Technology Today

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Upcoming Events

August 14
Roadside Safety Systems Design Mentor & Guardrail Designer Training
TTEC

August 15-16
FHWA Roadway Departure Technology Transfer: Roadside Safety Systems Installer Training
TTEC

Augst 21
LPA Project Administration Training
TTEC

September 5
Crumb Rubber Seminar
TTEC

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

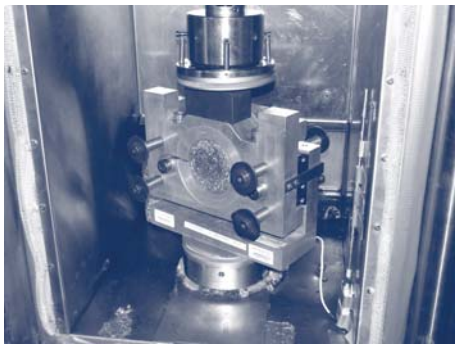
Findings from NCHRP Project Published

NCHRP Project 9-40, "Optimization of Tack Coat for HMA Placement," was conducted by LTRC along with the Texas Transportation Institute and consultant James A. Scherocman. Dr. Louay Mohammad, Professor of Civil and Environmental Engineering and Director of the Engineering Materials Characterization Research Facility (EMCRF) at LTRC, spearheaded this project as its principal investigator.

Selection of an optimum tack coat material and application rate is critical in the development of proper bond strength between pavement layers. The condition of a pavement surface (e.g., new, old, milled, grooved, cracked) will determine the tack coat application rate necessary to achieve proper interface bond strength. Since few guidelines exist for the selection of tack coat material type, application rate, placement, and evaluation, selection of tack coat materials has been based mainly on experience, convenience, and/or empirical judgment. In addition, quality control and quality assurance testing of the tack coat construction process is rarely conducted, resulting in the possibility of unacceptable performance, even premature pavement failure.

The objectives of this research included the following:

- Determine optimum methods, rates, equipment type, and calibration procedures for tack coat application



Louisiana Interlayer Shear Strength Tester

- Establish the best asphalt binder materials for the various uses of tack coats
- Propose new or revised AASHTO methods and practices related to tack coats

In accomplishing these objectives, the researchers evaluated both present and emerging technology in the United States and worldwide.

The research team developed two new test methods and associated criteria for characterizing the quality and performance of tack coat materials—the Louisiana Tack Coat Quality Tester (LTCQT) and the Louisiana Interlayer Shear Strength Test (LISST). The LTCQT is a small test unit that can measure the bond strength of a tack coat in the field. The LISST is a test fixture fitted into a universal testing machine to measure the interface shear strength (ISS) of a tack coat in a field or laboratory specimen. The LISST can

cont. on page 3

New Engineering Lab to Advance Asphalt Technology and Infrastructure Sustainability for Louisiana

(l to r): Students Sam Lee, Harsha Challa, and Jessica Alexander helped with tours of the lab

On May 16, the LSU College of Engineering unveiled the new L. H. Bossier Asphalt Laboratory in Patrick F. Taylor Hall, supported by private donations made through the LSU Foundation.

"By donating this lab, we form a public private partnership connecting industry with academia and advancing the paving industry overall," said Bryan Bossier, president and CEO, Diamond B Construction Co. "We anticipate the result to be better products and practices to ultimately benefit every traveling taxpayer nationwide. The Bossier family is in our third generation of LSU alumni and welcome this opportunity to give something back to the school and state that has been so good to us."

This generous donation has provided space remodeling and equipment that will markedly expand the department's capacity for students to perform hands-on experiments as an important part of their formal coursework. The infrastructure will also allow students and faculty to perform meaningful research in the area of asphalt production.

"Civil engineers design roads, bridges and highways, our infrastructure," said George Z. Voyiadjis, Boyd Professor, Chair and Bingham C. Stewart Distinguished Professor of Engineering, LSU Department of Civil and Environmental Engineering. "This lab will provide our students with cutting edge technology and instruction so they can help to design roads which cost less, ride smoother and last longer. We are profoundly grateful to Bryan Bossier and Diamond B Construction for providing this extraordinary lab for use by our students and faculty. We also commend Bryan and his Dad and their company for their efforts to provide better roadways throughout Louisiana."

Housed in CEE, this lab will be used for undergraduate and graduate classroom demonstrations and laboratory classes. Courses to be taught in this lab include: CE3700 - Engineering Materials Laboratory, CE4650 - Introduction to Asphalt Mixture Design, and CE4670 - Fundamentals of Pavement Design. The laboratory will also be used for student and faculty research involving the composition and qualities of different types of asphalt and ways to improve its installation, function and longevity.

"Establishing the L. H. Bossier Laboratory at LSU is a significant milestone in the advancement of research and workforce development in the area of asphalt technology and infrastructure sustainability for our state and the nation," said Louay N. Mohammad, Irma-Louise Rush Stewart Professor, CEE, and Engineering Materials Characterization Research Facility Director (LTRC). "This laboratory offers a unique opportunity to the industry through training of a workforce in pavement engineering, particularly asphalt technology that benefits the individuals who choose careers in private industry and public sector at the federal, state, or municipal levels. This is vital and relevant to the economy. In addition, it will position LSU amongst the top Tier 1 research universities to compete for research funds in the area of asphalt technology as well as complementing the existing asphalt research and testing and training capabilities at the Louisiana Transportation Research Center (LTRC)." This laboratory will be available to LTRC engineers and technicians for the conduct of the various asphalt related research projects and forensic analysis of pavement failures.

The donor, Bryan Bossier, holds a 1976 B.S. in Business from LSU. His father, Leonard H. "L. H." Bossier, was born and raised in Baton Rouge. Following L.H.'s military service, he obtained a B.S. in Mechanical Engineering from LSU in 1950 and was only a few credit hours short of a Civil Engineering degree.

After graduating, L.H. went to work with his uncle building roads in the Covington area. In 1952, he started his own business and ultimately launched several businesses, most notably Diamond B Construction, an asphalt pavement enterprise. Bossier's concentration has been in asphalt work throughout Louisiana, as well as Texas and Mississippi.

"Pop has a passion for asphalt and now we can pass on the passion to generations of people to learn and improve asphalt," said Bryan Bossier at the ribbon cutting ceremony.

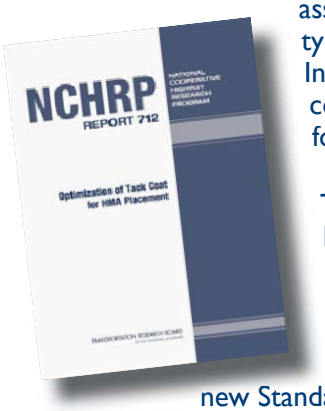
L. H. Bossier has given to a variety of entities at LSU, including the Alumni Association and the Flagship Fund. Both Bossiers have been very involved with the Louisiana Asphalt Pavement Association (L. H. was a Founding Member) and other organizations at the state and national levels.

Bryan now serves as President of Diamond B, which is the top asphalt producer in Louisiana, and has won several national awards for quality road construction. They operate six asphalt plants around the state, and produce hot mix, cold mix and gravel.

(l to r): Dr. Louay Mohammad, Dr. George Z. Voyiadjis, Bryan Bossier, Mrs. Renee Bossier, LSU Chancellor Mike Martin

At the ribbon cutting ceremony, LSU students and Mohammad provided lab tours and demonstrations of the equipment. For more information, contact Mimi LaValle, College of Engineering, mlavall@lsu.edu or (225) 578-5706. *Special thanks to Mimi LaValle for contributing this article.*

Findings from NCHRP Project Published, *cont. from page 1*



assess the effects of the following variables on tack coat performance: pavement surface type and condition, tack coat material type, and tack coat application rate and method. In addition to the test methods, researchers developed a training manual providing a comprehensive presentation of the recommended construction and testing procedures for tack coat materials.

This project's research demonstrated a strong direct relationship between the ISS and the residual application rate of a wide range of tack coat materials. As a result, the research established a proposed minimum laboratory-measured ISS to provide acceptable tack coat performance in the field as well as optimal tack coat application rates for different pavement surface types. The Louisiana Department of Transportation and Development (LADOTD) has implemented these rates in their new Standard Specifications, given in Table 504-1. Research showed that an ISS less than 40 psi measured between surfaces has the potential for future problems.

The new testing and training information established in this project will allow engineers throughout the world to provide improved pavement designs that address delamination failures.

Dr. Mohammad recently presented the results of NCHRP Project 9-40 at the following meetings:

- 11th Annual Tennessee Quality Asphalt Initiative conference , January 18, 2012, Nashville, Tennessee
- 13th Annual Meeting of the Association of Modified Asphalt Producers, February 7 - 9, 2012, Albuquerque, NM
- Rocky Mountain Asphalt User/Producer Group, March 28 – 29, 2012, Henderson

Table 504-1 (Asphalt Tack Coats)

Surface Type	*Rate; Gal/Sq yd (l/Sq m)[1]*
Existing Surface Treatment	*0.12 (0.54)*
New Hot Mix	*0.06 (0.27)*
Existing Hot Mix	*0.09 (0.41)*
Portland Cement Concrete	*0.09 (0.41)*
Cold Planed/Milled	*0.08 (0.36)*

[1]Pending field conditions, the engineer may adjust the rate downward to no less than 0.04.

The full report is available at http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_712.pdf.

Forum of European National Highway Research Laboratories Visits LTRC

The FEHRL delegate visit included a trip to the John James Audubon bridge

On March 29-30, 2012, LTRC hosted members of the Forum of European National Highway Research Laboratories (FEHRL) for an overview meeting with LTRC and the Louisiana Department of Transportation and Development (LADOTD) concerning climate change and the effects of major hurricanes in our state. Members of FEHRL embarked on a 10-day trip that included visits to Washington, DC, New York City, New Jersey, and Louisiana.

FEHRL is a registered International Association with a permanent headquarters based in Brussels. FEHRL provides coordinated structure for cooperation between more than 40 national research and technical centers and with third parties including industry, academia, and others. Ten members from FEHRL made the trip to LTRC representing Germany, Australia, Israel, Sweden, France, Denmark, Norway, and Belgium.

Secretary LeBas welcomed the delegation after lunch on Thursday and highlighted many of the challenging projects our state has faced in the past several years. She noted two very important bridge projects, the I-10 twin span bridge re-build project and the completion of the John James Audubon Bridge.

Climate change presentations began with FEHRL member Markus Auerbach presenting "Adapting Road Traffic Infrastructure to Climate Change." FEHRL has adopted a long-term approach to implementing its Strategic European Roads Research Program (SERRP). A major part of the SERRP program is the Forever Open Road concept. The Forever Open Road idea is based on adaptable, automated, and climate change resilient roads. Auerbach explained that with using what they have today with the best of what's to come, they can produce a 5th generation road. This concept can be applied to a road, whether motorway, rural or urban, and regardless or region or country.

Skip Paul introduced the FEHRL committee to the mission of LTRC. He explained that the goal of LTRC is to merge the resources of LADOTD/LTRC and universities to provide transportation related research, education and training. Kevin Gaspard then continued discussion of LTRC projects with his presentation of "Submerged Road Research." Gaspard's presentation included many photographs of submerged roads during Hurricane Katrina and noted many post-Katrina recommendations that included GIS mapping.

Arthur D'Andrea gave a detailed presentation on the repairs, rehabilitation, and challenges of the I-10 twin span project after Hurricane Katrina. Max Sheppard closed the Thursday discussion with "Hurricane Generated Wave Loading on Coastal Bridges."

Friday morning dialogue weighed heavily on hurricane research with a presentation from Chester Wilmot on evacuation planning, improvements, and studies. Joshua Kent led discussion on elevation and subsidence studies on levees and roads, while the Army Corps of Engineers were on hand to discuss hurricane and storm damage risk reduction.

Bridge presentations continued on Friday afternoon with Paul Fossier leading discussion on the John James Audubon Bridge. Fossier explained the John James Audubon Bridge serves as the only bridge structure on the Mississippi River between Natchez, Mississippi, and Baton Rouge, Louisiana which is approximately 90 river miles long. A field visit to the John James Audubon Bridge followed.

FEHRL and LTRC share the goal of bringing together innovative technology and concepts by harvesting knowledge. By sharing their expertise, both organizations hope to transform the way infrastructure is built, maintained, and operated.

To learn more about FEHRL and the Strategic European Road Research Program (SERRP) program, visit www.fehrl.org. Presentations noted above can be found at http://www.ltrc.lsu.edu/fehrl.html.

2012 Louisiana Transportation Safety Summit

Louisiana's Transportation Safety Summit brought together more than 300 safety stakeholders from around the state to review the state's progress in reaching "Destination Zero Deaths." The two-day conference featured inspirational remarks from federal, state, regional, and local officials; informative work sessions; and networking opportunities.

The summit was held April 3-4 in Baton Rouge. It was sponsored by the Department of Transportation and Development (DOTD) and provided attendees an opportunity to reflect on their individual accomplishments, but more importantly on what everyone has achieved together.

Keynote speaker DOTD Secretary Sherri LeBas focused on Louisiana's record of achievement, telling attendees the SHSP is not a DOTD plan but a plan supported by everyone in the room. She recognized the efforts of key state partners—the Louisiana Highway Safety Commission (LHSC) and the Louisiana State Police (LSP).

Following the opening remarks, the attendees learned more about Louisiana's "Destination Zero Deaths" and the elements of the SHSP. Dan Magri with DOTD and Marie Walsh with the Local Technical Assistance Program (LTAP) provided an overview of the national "Toward Zero Deaths" initiative.

The summit was a mix of plenary and breakout sessions. Conference organizers made an effort to include a wide range of topics for the breakout sessions. Summit session topics included road safety assessments, quiet zones, alcohol related accidents, distracted driving, vulnerable road users, young drivers, rail safety, and an update on the latest additions to the Highway Safety Manual.

Continued reductions in Louisiana's traffic fatalities and serious injuries depend on the active support and involvement of a diverse group of safety stakeholders. To implement Louisiana's Strategic Highway Safety Plan (SHSP), stakeholders are asked to join and participate in Regional Safety Coalitions. Be a part of this exciting opportunity to make a difference in Louisiana.

Federal and state officials show their signed letter of support for the SHSP. From left to right Wes Bolinger, FHWA; Keith Gibson, FMCSA; Timothy Fitten, NHTSA; Sherri LeBas, DOTD; Marie Walsh, LTAP; Brian Wynne, LSP; and John LeBlanc, LHSC.

If you are interested in learning more or participating in the implementation of Louisiana's Strategic Highway Safety Plan, send an email to Autumn Goodfellow-Thompson at autumn.goodfellow-thompson@la.gov.

Save the Date!

2013 Louisiana Transporation Conference
February 17-20, 2013
River Center
Baton Rouge, LA

Visit the conference website at
www.ltrc.lsu.edu/ltc_13
for more details as the conference approaches.

Registration will begin in fall 2012.

New LTRC Foundation Awards Recognize Outstanding Researchers

The LTRC Foundation has established two awards to recognize the efforts of transportation researchers at LADOTD and Louisiana universities. The Outstanding LADOTD Researcher Award recognizes a researcher at the department who has made significant contributions in the broad area of transportation. The Outstanding Young Researcher Award acknowledges the achievements of a mid-career researcher at one of Louisiana's universities with a strong transportation-related record in research, education, and service. The awards will be given biennially, and recipients will be recognized with a plaque and $1,000 award.

(left photo): Dr. Xingwei Chen (middle) pictured with LADOTD Chief Engineer Richard Savoie and Secretary Sherri LeBas
(right photo): Dr. Steve C.S. Cai of LSU

The award selection committee is comprised of members of the LTRC Foundation Board of Directors. Selection of the awardees is based on the applicant's overall record in research, technology transfer, and service activities, such as technical committees, review panels, etc. For the Outstanding Young Researcher Award, particular consideration will be given to the applicant's success in securing external research funding from federal agencies, domestic and international organizations, and industry.

Xingwei Chen, Ph.D., P.E., is the 2011 Outstanding LADOTD Researcher. The award was presented at the department's employee awards ceremony in May. Chen is a pavement design engineer in LADOTD's pavement and geotechnical service section, a position he began in 2010. Before that, he worked as a research associate at LTRC. He received his Ph.D. in 2005 from the School of Transportation Engineering at Tongji University in Shanghai, China. Chen is the author or co-author of over 40 refereed journal and peer-reviewed conference papers. While at LTRC, he was involved in the following research projects: Finite Element Simulation of Structural Performance on Flexible Pavements with Stabilized Base/Treated Subbase Materials under Accelerated Loading, Evaluation of Current Louisiana Flexible Pavement Structures Using PMS Data and New M-E Pavement Design Guide, and Mechanistic Flexible Pavement Overlay Design Program.

Steve C.S. Cai, Ph.D., P.E., of LSU is the 2011 Outstanding Young Researcher. He is the Edwin B. and Norma S. McNeil Distinguished Professor in the department of civil and environmental engineering. He received his Ph.D. in 1993 from the University of Maryland, and began his service at LSU as a tenure-track professor in 2001. Since then, he has been principal investigator for more than 50 federal, state, government, and university funded projects totaling over $5 million. His research interests include bridge performance evaluation, instrumentation, and testing; applications of advanced materials, long-span bridge aerodynamics, and wind engineering.

Nominations for the 2013 awards will be accepted in the fall of 2012. A call for nominations will be posted on the LTRC website and DOTD intranet and announced via email. The 2013 awards will be presented at the Louisiana Transportation Conference awards luncheon on February 20, 2013.

Staff Updates and Accomplishments

Teaching Associate **Gisele Landry** attended EQ-I 2.0 (Emotional Intelligence) certification training in Raleigh, North Carolina, on May 26-27, 2012. Gisele passed the exam to become a Certified EQ-i Practitioner/Instructor.

Training and Development Specialist **Allison Landry** attended the 2012 Society of Government Meeting Professionals National Education Conference held in New Orleans, Louisiana on May 13-18, 2012. Allison attended a 3-day class is preparation to become a Certified Government Meeting Planner (CGMP). LTRC would like to congratulate Allison on passing the exam and receiving her CGMP credentials.

LTRC congratulates materials research employees, **Md Sharear Kabir** and **Patrick Icenogle** who recently passed their professional engineers examination.

Dr. Vijaya (VJ) Gopu, Associate Director for External Programs, was elected as the Chair of the ASCE Committee on Wood, which is one of the eight Technical Administrative Committees in the Structural Engineering Institute.

Recently Published

Final Report and Technical Summary 471
Evaluation of the Base/Subgrade Soil under Repeated Loading
Murad Y. Abu-Farsakh and Qiming Chen, Ph.D., P.E.

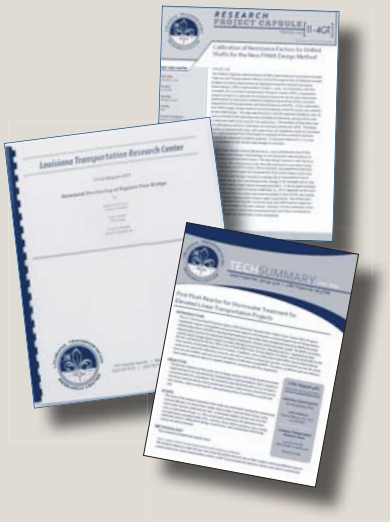
Final Report and Technical Summary 434
Statewide Traffic Safety Study Phase II: Identification of Major Traffic Safety Problem Areas in Louisiana
Chester G. Wilmot, Haoqiang Fu, Mini Radhakrishnan, and Meisam Akbarzadeh

Final Report and Technical Summary 487
Safety Improvement from Edge Lines on Rural Two-Lane Highways
Xiaoduan Sun and Subasish Das

Final Report and Technical Summary 482
Evaluation of Current Louisiana Flexible Pavement Structures using PMS Data and New Mechanistic-Empirical Pavement Design Guide
Zhong Wu and Xiaoming Yang

Final Report and Technical Summary 485
Development of Surface Friction Guidelines for LADOTD
Zhong Wu and Bill King

Final Report and Technical Summary 490
Implementation of Warranties in State Contracts for Highway Construction
Mark Martinez



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Technology Today
Publication Statement

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