



# ANNUAL REPORT 2019–2020



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**SHAWN D. WILSON, PH.D.**  
**SECRETARY**



**THOMAS C. GALLIGAN, JR.**  
**LSU INTERIM PRESIDENT**

The Louisiana Transportation Research Center (LTRC) is a research, technology transfer, and training center administered jointly by the Louisiana Department of Transportation and Development (DOTD) and Louisiana State University (LSU). LTRC provides a setting in which the thresholds of technology can be explored and applied in practical ways. By merging the resources of DOTD and LSU, a versatile core of facilities and expertise addresses the rapidly evolving challenges in the transportation field.

In addition to its affiliation with LSU, LTRC participates fully with other universities in Louisiana that house engineering programs: Louisiana Tech University, McNeese State University, Southern University, Tulane University, University of Louisiana at Lafayette, and University of New Orleans. By combining their resources with those of DOTD, the center eliminates duplication of effort and provides a broader base of support. The center also provides an avenue for multi-disciplinary support from universities to meet the practical and academic needs of the transportation industry in such areas as engineering, law, business and management, basic sciences, planning, environmental studies, safety, ITS, and technology transfer.

Since its creation by the Louisiana legislature in 1986, LTRC has gained national recognition through its efforts to improve transportation systems in Louisiana. The center conducts short- and long-term research while providing technical assistance, training, continuing education, technology transfer, and problem-solving services to DOTD and the transportation community at large. The center is largely supported through funding authorized by DOTD and the Federal Highway Administration (FHWA).

The LTRC Foundation, a non-profit organization, enhances the center as the focus for transportation-related research, technology transfer, and education in Louisiana. The foundation provides an excellent partnership opportunity for DOTD, state universities, and the private sector.

In these and other ways, LTRC is paving the way for more efficient and beneficial research and training, thanks to a combination of modern techniques, locally available resources, and a wide pool of support.

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*This publication is a report of the transportation research, technology transfer, education, and training activities of the Louisiana Transportation Research Center for July 1, 2019–June 30, 2020. The center is sponsored jointly by the Louisiana Department of Transportation and Development and Louisiana State University.*



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# FACILITIES

Located on the LSU campus in Baton Rouge, LTRC provides researchers and students access to excellent laboratories and state-of-the-art research equipment. The full resources of LSU as a Carnegie Designated Doctoral/Research Extensive Institution are also available. The unique position of LTRC provides access to virtually all of DOTD and LSU's resources to pursue the center's mission.

LTRC houses more than 90 employees and up to 30 students in two adjacent facilities. The LTRC Administration building is a 25,300-square foot facility that includes five research laboratories, a conference room, and offices. The laboratories are used to conduct advanced research into asphalt, concrete, soils, pavements, and ITS topics. The 14,000-square foot Transportation Training and Education Center (TTEC) houses a lecture hall, computer-based training classroom, two general classrooms, and conference room that are all equipped with advanced education and training equipment and distance learning/video-conferencing capabilities. A comprehensive transportation library office is also included.

TTEC greatly enhances LTRC's mission by facilitating the delivery of training, professional development opportunities, and technology transfer to engineers, technicians, undergraduate and graduate students, and professionals from both the public and private domains.

LTRC has identified research areas of strategic importance and has developed expanded capabilities for concentration in several areas: the Engineering Materials Characterization Research Facility (EMCRF), a laboratory facility specializing in fundamental materials characterization; the Geotechnical Engineering Research Laboratory (GERL), a laboratory focusing on transportation earthworks, structural foundations, and geosynthetics; and the Intelligent Transportation Systems (ITS) lab, the newest lab designed to evaluate traffic data collected from Louisiana's traffic management centers. Although remote from the center, the Louisiana Pavement Research Facility is an important facility that streamlines pavement loading research by compressing years of road wear into months of testing. The six-acre facility is located on the west side of the Mississippi River and incorporates an Accelerated Loading Facility (ALF™) for testing flexible pavements and the ATLaS30 for testing rigid pavements.

LTRC is a budget division of the Louisiana Department of Transportation and Development. Funding is a combination of State Planning and Research (Part B, Federal), Innovative Bridge Research and Deployment (Federal), Surface Transportation Program (STP-Federal), and external contracts and grants, such as the National Cooperative Highway Research Program, Federal Agency Grants, and the National Science Foundation.



**LTRC MAIN BUILDING & LAB FACILITIES**



**TRANSPORTATION TRAINING AND EDUCATION CENTER (TTEC)**



**PAVEMENT RESEARCH FACILITY**



## Message from THE DIRECTOR

This reporting period of 2019-20 has presented trying times for LTRC as well as our state, our country, and our world. We have dealt with structural issues at our physical facilities, a global pandemic, and the heartbreaking death of one of our employees. But LTRC continues to persevere.

Inside this report, you will find featured articles on the research program, technology transfer and training, and technology transfer activities. In addition, you will find completed and active research projects, training accomplishments, and support of higher education, publications, and presentations.

LTRC is committed to the support of higher education and solving Louisiana's transportation problems. Within this annual report, it is shown that LTRC has completed 32 research projects and has 46 active on-going research projects. Louisiana continues to be the lead pooled fund state for the Southeast Transportation Consortium study and has submitted the final report for the "Design and Analysis Procedures for Asphalt Mixtures Containing High-RAP Contents and/or RAS" pooled-fund study. These pooled-fund studies are a collaborative effort between the Federal Highway Administration (FHWA) and state departments of transportation. In addition, LTRC supported 63 undergraduate and graduate students through research projects during fiscal year 2019-2020. LTRC research projects were associated with 18 dissertations or theses this reporting period.

In March of this fiscal year, Louisiana hosted the 2020 Louisiana Transportation Conference in which 1,800 people from across the nation were in attendance. The theme of the conference was "Transportation Innovation: The Foundation of our Future." Key speakers at the general session included the Honorable John Bel Edwards, Governor of the State of Louisiana, and David Woessner, Executive Vice President of Corporate Development & Regulatory Affairs for LM Industries. Welcome addresses were given by Dr. Shawn Wilson, DOTD Secretary, and Jim Tymon, AASHTO Executive Director. Additional highlights shown in the 2019-2020 LTRC annual report are as follows:

- As part of the Every Day Counts (EDC) initiative, LTRC conducted research on "Monitoring of In-Service Geosynthetic Reinforced Soil (GRS) Bridge Abutments in Louisiana."
- Workforce Development completed 21 projects and has 16 on-going projects.
- External Training Program impacted almost 4500 individuals (departmental, state, local, and transportation community partners) through over 300 programmatic initiatives.
- The Louisiana Local Technical Assistance Program (LTAP) impacted over 1100 individuals through various in-person and virtual training platforms this program year. LTAP completed 5 projects and has 14 on-going projects.

In the area of Technology Transfer, LTRC published 19 final reports and technical summaries, 13 project capsules, 4 technical assistance reports, and 4 *Technology Today* newsletters. In addition, LTRC filmed and produced 21 DOTD informational videos, 3 Transportation Talk videos featuring the DOTD Secretary, a DOTD nuclear calibration instructional video, and 50 math/instructional videos.

Please follow LTRC's latest news via our website, [www.ltrc.lsu.edu](http://www.ltrc.lsu.edu), and through social media.



Respectfully submitted,  
Samuel B. Cooper, Jr., Ph.D., P.E., Director

# COMPLETED RESEARCH

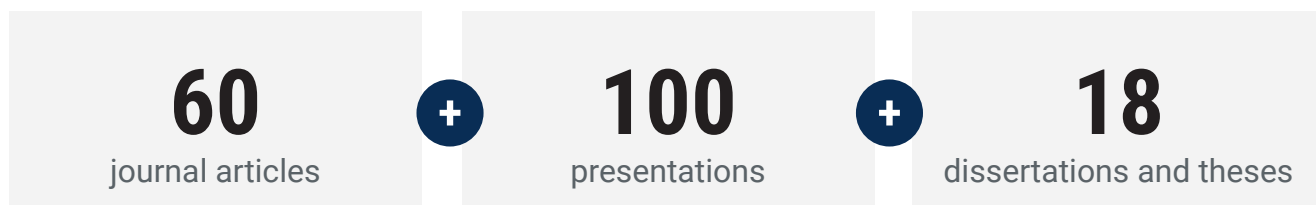
*The LTRC research program emphasizes applied research and technology transfer to further knowledge in the field of transportation and to solve transportation problems encountered by DOTD and the general transportation community. Input for research programs is solicited from state and local government, universities, and private industry.*



| LTRC PROJECT NO.            | PROJECT TITLE  | PRINCIPAL INVESTIGATOR | AFFILIATION            |
|-----------------------------|--|------------------------|------------------------|
| <b>BITUMINOUS (ASPHALT)</b> |  |                        |                        |
| 15-1B                       | Evaluation of Crumb Rubber Modification of Louisiana Mixtures  | Saman Salari           | LTRC                   |
| 17-1B                       | Field Implementation of Handheld FTIR Spectrometer for Polymer Content Determination and for Quality Control of RAP Mixtures | Nazimuddin Wasiuddin   | LTU                    |
| <b>CONCRETE</b>             |  |                        |                        |
| 14-4C                       | Evaluation of Bonded Concrete Overlays over Asphalt under Accelerated Loading  | Zhong Wu               | LTRC                   |
| 14-5C                       | DOTD Support for UTC Project: Development of Rapid PCC Pavement Repair Materials and Construction Techniques                 | Hak-Shul Shin          | Southern University    |
| 18-6C                       | Influence of Internal Curing on Measured Resistivity   | Jose Milla             | LTRC                   |
| <b>GEOTECHNICAL</b>         |  |                        |                        |
| 13-5GT                      | Monitoring of In-Service Geosynthetic Reinforced Soil Bridge Abutments in Louisiana  | Murad Abu-Far-sakh     | LTRC                   |
| 13-9GT                      | CORS 911: Continuously Operating Reference Stations for the Bayou Corne Sinkhole   | J. Anthony Cavell      | LSU                    |
| 15-1GT                      | pLog Enterprise - Enterprise GIS-Based Geotechnical Data Management System Enhancements                                      | Scott Deaton           | Dataforensics          |
| 16-1GT                      | DOTD Geotechnical Design Manual  | Ed Tavera              | GeoStellar Engineering |
| 18-1GT                      | Analysis of Driven Pile Capacity within Pre-bored Soil   | Shengli Chen           | LSU                    |

| LTRC PROJECT NO.   | PROJECT TITLE   | PRINCIPAL INVESTIGATOR | AFFILIATION                                |
|--------------------|---|------------------------|--|
| <b>PAVEMENT</b>    |   |                        |  |
| 12-2P              | Assessment of Environmental, Seasonal, and Regional Variations in Pavement Base and Subgrade Properties   | Kevin Gaspard          | LTRC                                       |
| 12-11P             | Field Validation of Equivalent Modulus for Stabilized Subgrade Layer  | Mark Martinez          | LTRC                                       |
| 14-2P              | Assessment of Structural Capacity Indicators from Rolling Wheel Deflectometer Data Collection in Louisiana  | Mostafa Elseifi        | LSU  |
| 16-2P              | Transportation Infrastructure Asset Damage Cost Recovery Correlated with Shale Gas/Oil Recovery Operations in Louisiana                           | Zhong Wu               | LTRC                                       |
| 16-5P              | Pavement Service Life Extension Due to Asphalt Surface Treatment Interlayer   | Mohammad Khattak       | ULL  |
| 17-1P              | Improving the Use of Crack Sealing to Asphalt Pavement in Louisiana   | Mostafa Elseifi        | LSU  |
| 18-3P              | Best Practices for Assessing Roadway Damages Caused by Flooding   | Minjiang Tao           | WPI  |
| <b>POOLED FUND</b> |   |                        |  |
| 16-1PF             | Development of a Guidebook for Determining the Value of Research Results  | Yoojung Yoon           | West Virginia University                   |
| 19-1PF             | Synthesis on Documenting and Tracking Research Implementation   | Husam Sadek            | LSU  |
| 19-2PF             | Synthesis on the Contributing Factors and Effective Countermeasures for Low-Volume Roadway Fatality Rates in the Southeast                        | Nikiforos Stamatiadis  | University of Kentucky Research Foundation |
| 19-3PF             | Synthesis on the Best Practices for State DOTs to Determine Project Delivery Time, Project Management, and Ratio of Consultant to In-House Design | Amirhosein Jafari      | LSU  |

During fiscal year 2019-20, 63 students (undergraduate and graduate) were supported by LTRC research projects. LTRC staff and contract researchers published 60 journal articles and completed over 100 presentations at national and international conferences. LTRC research projects were associated with 18 dissertations or theses.



# COMPLETED RESEARCH *continued*

| LTRC PROJECT NO.       | PROJECT TITLE   | PRINCIPAL INVESTIGATOR | AFFILIATION                      |
|------------------------|---|------------------------|----------------------------------|
| <b>SAFETY</b>          |   |                        |                                  |
| 17-1SA                 | Evaluating the Effectiveness of Regulatory and Warning Signs on Driver Behavior near Highway/Rail Crossings         | Julius Codjoe          | LTRC                             |
| 18-4SA                 | Intersection on Horizontal Curves: Problems and Potential Solutions   | Xiaoduan Sun           | ULL                              |
| 19-1SA                 | Evaluation of Counting Device for Pedestrians and Bicyclists  | Yasser Isamail         | Southern University              |
| <b>STRUCTURES</b>      |   |                        |                                  |
| 14-1ST                 | Evaluating Louisiana New Continuity Detail for Girder Bridges   | Yoojung Yoon           | West Virginia University         |
| 16-4ST                 | Overheight Impact Avoidance and Incident Detection System   | George Voyiadjis       | LSU                              |
| 18-5ST                 | Investigating Available State-of-the-Art Technology for Determining Needed Information for Bridge Rating Strategies | Afshin Karshenas       | FDH Infrastructure Services, LLC |
| <b>SPECIAL STUDIES</b> |   |                        |                                  |
| 14-3SS                 | Development of a Mode Choice Model to Estimate Evacuation Transit Demand  | Chester Wilmot         | LTRC/LSU                         |
| 15-2SS                 | Cost and Time Benefits for using Subsurface Utility Engineering in Louisiana  | Kirk Zeringue          | LTRC                             |
| 17-1SS                 | Economic Evaluation of Applicants to the Port Construction and Development Priority Program                         | James Richardson       | LSU                              |
| 17-3SS                 | Hurricane Evacuation Modeling Package   | Chester Wilmot         | LTRC/LSU                         |
| 18-6SS                 | An Assessment of DOTD'S Consultant Plan Development and Performance Rating Process                                  | Ron Hamilton           | Dye Management Group             |
| 19-4SS                 | The Impact of the Louisiana Rail Infrastructure: A System Analysis and Plan   | Bethany Stich          | UNO                              |



# ACTIVE RESEARCH

| LTRC PROJECT NO.            | PROJECT TITLE  | PRINCIPAL INVESTIGATOR | AFFILIATION |
|-----------------------------|--|------------------------|-------------|
| <b>BITUMINOUS (ASPHALT)</b> |  |                        |             |
| 17-4B                       | Development of a 4.75-mm Asphalt Mixture Design  | Saman Salari           | LTRC        |
| 18-5B                       | Evaluation of Asphalt Rubber and Reclaimed Tire Rubber in Chip Seal Applications   | Mostafa Elseifi        | LSU         |
| 20-4B                       | Low and Intermediate Temperature Evaluation of Binders through Dynamic Shear Rheometer–Support Study                                 | Nazimuddin Wasiuddin   | LTU         |
| 20-3B                       | Low and Intermediate Temperature Evaluation of Binders through Dynamic Shear Rheometer   | Saman Salari           | LTRC        |
| 20-2B                       | Feasibility and Performance of Low Volume Roadway Mixture Design   | Corey Mayeux           | LTRC        |
| 20-1B                       | Evaluate Performance and Life Cycle Cost of Asphalt (8/18 Specifications)  | Corey Mayeux           | LTRC        |
| <b>CONCRETE</b>             |  |                        |             |
| 17-1C                       | Effect of Clay Content on Alkali-Carbonate Reactive (ACR) Dolomitic Limestone  | Jose Milla             | LTRC        |
| 20-3C                       | Feasibility and Advantages of Accepting Concrete Other Than 28 Days  | William Saunders       | LTRC        |
| 20-2C                       | Using the Portable XRF to Identify/Verify Field Material Properties  | Jose Milla             | LTRC        |
| 20-1C                       | Evaluation of the Miniature Concrete Prism Test (MCPT) for use in LADOTD   | Jose Milla             | LTRC        |
| <b>POOLED FUND</b>          |  |                        |             |
| 14-5PF                      | Design and Analysis Procedures for Asphalt Mixtures Containing High-RAP Contents and/or RAS  | Louay Mohammad         | LTRC        |
| <b>GEOTECHNICAL</b>         |  |                        |             |
| 13-3GT                      | Finite Element Analysis of the Lateral Load Test on Battered Pile Group at I-10 Twin Span Bridge                                     | Murad Abu-Farsakh      | LTRC        |
| 16-6GT                      | Incorporating the Site Variability and Laboratory/ In-situ Testing Variability of Soil Properties in Geotechnical Engineering Design | Murad Abu-Farsakh      | LTRC        |

| LTRC PROJECT NO.                | PROJECT TITLE  | PRINCIPAL INVESTIGATOR | AFFILIATION                        |
|---------------------------------|--|------------------------|------------------------------------|
| <b>GEOTECHNICAL (CONTINUED)</b> |  |                        |                                    |
| 17-2GT                          | Update the Pile Design by CPT Software to Incorporate Newly Developed Pile-CPT Methods and Other Design Features         | Murad Abu-Farsakh      | LTRC                               |
| 18-4GT                          | Geotechnical Asset Management for Louisiana through Dynamic Shear Rheometer  | Gavin Gautreau         | LTRC                               |
| 19-2GT                          | Quality Control/Assurance on Base Course and Embankment with the Dynamic Cone Penetrometer                               | Nick Ferguson          | LTRC                               |
| 19-1GT                          | Maintenance of Roadway Edge Drop-Off Utilizing Readily Available Materials   | Gavin Gautreau         | LTRC                               |
| 20-3GT                          | Development of a Design Methodology for Geosynthetic Reinforced Pavement using Finite Element Numerical Modeling         | Murad Abu-Farsakh      | LTRC                               |
| 20-2GT                          | Instrumentation and Modeling of Geosynthetic Load Transfer Platform Performance  | Murad Abu-Farsakh      | LTRC                               |
| 20-1GT                          | Literature Search on Use of Flexible Pipes in Highway Engineering for DOTD's Needs                                       | Navid Jafari           | LSU                                |
| <b>PAVEMENT</b>                 |  |                        |                                    |
| 16-6P                           | Quality Management of Cracking Distress Survey in Flexible Pavements Using LTRC Digital Highway Data Vehicle             | Zhong Wu               | LTRC                               |
| 18-1P                           | Exploration of Drone and Remote Sensing Technologies in Highway Embankment Monitoring and Management                     | Zhongjie Zhang         | LTRC                               |
| 18-2P                           | Mitigating Joint Reflective Cracks using Stone Interlayers: Case Study on Louisiana Highway 5, Desoto Parish             | Kevin Gaspard          | LTRC                               |
| 18-4P                           | Cost-Effective Detection and Repair of Moisture Damage in Pavements  | Mostafa Elseifi        | LSU                                |
| 19-1P                           | Application of Mechanistic-Empirical Pavement Design Approach into RCC Pavement Thickness Design                         | Zhong Wu               | LTRC                               |
| 19-2P                           | Mechanistic Characterization of Asphalt Overlays for Pavement Rehabilitation and Preservation using Pavement ME Approach | Zhong Wu               | LTRC                               |
| 20-4P                           | Assessment of DOTD's Friction Aggregate Sources through Laboratory and Accelerated Testing                               | Zhong Wu               | LTRC                               |
| <b>SAFETY</b>                   |  |                        |                                    |
| 18-2SA                          | Louisiana's Alcohol-Impaired Driving Problem: An Analysis of Crash and Cultural Factors                                  | Eva Shipp              | Texas A&M Transportation Institute |
| 18-5SA                          | Evaluating Pedestrian Crossings on High Speed Urban Arterials  | Julius Codjoe          | LTRC                               |

| <b>LTRC PROJECT NO.</b> | <b>PROJECT TITLE</b>   | <b>PRINCIPAL INVESTIGATOR</b> | <b>AFFILIATION</b>                     |
|-------------------------|--|-------------------------------|--|
| 19-5SA                  | Young Driver Crashes in Louisiana: Understanding the Contributing Factors to Decrease the Numbers                              | Elisabeta Mitran              | ULL/LTRC                               |
| 19-4SA                  | Impact of Center Line Rumble Strips And Shoulder Rumble Strips On All Roadway Departure Crashes in Louisiana Two-Lane Highways | Xiaoduan Sun                  | ULL                                    |
| <b>SPECIAL STUDIES</b>  |  |                               |  |
| 10-6SS                  | Establishing an Intelligent Transportation Systems (ITS) Lab at LTRC (Phase II)  | Julius Codjoe                 | ULL/LTRC                               |
| 18-3SS                  | Evaluation of DOTD's Existing Queue Estimation Procedures  | Julius Codjoe                 | ULL/LTRC                               |
| 18-4SS                  | Trip Generation Modification Factors for Louisiana   | Chester Wilmot                | LSU/LTRC                               |
| 19-2SS                  | Determining Louisiana's Roundabout Capacity  | Julius Codjoe                 | ULL/LTRC                               |
| 19-5SS                  | Assessing the Economic Benefits of the TIMED Program   | Chester Wilmot                | LSU/LTRC                               |
| 19-3SS                  | Exploring Non-Traditional Methods of Obtaining Vehicle Volumes   | Julius Codjoe                 | ULL/LTRC                               |
| 21-1SS                  | The Impact of the Louisiana Grade Crossings: A Synthesis and System Analysis   | Guang Tian                    | UNO                                    |
| 20-1SS                  | The Future of the Louisiana Waterways Transportation System: A System Analysis and Plan to Move Commerce by Water              | Ricardo Cruz                  | Moffatt & Nichol                       |
| 20-2SS                  | Provision of Transportation Data Analytics to the Louisiana Department of Transportation and Development                       | Michael Pack                  | University of Maryland                 |
| <b>STRUCTURES</b>       |  |                               |  |
| 15-3ST                  | Rehabilitation of Deteriorated Timber Piles using Fiber Reinforced Polymer (FRP) Composites                                    | Hota GangaRao                 | West Virginia University               |
| 16-1ST                  | Retrofit of Existing Statewide Louisiana Safety Walk Bridge Barrier Railing Systems  | William Williams              | Texas A&M (TTI)                        |
| 16-2ST                  | Field Monitoring and Measurements Education: A Model for Civil and Environmental Engineering                                   | Vijaya Gopu                   | LTRC                                   |
| 18-4ST                  | Load Rating of Existing Continuous Stringers on Louisiana's Bridges  | C. Shawn Sun                  | LTU                                    |
| 20-2ST                  | Skew Detection System Replacement on Vertical Lift Bridges (Phase 1)   | Gareth Rees                   | Wiss, Janney, Elstner Associates, Inc. |
| 20-1ST                  | Developing The Load Distribution Formula for Louisiana Culverts  | Ayman Okeil                   | LSU                                    |

# RESEARCH HIGHLIGHT

## MONITORING OF IN-SERVICE GEOSYNTHETIC REINFORCED SOIL (GRS) BRIDGE ABUTMENTS IN LOUISIANA

Geosynthetic reinforced soil (GRS) technology was first used in the United States in the 1970s to build a GRS wall to support logging roads in steep mountain terrain. The GRS has a variety of applications in civil engineering such as walls, bridge piers, and bridge abutments. Over the last few years, the use of GRS for bridge abutments has received considerable attention. Geosynthetic Reinforced Soil Integrated Bridge System (GRS-IBS) is the coined name for a GRS wall and bridge system that was developed as part of the “Bridge of the Future” initiative by FHWA.

The GRS-IBS consists of three components: reinforced soil foundation (RSF), GRS abutment, and integrated approach. The RSF is built from compacted granular aggregate wrapped with geosynthetic, which is placed under the GRS abutment to provide more support and increase the bearing capacity. The GRS abutment is composed of compacted backfill and layers of geosynthetic reinforcement. The integrated approach is also constructed with GRS to transition to the bridge.

In 2010, GRS-IBS was made an Every Day Counts (EDC) initiative. Many bridges in the U.S. have structural deficiencies, with the vast majority single span bridges no more than 90 ft. in length. Currently, the demand for repair and future construction of bridges does not align with government budgets. Therefore, a new efficient system is required so that more bridges can be rehabilitated and constructed at low cost. GRS-IBS is a possible solution for this dilemma.



*The GRS-IBS at Maree Michel Bridge*

The GRS-IBS is a proficient alternative for low-volume, single span bridges. It can be built in less time and over a variety of foundation soil conditions with common equipment and materials. The GRS-IBS is more cost-effective than traditional bridge construction. The cost of a GRS-IBS bridge is 25-30% less than cost of standard pile cap abutments on deep foundations with 2:1 slopes for off-system bridges. The savings is due to the simplicity and flexibility of the design, speed of construction, use of readily available materials/equipment, elimination of deep foundation and other constructions associated with the approach way to the bridge, and lower maintenance costs.

To realize the potential benefits of using GRS-IBS abutments in Louisiana, DOTD built GRS-IBS abutments for the Creek and Maree Michel bridges in Louisiana to examine the performance of GRS-IBS abutments with respect to local materials and



soil conditions. In order to monitor the performance of in-service GRS-IBS abutments, various types of instrumentations were installed in the south abutment of the Maree Michel Bridge. The primary measurements were: vertical and horizontal deformations near the front wall, settlements due to the RSF and the GRS-IBS backfill, distribution of stresses within GRS-IBS abutment and below RSF, and distribution of strains along geosynthetics. Additionally, the pore water pressure and temperature were monitored by piezometers and thermocouples. Six different types of instrumentations were used to monitor the GRS-IBS abutment: Shape Acceleration Array (SAA), horizontal and vertical earth pressure cells, strain gauges, piezometers, and thermocouples. A survey was also conducted at the bridge surface upon the completion of construction. Measurements from instrumentations provide valuable information to evaluate the design procedure and performance of GRS-IBS bridges.

The FHWA design of GRS-IBS abutments was verified based on the collected data from the instrumentation measurements. Furthermore, the long-term monitoring provides the measurements needed to examine the performance, durability, and long-term stability of the GRS-IBS abutments constructed over Louisiana subsurface soil, under the live traffic load condition. In general, the overall performance of the GRS-IBS was within acceptable tolerance in terms of measured strains, stresses, settlements, and deformations.

## Conclusions

- The satisfactory performance of the GRS-IBS abutment at Maree Michel Bridge helps gain more confidence in implementing the GRS-IBS technology.
- The deformation measurements of abutment indicate that the maximum total settlements across the GRS abutment were significantly less than the FHWA recommendations.

- The maximum lateral deformation of the GRS-IBS wall face was less than 1% of the bearing width, as recommended by the FHWA.
- The measured lateral pressure on the wall face was negligible and much less than the Rankine lateral earth pressure.
- The maximum geotextile strains were less than 2% as specified in the FHWA manual.
- The locus of maximum reinforcement strains shows that the failure envelope is most likely a combination of punching shear failure envelope (at top) and Rankine failure envelope (at bottom).
- FE parametric study showed that span length, reinforcement stiffness, and reinforcement spacing are the most significant parameters contributing to the performance of GRS-IBS.

## Recommendations

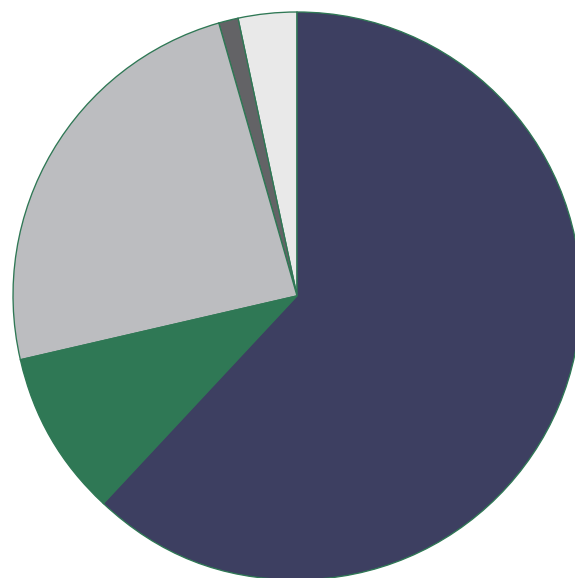
- Based on the satisfactory field performance of the GRS-IBS at Maree Michel Bridge, it is highly recommended that DOTD design engineers start implementing the GRS-IBS technology in the design of new bridge abutments in Louisiana.
- It is recommended to consider verifying the findings of finite element parametric study, such as the effects of length of reinforcement, reinforcement stiffness/spacing, and secondary reinforcement on the performance of GRS-IBS.
- Consider an experimental study to evaluate the combined effects of reinforcement spacing and reinforcement stiffness to optimize the performance of GRS-IBS abutments and to develop and implement the composite concept in the design of GRS-IBS abutments.

# WORKFORCE DEVELOPMENT

*Training is a critical component of career advancement, and DOTD supports and promotes an environment of continual learning. This atmosphere allows employees to maximize their potential and provide qualified personnel crucial to the effective management of the transportation system. Through specialized and intensive job-specific training and education programs, LTRC reaches out to individuals working in the transportation industry. In addition, each year, the External Training Program hosts programmatic initiatives for over 10,000 individuals (state, local, federal, and industry) and is a progressive partnering effort between the public and private sectors of the transportation industry.*

## DOTD STRUCTURED TRAINING UNIT

The DOTD Structured Training Program is a department-sanctioned, progressive training curriculum that requires specific work-related training be completed at each level of an employee’s career path. DOTD supports and promotes an environment of continual learning and believes that training is a necessary and integral part of career advancement. Structured training can involve professional development, technical skills training, continuing education, hands-on, and on-the-job training. The program manages the workforce development for personnel in construction, maintenance, and supervisory/leadership positions. The program also provides liaison assistance to headquarters and district training personnel for policy interpretation and compliance decisions.



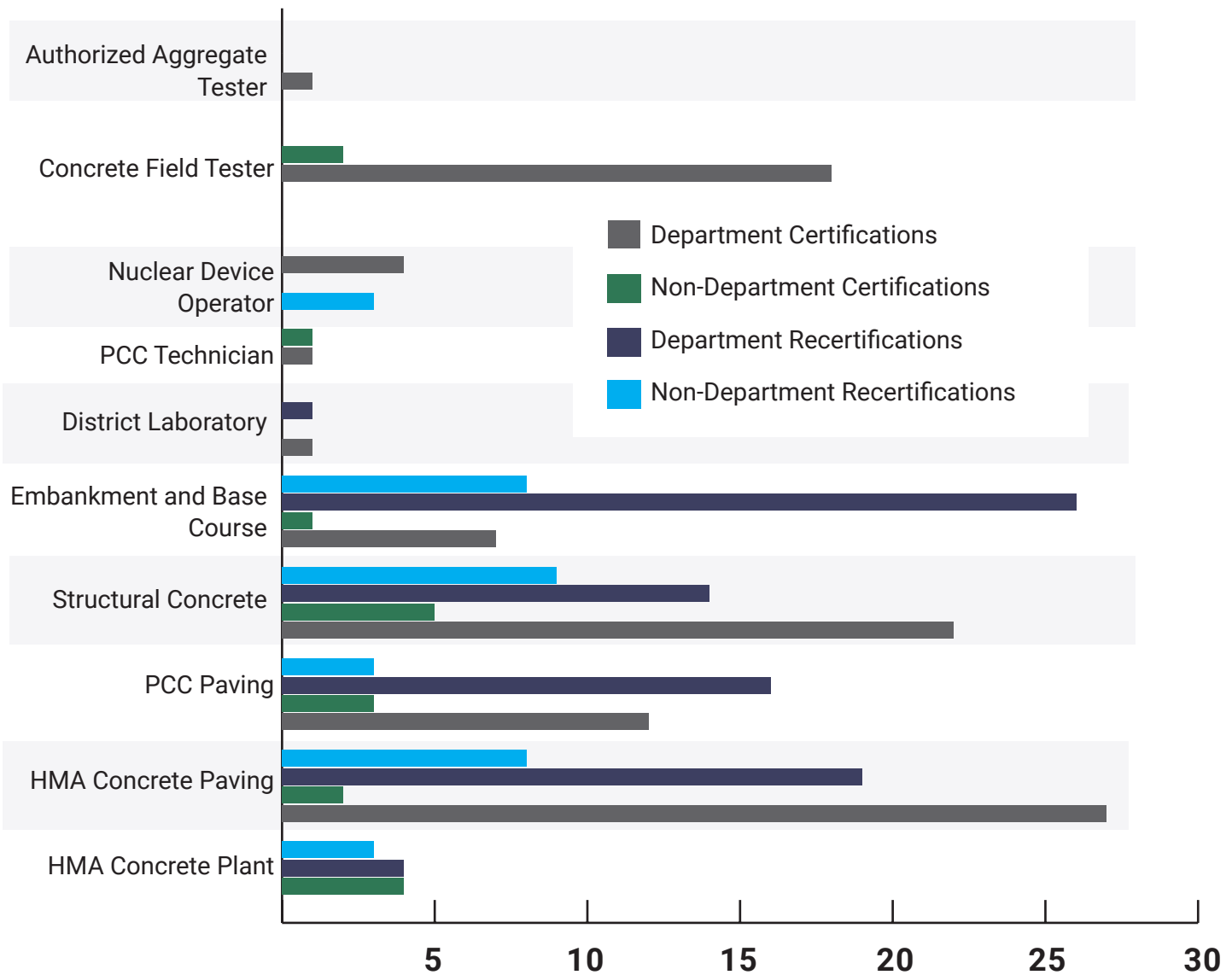
**Structured Training Programs**

- Complete (2,296, 62%)
- At Level (348, 10%)
- More Time (894, 24%)
- Pre-Booked/Booked (44, 1%)
- Past Due (119, 3%)

# CONSTRUCTION AND MATERIALS TRAINING PROGRAM

The Construction and Materials Training Program manages the Inspector/Technician Certification Program for DOTD and the Louisiana transportation industry. This program develops construction and materials training resources and coordinates the training, testing, authorization, certification, and re-certification of inspectors and technicians on a statewide level in each area of construction. During fiscal year 2019-20, LTRC completed the following:

- Processed 111 requests for new certifications (93 department, 18 non-department)
- Processed 114 requests for re-certifications (80 department, 34 non-department)



## **MAINTENANCE TRAINING PROGRAM**

The Maintenance Training Program focuses on the development of new job-specific courses related to job functions, work processes, and safe operation of equipment used by maintenance field personnel. These courses promote an awareness of safe practices and attitudes required for maximum job performance. This training program also assists with the Equipment Operation Certification Program to standardize and improve equipment training for maintenance functions.

## **ENGINEERING TECHNICIAN PROGRAM**

The Engineering Technician Training Program is responsible for the development and delivery of job-related training and evaluation materials for department personnel employed within the engineering technician job series. These courses are designed to maximize employee potential and provide the properly trained personnel crucial to the continued design, construction, and maintenance of the transportation system.

This program also assists section heads and designated section training liaisons in providing their employees the training prescribed by the training programs governing their employees' positions. This program provided the following for the Headquarters sections:

- Orientation—Monthly presentation at new employee orientation. This year provided 376 new employees information about respective training programs and how to fulfill individual training requirements.
- Exception reports—If an employee's training is incomplete at the time of a proposed personnel action, such as a merit increase or promotion, an exception may be allowed if it is the result of circumstances over which the employee has no control, such as scheduling or unavailability. Training records of 13 employees were reviewed and exceptions granted this fiscal year.
- Testing—Testing sessions are held three times a month for self-study courses. Employees were given 137 tests for different courses this fiscal year.

## **TRANSPORTATION CURRICULUM COUNCIL**

The DOTD Structured Training Director serves as liaison to the LTRC Transportation Curriculum Council (TCC) as outlined in PPM 47 and act as a liaison between LTRC and the HQ sections to provide assistance with conformance to structured training requirements.

The TCC held its first meeting on September 1, 2010. It has an active council consisting of 13 members from Louisiana State University, transportation partners and DOTD management. There are six subcommittees: Engineering, Operations, Multimodal, Management and Finance, Core Skills, and Leadership and Outreach. The purpose of the committee and related subcommittees is to advise and assist LTRC in the identification, prioritization, development, evaluation, and implementation of transportation-related technology transfer, training, work development, and educational services for DOTD and its public and private transportation industry partners. The TCC held three meetings this fiscal year.



# MANAGEMENT DEVELOPMENT TRAINING PROGRAM

This program oversees several mandatory supervisory, management development, and career development training programs: Management Development Training program, a structured training program for DOTD employees in a professional job series; the Civil Service Supervisory training program for supervisors; and the Engineering Technician Supervisory Training program, which is required, in addition to structured training, for engineering technician employees who move into a supervisory-level position.

During fiscal year 2019-20, courses for these training programs were delivered through several sources: The Civil Service Comprehensive Public Training Program (CPTP); the DOTD Human Resources Section; and in-house training courses developed by LTRC.

There were 989 employees subscribed to the Management Development Program and there were 480 employees subscribed to the Management Development Technician Program; 155 completed their course programs in fiscal year 2019-20.

DOTD supervisory employees are also required to participate in the CPTP Supervisory Programs and take continuing education each year after the supervisory programs are completed.

Number of employees who completed continuing education in FY 2019-20: 545

## FY 2019-20 CPTP SUPERVISORY GROUP PROGRAM PARTICIPANTS

CPTP Supervisory Group 1: 574  
CPTP Supervisory Group 2: 241  
CPTP Supervisory Group 3: 66

## FY 2019-20 EMPLOYEES WHO COMPLETED SUPERVISORY GROUP PROGRAMS

CPTP PES Supervisory Group: 73  
CPTP Core Supervisory Group: 40  
CPTP Supervisory Group 1: 50  
CPTP Supervisory Group 2: 19  
CPTP Supervisory Group 3: 3



## PRESENTATIONS/CLASSES

- 3 Basic Flagging Procedures classes
- 5 Project Management classes
- 1 Hot Mix Asphalt Mix Design class
- 1 Testing and Analysis 1 & 2 Class
- 1 Structural Concrete Inspection class
- 2 PCC Paving classes
- 3 Facilitation Skills classes

## COMPLETED PROJECTS

### Construction

- *PCC Paving Inspection Manual*
- *PCC Mix Design Manual*
- *Aggregate Tester Authorization*
- *HMA Authorization – New Authorized HMA Plant Technician*
- *HMA Plant Certification*
- *Asphalt Paving 1*
- *Asphalt Paving 2*

### Maintenance

- JLG 600S Boom Lift Equipment Operator Certification
- *Maintenance of Small Traffic Signs*
- *Single-Phase Motors Manual* revision
- Development of Spray Injection Patcher Equipment Certification

### Other Projects

- LTRC Course Catalog
- *Stage 4 Project Delivery* WBT course
- *Stage 5 Project Delivery* WBT course
- *Compliance for Construction* WBT course
- *Compliance for LPA Reporting* WBT course
- *Project Management* ILT course revision
- *Grammar 3* to web-based format
- Update of PPM #59, Workforce Development
- *Mathematics for Construction Personnel 2* WBT course

## ON-GOING AND CURRENT PROJECTS

### Construction

- *Structural Concrete Inspection Volumes I and II* manual revision
- *PCC Plant Inspection Manual Sub-structural Inspection: Drill Shafts* manual
- Lab procedure instructional training videos
- *Pre-Stressed Concrete Inspection* course revision
- *Structural Steel Welding Inspection* course creation
- Management of the Inspector/Technician Certification Program for DOTD and LA transportation industry

### Maintenance

- Equipment Operator Certification Program
- *Traffic Control Through Maintenance Work Areas* Handbook Update
- *Traffic Control Through Maintenance Work Areas* ILT course revision
- *Maintenance Traffic Control* Handbook revision

### Other Projects

- Course development of *Road Safety 101, LPA CE&I, Additional Stages of Project Delivery, Mathematics for Construction Personnel 1* WBT
- Update of various manuals
- *Site Manager for LPA* training
- LTRC's Test.com E-Testing System management
- LEO and DTRN support and training

# EXTERNAL TRAINING PROGRAM ACTIVITIES OVERVIEW

In fiscal year 2019-20, the DOTD External Programs impacted over 4,500 individuals (departmental, state, local, and transportation community partners) through over 300 programmatic initiatives and the Louisiana Transportation Conference (see page 21).

| EVENT/CLASS/WORKSHOP               | NUMBER OF EVENTS | NUMBER OF PARTICIPANTS |
|------------------------------------|------------------|------------------------|
| Other NHI, Contract Classes        | 14               | 167                    |
| Leadership Development Institute   | 13               | 134                    |
| LSU CADD                           | 5                | 50                     |
| UNO PC                             | 49               | 383                    |
| Nuclear Gauge and Radiation Safety | 1                | 19                     |
| ArcGIS                             | 8                | 103                    |
| Workshops and Conferences          | 15               | 710                    |
| ATTSA                              | 2                | 64                     |
| Mechanics Courses                  | 3                | 41                     |
| Individual Registrations           | —                | 367                    |

## PUBLICATIONS HIGHLIGHTS



- Published 4 *Technology Today* newsletters, 13 project capsules, 19 final reports/technical summaries, 4 tech assistance reports
- Edited 12 final reports/technical summaries
- Implemented new Word template
- 2020 LTC publications, web, and trade show support
- Launched redesign of LTRC website for improved accessibility and mobile-friendly navigation
- Support for all Section 33 users managing the Registration Management System
- Produced templates for Section 33 training materials
- Provided web support for NSF project: Field Monitoring and Measurements Education
- Updated all current forms/documents on LTRC and LTAP site for 508 compliance (research forms, resources, etc.)
- Photographed all LTRC events including LTC 2020
- Filmed and produced 21 DOTD informational videos
- Filmed and produced 1 DOTD nuclear calibration instructional video
- Filmed and produced 3 Transportation Talk videos featuring Secretary Wilson
- Filmed and produced 50 math/instructional videos
- 630 subscribers on YouTube

*The following are brief overviews of External Training Program activities managed at LTRC.*

### **National Highway Institute (NHI)**

The NHI Program covers the 14 programmatic areas that are offered statewide to DOTD employees, municipal employees, private engineering firms, and other transportation partners. These areas include, but are not limited to, the following:

- Asset Management
- Business, Public Administration and Quality
- Construction and Maintenance
- Design and Traffic Operations
- Environment
- Freight and Transportation Logistics
- Geotechnical
- Highway Safety
- Hydraulics
- Intelligent Transportation Systems (ITS)
- Pavement and Materials
- Real Estate
- Structures
- Transportation Planning

This program has various courses that are required in departmental structured training pro-

grams. These courses address Louisiana-specific material and federal guidelines as well. ***During fiscal year 2019-20, 213 participants attended 8 courses.***

### **CADD/MicroStation Structured Training**

This program has developed DOTD's current process for obtaining surveying information that utilizes Microstation, Inroads, and Inroads Survey. This process of coding and capturing data continues to evolve as departmental and federal regulations change. Microstation and Inroads are the software backbones for the Department's plan development.

It is imperative that the Department identifies where trends are going and how newer software reacts to the current data collection processes. The Department is required to train and test new versions of the software to not only give guidance to DOTD staff but the consultants who work for the Department as well. ***During fiscal year 2019-20, 50 participants attended 5 courses.***

### **Work Zone Safety**

Through this program, the following Louisiana-specific courses are required for departmental employees and any other non-departmental entity that will work on a departmental project: *Louisiana Traffic Control Technician; Louisiana Traffic Control Supervisor; Louisiana Traffic Control Design Specialist; Louisiana Guardrail Installation Training; and Louisiana Nighttime Traffic Control.*

These workshops inform individuals about safety procedures and improve worker knowledge in order to avoid injury during their daily employ-





ment activities. Through these efforts, this also enables highway workers to provide for the safety of motorists, workers, and pedestrians. ***During fiscal year 2019-20, 64 participants attended 2 ATTSA courses.***

## Nuclear Gauge and Radiation

This program assists departmental employees who are authorized to use a nuclear gauge for density testing on Louisiana's highway construction projects. It is one of the most important quality assurance tools an inspector has to ensure that the foundation of the road will perform as designed. The use of any device containing nuclear material requires compliance with the federal Nuclear Regulatory Commission regulations and safety precautions, enforced by the Louisiana Department of Environmental Quality and DOTD. To ensure that overexposure to radiation does not occur, DOTD monitors over 450 nuclear gauge operators with a dosimeter badge. DOTD is also concerned with the public's exposure to radiation from Department-owned nuclear gauges. ***During fiscal year 2019-20, 19 participants attended 1 Nuclear Gauge and Radiation Safety course.***

## DOTD ArcGIS Program

The DOTD ArcGIS Program is guided by Map 21 and is federal regulations based. These regulations and Map 21 are moving state transportation agencies into a GIS-based environment for asset management, performance management, inventory, and operations. Transportation-related GIS technologies rely on a linear referencing method to associate legacy data systems with GIS technologies. DOTD has GIS uses in almost all of its engineering and business sections. ***During fiscal year 2019-20, 103 participants attended 8 courses.***



## PC/Microsoft Structured Training

This program is strategically mapped to various employee structured training programs. These courses are required for departmental engineers, engineering technicians, administrative staff, and support personnel. The course requirements vary by employee category. ***During fiscal year 2019-20, 383 participants attended 49 courses.***

## Co-Op Program

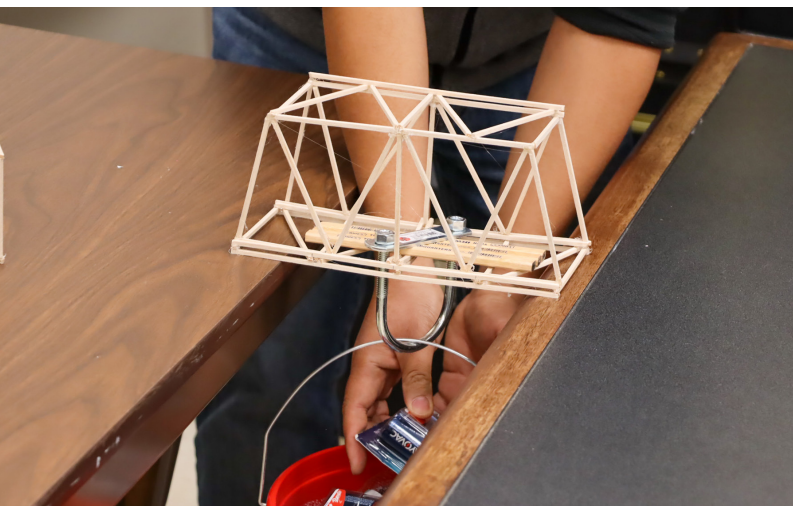
The DOTD Co-op Program is a cooperative endeavor between DOTD and seven Louisiana universities with engineering departments. It provides practical experience to civil, mechanical, environmental, electrical, industrial, and chemical engineering students through employment in public sector transportation engineering work. The program is intended to enhance the educational process by providing opportunities for participants to explore their interest in transportation engineering through practical experience. The program also provides opportunities for DOTD to evaluate participants as potential employees.

To participate in the program, the students must have the endorsement of their university and be classified as a junior or senior. The students are employed year round in positions related to their major engineering field of study and must give a presentation at the end of the semester. ***During fiscal year***

*2019-20, 6 students participated in the summer, 15 in the fall, and 16 in the spring.*

### Engineering Rotational Development

This program provides new engineers with an invaluable introduction to DOTD employment. The ERDP is a 32-week rotation program designed to offer entry-level engineers an opportunity to experience several engineering functional areas within DOTD prior to placement. After orientation at LTRC, participants spend 1 to 3 weeks in 19 different sections. To be employed into the ERDP, the applicant has to have successfully passed the Fundamentals of Engineering (FE) exam and hold an active FE certification. *During fiscal year 2019-20, 7 new hires participated in the ERDP, with 4 hired into permanent positions in the Department and 2 still in the rotation.*



### Leadership Development

This program provides participants a process of continuous learning and the ability to apply the leadership methods discussed. In addition, the Leadership Development Program aims for everyone within DOTD to adopt new behaviors and beliefs toward effective leadership and extend them to the highest levels of achievement.

The goal of this program is to introduce and promote competencies that will empower participants to recognize and improve their leadership skills.

*During fiscal year 2019-20, 134 people participated in 13 courses.*

### Other Courses and Workshops

A total of 751 students participated in the following courses:

- *Traffic Engineering Process & Report Workshop*
- *Highway Capacity Analysis Data Defaults Calibrations*
- *Highway Capacity Analysis Hands-On Software Application*
- *FHWA Traffic Analysis Workshop*
- *NPMRDS (probe Data) Analytics Workshop*
- *Statewide Traffic Engineers Meeting*
- *Professionalism and Ethics*
- *TRAC and RIDES (Fall)*
- *RIDES (Summer)*
- *PE Review*
- *Building Safety with LSU PD*
- *LTRC Seminar Series: Geotechnical Topics*
- *Lunch and Learns*
- *Mechanics Class*

# 2020 LOUISIANA TRANSPORTATION CONFERENCE

Over 1,800 transportation professionals, industry partners, and academics from across the nation gathered for the 2020 Louisiana Transportation Conference. This year's theme was *Transportation Innovation: The Foundation of our Future* and took place March 1-4, 2020, at the Raising Cane's River Center.

The conference's general session included key speeches by Governor John Bel Edwards, AASHTO Executive Director Jim Tymon, DOTD Secretary Shawn Wilson, Ph.D., and LTRC Director Sam Cooper, Jr., Ph.D., P.E. This year's featured speaker was David Woessner, who serves as Executive Vice President of Corporate Development & Regulatory Affairs for LM Industries. Passionate about self-driving technology, Woessner focuses on global market approach, public policy and regulation of self-driving vehicles, and other innovative technologies significant to LM Industries.

This year also debuted a new format for the opening session by including the transportation awards ceremony at the start of the conference as part of the ongoing recognition of special achievement in engineering and construction projects by DOTD and their transportation partners. Special achievements and best projects were honored, demonstrating the dedication in providing the highest quality in transportation infrastructure to their customers, the citizens of Louisiana, and the users of state highways, transit systems, airports, ports, and other public works. DOTD Innovations Showcase award winners were also recognized and received a budget transfer to their respective district's operating budget, with the top finisher having the option to replace a piece of equipment within their own work gang. Student scholarships and design awards



were also recognized and presented a \$1,500 cash award.

Approximately 265 speakers presented on a variety of topics ranging from innovative design, nationwide bridge projects, e-construction, recent research results, and much more. A total of 80 sessions were offered as well as two ethics sessions and Standards of Practice for Boundary Surveys in Louisiana. In addition, tabletop displays, poster presentations, and a two-day industry exhibition featuring transportation technologies and products were also held concurrent to the four-day conference.

LTRC would like to thank our sponsors, speakers, moderators, exhibitors, and attendees for making the 2020 Louisiana Transportation Conference the most successful event to date.



2019-20

# LOCAL TECHNICAL ASSISTANCE PROGRAM

The Louisiana Local Technical Assistance Program (LTAP) is one of 52 centers around the United States dedicated to providing cost effective training, technical assistance, and organizational support to local government public works and transportation agencies. Based at LTRC, Louisiana LTAP is jointly supported by DOTD, FHWA, and LSU. LTAP also supports the DOTD Local Road Safety Program (LRSP), which provides assistance with regional and local agency road safety activities as part of the Louisiana Strategic Highway Safety Program (SHSP).



**50** CLASSES    **37** IN-PERSON    **13** VIRTUAL    **1100+** ATTENDEES

Between July 1, 2019 and June 30, 2020, LTAP conducted **50 classes** (37 in-person, 13 virtual) attended by approximately more than **1,100 participants** from local and state agencies. These classes included Roads Scholar courses, work zone safety mini-workshops, Local Road Safety Program (LRSP) webinars, and Local Public Agency (LPA) courses.



**10** PRESENTATIONS

LTAP gave **10 presentations** at national and statewide conferences & meetings.

**9** MEMBERSHIPS

LTAP maintained active memberships with **9 professional associations** and groups, namely: NLTAPA, NACE, TRB, APWA, ITE, GRITS, ATD, LPESA and SimCap Louisiana.



**\$3.3M**

LRSP BUDGET PER YEAR

**4** **\$1.8M**

LRSP PROJECTS APPROVED FOR FUNDING

DOTD sets aside a budget of **\$3.3 million per year** for LRSP. In 2019, **4 project applications** were approved for funding, which amounted to around **\$1.8 million**.



(above) LTAP quickly converted RS #15 to a virtual platform in light of the COVID-19 pandemic.

(left) Class members participate in a hands-on activity in Basics of Work Zone Safety with Basic Flagger

## COMPLETED PROJECTS

- Online Training—*Roads Scholar #15: Operational Safety for the Public Works First Responder* (converted from scheduled live training)—150 attendees, 2 virtual sessions over 3 days each
- *Basics of Work Zone Safety with Basic Flagger Mini-Workshop*—186 attendees, 8 locations (Baton Rouge—2, Shreveport—1, Amite City—4, Lafayette—1)
- Online Training—*LPA Qualification Core Training Module* (converted from scheduled live training)—74 attendees, 1 virtual session over 3 days
- Online Training—*SimCap Louisiana Educational Meeting #5*—29 attendees, 1 virtual session
- Participated as a core member of the team developing the new *Road Safety 101* classes for Louisiana safety practitioners

## ON-GOING AND CURRENT PROJECTS

- *Roads Scholar #1: Basics of a Good Road*—189 attendees, 8 locations (Lake Charles, Alexandria, Baton Rouge, New Orleans, West Monroe, Benton, Hammond, and Lafayette)
- *Roads Scholar #4: Temporary Traffic Control for Local Agencies*—166 attendees, 6 locations (Bossier City, West Monroe, Alexandria, New Orleans, Lafayette, and Covington)
- *Roads Scholar #8: Successful Supervision for Local Agency Supervisors*—133 attendees, 8 loca-

- tions (Baton Rouge, Lake Charles, Benton, West Monroe, Lafayette, New Orleans, Houma, and Covington)
- *LPA Qualification Core Training Module*—14 attendees, 1 location (Alexandria)
- *LPA Project Development & Design Process for the LPA Responsible Charge*—10 attendees, 1 location (Alexandria)
- *LPA Construction, Engineering & Inspection*—13 attendees, 1 location (Alexandria)
- 2019 Louisiana Parish Engineers and Supervisors Association (LPESA) Fall Conference, Charenton—121 attendees
- FHWA Local Road Safety Data Peer Exchange—35 attendees, 1 location (New Orleans)
- FHWA EDC-5 Roadway Departure Safety Peer Exchange—45 attendees, 1 location (New Orleans)
- LTAP/LRSP Webinar #4—21 attendees, 1 location (Baton Rouge)
- LRSP Lunch Meeting & Presentation with Regional Coordinators—12 attendees, 1 location (Baton Rouge)
- 2nd Annual Day of Trees—47 attendees, 1 location (Opelousas)
- Webinar Hosted: *TRB: Cold as “ICE”—Intersection Control Evaluation Using HCM6*—2 attendees, 1 location (Baton Rouge)
- Webinar Hosted: *LRSP Plan 1: Local Road Safety Plan Implementation*—5 attendees, 1 location (Baton Rouge)



2019–20

# PROFESSIONAL MEMBERSHIPS

## TRANSPORTATION RESEARCH BOARD (TRB) AFFILIATIONS

### Member

- ABG10T–Task Force on Knowledge Management
- ABG20–Transportation Education and Training
- ABG30–Technology Transfer
- ABG40–Library and Information Sciences for Transportation
- ACI440–Fiber Reinforced Polymer Reinforcement
- ACI444–Structure Health Monitoring and Instrumentations
- AFB20–Standing Committee on Roadside Safety
- AFF30–Concrete Bridges
- AFF80–Structural Fiber Reinforced Polymers
- AFP10–Committee on Pavement Management Systems
- AFD40–Committee on Full-Scale Accelerated Pavement Testing
- AFP60–Engineering Behavior of Unsaturated Geomaterials
- AFP80–Committee on Strength and Deformation Characteristics of Pavement Sections
- AFD80–Pavement Structure Modeling and Evaluation
- AFP50–Seasonal Climate Effects on Transportation Infrastructure
- AFS20–Geotechnical Instrumentation and Modeling
- AFP30–Committee on Soil and Rock Properties
- AFS30–Foundations of Bridges and Other Structure
- AFS70–Committee on Geosynthetics
- AFK10–Critical Issues and Emerging Technologies in Asphalt
- ABG10–Conduct of Research
- AFN10–Basic Research and Emerging Technologies Related to Concrete
- AFN30–Durability of Concrete
- ADA50–Transportation Programming and Investment Decision-Making

- AKG40–Mechanics and Drainage of Saturated and Unsaturated Geomaterials
- B0002–Information Services

### Friend

- AFN30–Durability of Concrete
- AFN10–Basic Research and Emerging Technologies Related to Concrete
- AHD37–Bridge Preservation
- AFH50–Concrete Pavement Construction and Rehabilitation
- AFD50–Design and Rehabilitation of Concrete Pavements
- AFD20–Pavement Condition Evaluation
- AFN20–Properties of Concrete
- AFN40–Concrete Materials and Placement Techniques
- AFD90–Pavement Surface Properties and Vehicle Interaction
- AFK20–Characteristics of Asphalt Materials
- AFK30–Non-Binder Components of Asphalt Mixtures
- AFK40–Surface Requirements of Asphalt Mixtures
- AFK50–Structural Requirements of Asphalt Mixtures
- AFH60–Asphalt Pavement Construction and Rehabilitation
- AKP20–Design and Rehabilitation of Concrete Pavements
- AKC50–Concrete Pavement Construction and Rehabilitation
- AKT60–Bridge Preservation
- AKM70–Durability of Concrete
- AKM50–Advanced Concrete Materials and Characterization
- AKP10–Pavement Condition Evaluation
- AKM60–Properties of Concrete and Constituent Materials
- AKB30–Concrete Bridges
- AR080–Highway/Rail Grade Crossings
- AKB20–Steel Bridges
- ANB25–User Liaison Subcommittee

- AFB30–Low Volume Roads Committee
- ANB10(9)–Toward Zero Deaths Subcommittee
- ANB10–Transportation Safety Management
- ACP20–Freeway Operations
- ACP40–Highway Capacity and Quality of Service

## **NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) AFFILIATIONS**

- 05-21: Safety and Performance Criteria for Retroreflective Pavement Markers (Panel Chair)
- 17-76: Guidance for the Setting of Speed Limits
- 20-07 Task 422: User Review of the AASHTO Guide for the Local Calibration of the Mechanistic-Empirical Pavement Design
- 20-07 Task 420: Road User Understanding of Bicycle Signal Symbol Indications
- 03-136: Evaluating the Performance of Right-Turn-On-Red Operation at Signalized Intersections (with single and dual right-turn lanes)
- 17-87: Enhancing Pedestrian Volume Estimation and Developing HCM Pedestrian Methodologies for Safe and Sustainable Communities
- 15-62: Design and Access Management Guidelines for Truck Routes
- 18-17: Entrained Air Void System for Durable Highway Concrete
- 10-104: Recommendations for Revision of AASHTO M 295 Standard Specification to Include Marginal and Unconventional Source Coal Fly Ashes
- 20-24 (131): Mapping the Common Interests of AASHTO Committees

## **OTHER MEMBERSHIPS**

- AASHTO Research Advisory Committee
- AASHTO TRAC and RIDES Advisory Board
- American Composites Manufacturers Association (ACMA)
- American Concrete Institute
- American Institute of Steel Construction
- American Public Works Association
- American Society of Civil Engineers (Bituminous Materials)
- American Society for Testing and Materials
- Association for Talent Development
- Association of Asphalt Paving Technologists (AAPT)
- CAAL Technical Committee

- Construction Certification Committee
- Deep Foundation Institute, DFI
- Deep South Institute of Transportation Engineers
- DOTD Connected and Automated Vehicle Technology Team
- DOTD Work Zone Task Force
- Eastern Transportation Knowledge Network Member (ETKN)
- Equipment Operation Certification Committee
- FHWA Sustainable Pavements Technical Working Group
- Geo-Institute: Engineering Geology and Site Characterization Committee, Geosynthetics Committee, Deep Foundation Committee
- Gulf Region Intelligent Transportation Society (GRITS)
- International Association of Foundation Drilling
- ITI Technical College, Construction Management Curriculum Council
- LATOD - Louisiana State Workers Trainers Group
- Louisiana Engineering Society
- Louisiana Parish Engineers and Supervisors Association
- National Association of County Engineers
- National LTAP Association
- National Society of Professional Engineers
- National Transportation Knowledge Network (NTKN)
- National Transportation Training Directors, Emerging Technology Chair
- Precast/Prestressed Concrete Institute
- Society of Government Meeting Professionals (SGMP)
- Southeast Louisiana Flood Protection Authority
- Southeast Task Force on Technician Training and Qualification
- Southeastern Asphalt User Producer Group
- Special Libraries Association (SLA), Transportation Division
- Tau Beta Pi, College of Engineering Level Honor Society
- Traffic Safety Culture Transportation Pooled Fund, Board Member
- Transportation Curriculum Coordination Council
- USDOT Transportation Disruption and Disaster Statistics (TDADS) Steering Committee
- US Universities Council on Geotechnical Engineering Research (USUCGER)

# LTRC STAFF

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Sheri Hughes, Executive Services Assistant

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Brenda Wolfe, Administrative Assistant

Patrick Mehaffey, Audio Visual Manager

Layne Brown, Training Program Coordinator



## IN MEMORIAM

*We are deeply saddened over the death of LTRC Special Studies Research Administrator Kirk Zeringue, who passed away on Friday, June 26, 2020. Family man, data expert, innovator, colleague, and friend, Kirk's time in this world may have been too brief, but the effects from his presence will be far-reaching for years to come. We are grateful for the many years we were able to witness Kirk's love of numbers, people, and problem-solving work together to benefit our communities and state in such a profound way. He will be greatly missed.*

## Local Technical Assistance Program

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Christopher L. Melson, LTAP Program

Manager

Courtney Dupre, LTAP and LRSP

Business Manager

Leonard P. Marretta, LRSP and LPA

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Rudynah E. Capone, LTAP Innovation and

Technology Transfer Manager

Olivia Phelps, LTAP Training

Program Coordinator

2019–20

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# SPECIAL NOTE ON LTRC'S RESPONSE TO DISTANCE LEARNING DURING COVID-19

In light of stay-at-home orders, quarantines, and new phased-in approaches across the state, training professionals at LTRC have risen to the challenge in successfully moving all adaptable courses to a virtual environment. With new video conferencing delivery methods, instructors and students overcame individual challenges to show that distance education can successfully provide both synchronous (virtual, real-time learning) and asynchronous (independent online learning) opportunities.

In order to continue meeting the training needs of the Department during these ever-changing times, a selection of LTRC's workforce development opportunities have been transitioned into synchronous, virtual classrooms with a live instructor. LTRC continues to work with our training partners to deliver other courses through live, virtual classroom instruction as well.

While the method of delivery may be different, our mission remains the same: to be partners in identifying needs, providing resources, and delivering learning opportunities to equip our workforce for continuous improvement.

A few of the benefits of synchronous, virtual training are as follows:

- The same content can be presented in a real-time, engaging multimedia classroom.
- Travel to a course location is not required.
- Synchronous interaction provides learners with opportunities for experimentation, context-dependent feedback, and constructive problem solving.
- Asynchronous and synchronous communication along with collaboration helps bridge geographical distance.

LTRC has our dedicated team working hard to ensure departmental staff and transportation partners will have the opportunities they need to have access to as many courses as possible. If there are specific training needs, please do not hesitate to reach out. We stand ready to serve.

