrics counts, classifies vehicles, and provides speed and driving directions based on images captured from videos. The software allows for more efficient estimates of traffic volumes on streets and highways, which was previously done manually by the side of the road.



Complete Streets: A Look into What Is Missing



Photo: City of Baton Rouge
(Complete streets vision and
policy statement pdf)

Picture streets where everyone feels safe, no matter how they travel or who they are. That's the vision of Complete Streets—roads designed for everyone, regardless of age, ability, race, or income level. Over the last decade, more than 1,500 agencies across the U.S. embraced these inclusive street policies. Since Louisiana has joined the movement, a recent study led by LTRC's Planning/Intermodal Research Manager Ruijie “Rebecca” Bian, Ph.D., P.E., M.ASCE., aimed to evaluate the impacts and effectiveness the Complete Streets policy of DOTD has had on the state.

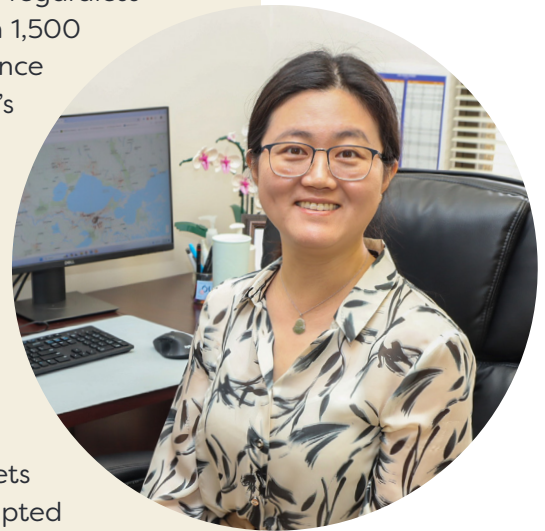
Dr. Bian explained, “We know relatively little about how successfully these policies have been implemented. This study focused on exploring Louisiana’s experience, seeing if the goals were met and what areas need improvement.”

The study's goals were specific: to evaluate how the Complete Streets policy affected different DOTD projects; how the government adapted its rules, documents, staffing, and training to make the policy real; and how the policy impacted Louisiana's streets. The study covered a wide range of factors to understand how well the policy worked, focusing particularly on pedestrian and bicycle facilities.

Researchers began by examining Louisiana’s policies, guidelines, and manuals to see how they changed over 10 years to fit the Complete Streets approach. They then looked at actual construction projects funded by the state between 2011 and 2020 to see if these changes showed up in practice. They investigated how often projects did not follow Complete Streets rules and why certain aspects, like sidewalks or bike lanes, were sometimes left out.

The research team developed a survey questionnaire and interview questions to collect stakeholders’ responses to the policy implementation, including assessment of policy comprehension and interpretation, perceptions of efficacy, and reflections on a decade of practice from a variety of viewpoints. “Stakeholders’ involvement is of vital significance to successful policy implementation. In addition, continuously engaging stakeholders in policy implementation evaluation is key to applying evaluation results successfully in practice,” explained Dr. Bian.

They also collected data from various sources to see how certain performance measures changed before and after these projects, considering both urban and rural settings.



“Overall, much progress has been made compared with where the state started in 2010. However, shifting agency culture to balance multimodal needs is a long-term process.” —Dr. Bian

The results revealed truck lane compliance rates ranging from 77.1% to 82.3% at selected locations with camera coverage.

The results of this study can guide the Louisiana Department of Transportation and Development (DOTD) in developing strategic safety countermeasures for elevated sections.



**This document, and the information contained herein, is prepared for the purpose of identifying, evaluating, and planning safety improvements on public roads, which may be implemented utilizing federal aid highway funds. This information shall not be subject to discovery or admitted into evidence in a Federal or State court pursuant to 23 U.S.C. § 407.*

To learn more about this project, please visit www.ltrc.lsu.edu/pubs_final_reports.html and select Final Report 683.

This study uncovered some important insights. It highlighted the need for ongoing efforts to update guidelines and ensure they are followed consistently. It also pointed out gaps in people's understanding of the policy and suggested ways to spread awareness and improve training. The study showed that, while progress had been made, there is still work to do to ensure everyone is aware of and supports the policy. "Overall, much progress has been made compared with where the state started in 2010. However, shifting agency culture to balance multimodal needs is a long-term process," said Dr. Bian.

Moreover, the research led to concrete recommendations for improvements. It suggested updating data systems, providing clearer guidelines for designs, and emphasizing the need for more outreach and education. These recommendations aim to make Louisiana's streets even safer and more accessible for everyone.

The study's findings are not just limited to Louisiana; they offer valuable lessons for other places grappling with similar challenges. By reassessing and refining how we design and use our streets, we move closer to a future where transportation is safe and accessible for everyone, regardless of how they choose to move around.

Dr. Bian also explained, "Though this study was conducted for Louisiana specifically, the evaluation procedure, data sources, methodologies, and recommendations are expected to be applicable to other states and government agencies facing challenges in implementing Complete Streets policy."

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To learn more about this project, please visit www.ltrc.lsu.edu/pubs_final_reports.html and select Final Report 679 or contact Dr. Ruijie Bian at 225-767-9163 or Ruijie.Bian@la.gov.





TRAINING

LTRC is pleased to announce the 2025 Louisiana Transportation Conference (LTC) is scheduled for March 16-19, 2025, at the Raising Cane's River Center in downtown Baton Rouge.

The LTC is held to foster a better relationship and understanding among professionals from all sectors of the transportation community. We look forward to offering you innovative programming, impactful networking, and opportunities for education on the emerging topics of our transportation community.

The conference website, www.ltrc.lsu.edu/ltc_25, will be updated with information as the conference approaches. Attendee registration will open in August 2024.

Call for Presentation Topics

Do you have an idea for a conference presentation topic? Send your ideas to the program committee or contact Garrett Wheat at Garrett.Wheat@la.gov.

STAFF NEWS

Updates and Accomplishments

Congratulations to HMA & Specialized Training Program Manager **Hannah Boggs** on completing her HMA Paving Specialty Area exam with a perfect score.

PUBLICATIONS

Recently Published

Final Report and Technical Summary 691 (20-2C)

Using the Portable XRF to Identify/Verify Field Material Properties Zhen Liu, Ph.D., P.E.; Jose Milla, Ph.D., P.E.; and William Saunders, E.I.

Final Report and Technical Summary 692 (20-1ST)

Developing Load Distribution Formula for Louisiana Cast-in-place Reinforced Concrete Box Culverts
Ayman M. Okeil, Ph.D., P.E. (FL), and Navid Jafari, Ph.D.



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