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GOVERNMENT, INDUSTRY, AND ACADEMIA



LOUISIANA TRANSPORTATION RESEARCH CENTER

2011-12 Annual Report



SHERRI H. LEBAS, P.E.
SECRETARY



WILLIAM L. JENKINS, PH.D.
INTERIM CHANCELLOR

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 richer 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, and environmental studies.

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-term and long-term research and provides

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).

LTRC merges the resources of the state and local government, universities, and private industry to identify, develop, and implement new technology to improve the state's transportation system. By harnessing these valuable resources, LTRC is empowered to find innovative solutions to Louisiana's transportation problems.

To enhance the center as the focus for transportation-related research, technology transfer, and education in Louisiana, the LTRC Foundation, a non-profit organization, has been established. 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.

FOR ADDITIONAL INFORMATION

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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, 2011–June 30, 2012. The center is sponsored jointly by the Louisiana Department of Transportation and Development and Louisiana State University.



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FACILITIES



LTRC

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 LSU and DOTD's resources to pursue its mission.

LTRC houses more than 90 employees and up to 30 students in two adjacent facilities. The LTRC 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, and pavements. The 14,000-square foot Transportation Training and Education Center (TTEC) houses a lecture hall, a computer-based training classroom, and two general classrooms that are all equipped with advanced education and training equipment and distance learning/video-conferencing capabilities. A comprehensive transportation library and offices are also included.

LTRC has identified research areas of strategic importance and has developed expanded capabilities for concentration in several areas: the Engineering Materials Characterization and Research Facility (EMCRF), a laboratory facility specializing in fundamental materials characterization; the Geotechnical Engineering Research Laboratory (GERL), a laboratory focusing on transportation earth-works, structural foundations, and geosynthetics; Pavement on the Move (POM), a

multi-use mobile laboratory for collecting data from field construction projects as well as research and training; 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™).

The addition of 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 is a budget entity of the Louisiana Department of Transportation and Development. Funding is a combination of State, State Planning and Research (Part II, Federal), Innovative Bridge Research and Deployment (100 percent federal), Surface Transportation Program (STP-federal), and external contracts and grants, such as the National Cooperative Highway Research Program, the U.S. Army Corps of Engineers, and the National Science Foundation.



TTEC



ALF

DIRECTOR'S MESSAGE

To: Sherri H. LeBas, P.E. | Secretary | DOTD
William L. Jenkins, Ph.D. | Interim Chancellor | LSU
Richard Savoie, P.E. | Chief Engineer | DOTD
Richard Koubek, Ph.D. | Dean, College of Engineering | LSU

This past year has been very productive and was highlighted by the selection of the National Center for Intermodal Transportation for Economic Development Competitiveness (NCITEC) as one of ten Tier One University Transportation Centers by the US DOT's Research and Innovative Technology Administration (RITA). LTRC (through its affiliation with LSU) is a member of this Mississippi State University led consortium along with the University of Mississippi, Hampton University, and the University of Denver. This grant awarded \$3.5 million in FY 2011 and another \$3.5 million in FY 2012. The LTRC/LSU share is \$600,000 each year with a 100% match that will generate \$2.4 million of research in the intermodal, freight, and safety areas.

The research program, in large part because of the UTC award, is producing perhaps its largest research program ever with sixty-six active research projects. Due to the UTC award, we are conducting research in non-traditional areas of intermodal and freight. Seven new UTC studies were initiated this year with at least an equal number expected to be generated next year. In addition, we have initiated three syntheses for the Southeast Transportation Consortium, which are funded through the Transportation Pooled Fund Program. Other externally funded projects include three National Cooperative Highway Research Program projects, four Innovative Bridge Research and Development projects and a project for the National Science Foundation.

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

The LTRC Transportation Curriculum Council (TCC) has been meeting quarterly. 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 includes a representative cross section of knowledgeable individuals from the various technical and supportive disciplines necessary to the conduct of the Department's mission, thereby reflecting the diverse needs of the organization and the needs of its public and private industry transportation partners. Current activities included major revisions to DOTD's Structured Training Program.

Finally, I would like to point out the work being conducted by our Louisiana Local Technical Assistance Program (LTAP). This program has been active at LTRC providing twenty-five years of service to local transportation agencies through technical training, safety training, technical assistance, and technology transfer activities. Highlights include the development and delivery of Local Public Agency (LPA) courses for agencies that receive state and federal funding. Also, the Louisiana LTAP has been instrumental in the implementation of the Louisiana Strategic Highway Safety Plan through the development and management of over \$10 million in low-cost safety improvements for local road safety projects.

Respectfully submitted,



Harold "Skip" Paul, P.E., Director

COMPLETED RESEARCH

COMPLETED PROJECTS

LTRC PROJECT NO. / AGENCY	PRINCIPAL INVESTIGATOR	PROJECT TITLE
06-4B / LTRC	Dr. Louay Mohammad	Optimization of Tack Coat for HMA Placement
09-4C / LTRC	Dr. Tyson Rupnow	Evaluation of Ternary Cementitious Combinations
10-1C / LTRC	Dr. Tyson Rupnow	Evaluation of the Surface Resistivity Measurements as an Alternative to the Rapid Chloride Permeability Test for Quality Assurance and Acceptance
07-7P / ULL	Dr. Xiaoduan Sun	Safety Improvement from Edge Lines of Rural Two-Lane Highway
09-2P / LSU	Dr. Mostafa Elseifi	Implementation of the Rolling Wheel Deflectometer (RWD) in PMS and Pavement Preservation
09-7P / LTRC	Dr. Zhong Wu	Construction and Accelerated Pavement Testing of TTI Pavement Test Sections
11-2P / Inner Corridor Technologies	Jennifer Harrison	Development of a DOTD GPS Technology Management Plan

COMPLETED PROJECTS (PENDING PUBLICATION)

LTRC PROJECT NO. / AGENCY	PRINCIPAL INVESTIGATOR	PROJECT TITLE
09-5C / LTRC	Patrick Icenogle	Evaluation of Non-Destructive Technologies for Construction Quality Control of HMA and PCC Pavements in Louisiana
11-4GT / LTRC	Dr. Murad Abu-Farsakh	Calibration of Resistance Factors for Drilled Shafts for the New FHWA Design Method
11-6GT / LSU	Dr. Joshua Kent	Quantifying the Key Factors that Create Road Flooding
06-2SS / LTRC	Dr. Chester Wilmot	Development of a Time-Dependent Hurricane Evacuation Model for the New Orleans Area - Phase 2
07-3ST / LSU	Dr. Steve C.S. Cai	Repairing/Strengthening of Bridges with Post-Tensioned FRP Strands and Performance Evaluation
08-3ST / LSU	Dr. Gouping Zhang	Evaluation of Design Methods to Determine Scour Depths for Bridge Structures
09-4ST / LSU	Dr. Guoqiang Li	A Shape Memory Polymer based Self-healing Sealant for Expansion Joint
11-1TIRE / LSU	Dr. Marwa Hassan	Photocatalytic Pervious Concrete for Ambient Air Purification and Water Quality Improvement
11-2TIRE / LSU	Dr. Gefu Ji	A Novel Fire Resistant FRP for Externally Bonded Concrete Repair
11-3TIRE / LTU	Dr. Arun Jaganathan	An Ultra Low Cost Wireless Sensor Network for Real-Time Monitoring of Strands in Cable Stay Bridges
11-4TIRE / LTU	Dr. Erez Allouche	Design, Fabrication and Testing of a Low Cost, Highly Durable, "Green" Median Barrier

ACTIVE RESEARCH

LTRC PROJECT NO. / AGENCY	PRINCIPAL INVESTIGATOR	PROJECT TITLE	START DATE	END DATE
07-1B / LTRC	Mr. Bill King	Evaluation of Warm Mix Asphalt Technology in Flexible Pavements	3/15/09	3/31/13
10-1B / LTRC	Dr. Louay Mohammad	Field versus Laboratory Volumetrics and Mechanical Properties	8/1/09	3/31/12
10-4B / LTRC	Dr. Louay Mohammad	Development of Performance Based Specifications for Louisiana Asphalt Mixtures	4/1/11	3/31/14
10-6B / LSU	William H. Daly	Implementation of GPC Characterization of Asphalt Binders at Louisiana Materials Laboratory	6/1/10	7/31/12
11-1B / LTRC	Md. Sharear Kabir	Validity of Multiple Stress Creep Recovery Test for DOTD Asphalt Binder Specification	9/1/10	6/30/13
11-2B / LTU	Nazimuddin M. Wasiuddin	Evaluation of Dynamic Shear Rheometer Tests for Emulsions.	9/15/10	1/14/12
11-3B / LTRC	Bill King	Testing and Analysis of LWT and SCB Properties of Asphaltic Concrete Mixtures	4/1/11	3/31/13
11-4B / LTRC	Dr. Louay Mohammad	Modulus Based Construction Specification of Earthwork and Unbound Aggregate	10/7/10	4/6/13
12-4B / LTRC	Dr. Louay Mohammad	Performance of WMA Technologies: Stage II – Long-term Field Performance	4/29/11	7/28/16
12-3C / LTRC	Dr. Marwa Hassan	Investigation of Best Practices for Maintenance of Concrete Bridge Railings	7/1/12	6/30/13
12-4C / LTRC	Dr. Tyson Rupnow	Evaluation of Portland Cement Concrete with Internal Curing Capabilities	5/1/12	10/30/13
12-5C / LTRC	Dr. Tyson Rupnow	Comparison of Conventional and Self-Consolidating Concrete for Drilled Shaft Construction	5/1/12	10/30/13
05-1GT / LTRC	Dr. Murad Abu-Farsakh	Field Demonstration of New Bridge Approach Slab Designs and Performance	8/1/08	6/30/13
06-3GT / LTRC	Gavin Gautreau	Field Evaluation of Roller Integrated Intelligent Compaction Monitoring	11/1/11	10/31/13
10-2GT / Dataforensics, LLC	Dr. Scott Deaton	Geotechnical Information Database – Phase 2	3/10/11	9/9/12
10-3GT / LTRC	Mr. Khalil Hanifa	Design Values of Resilient Modulus of Stabilized and Non-stabilized Base	9/1/10	12/31/12
11-2GT / LTRC	Dr. Murad Abu-Farsakh	Field Instrumentation and Testing to Study Set-Up Phenomenon of Piles Driven into Louisiana Clayey Soils	12/1/10	1/30/14
11-3GT / LTRC	Dr. Murad Abu-Farsakh	Accelerated Load Testing of Geosynthetic Base Reinforced Pavement Test Sections	12/1/10	12/31/13

ACTIVE RESEARCH

LTRC PROJECT NO. / AGENCY	PRINCIPAL INVESTIGATOR	PROJECT TITLE	START DATE	END DATE
13-2GT / LTRC	Gavin Gautreau	Implementation of Slag Stabilized Blended Calcium Sulfate (BCS) in a Pavement Structure	7/1/12	6/30/13
12-1AD / LTRC	Harold "Skip" Paul	Administration of LSU Partnership with the National Center for Intermodal Transportation for Economic Competitiveness	3/1/12	12/31/13
10-3P / LTRC	Dr. Leticia Santos da Rocha Courville	LED Traffic Signal Lifetime Management System	11/1/10	7/31/13
10-4P / ULL	Dr. Mohammad Jamal Khattak	Development of Cost-Effective Pavement Treatment Selection and Treatment Performance Models	9/1/10	6/30/13
11-3P / LTRC	Mark Martinez	The Rideability of a Deflected Bridge Approach Slab (LTRC Project 02-2GT Continuation: Phase II)	4/1/11	3/31/13
12-1P / LTRC	Kevin Gaspard	Assessment of Pavement Distresses caused by Trees on Rural Highway	2/1/2012	7/1/2014
12-2P / LTRC	Kevin Gaspard	Assessment of Environmental, Seasonal and Regional Variations in Pavement Base and Subgrade Properties	9/1/11	8/31/13
12-4P / LTRC	Dr. Zhong Wu	Development of DARWin-ME Design Guideline for Louisiana Pavement Design	2/1/12	8/1/13
12-5P / LTRC	Dr. Zhong Wu	Evaluation of DOTD Aggregate Friction Rating Table by Field Measurements	2/1/12	2/1/15
12-7P / LTRC	Dr. Zhong Wu	Roller Compacted Concrete Over Soil Cement Under Accelerated Loading	5/1/12	4/30/14
12-11P / FHWA	Mark Martinez	Field Validation of Equivalent Modulus for Stabilized Subgrade Layer	5/1/12	4/30/14
13-2P / ULL	Dr. Xiaoduan Sun	A Comprehensive Study on Pavement Edge Line Implementation	6/15/22	6/14/13
09-1PF / LTRC	Mark Morvant	Southeast Transportation Consortium	9/1/09	8/30/12
12-1PF / Oklahoma State University	Dr. Kelvin Wang	Traffic and Data Preparation for AASHTO MEPDG Analysis and Design	9/1/11	8/31/14
12-2PF / Florida International University	Dr. Hesham Ali	Asphalt Surface Treatments for Pavement Preservation	6/15/12	6/14/13
12-3PF / Georgia Tech Research Corporation	Dr. Baabak Ashuri	Best Practices for Determining Value of Research Results	6/1/12	5/31/13
12-5PF / Thompson Engineering	Richard Sheffield	STC Synthesis of Research Results for Water Quality Management at Construction Sites	5/1/12	4/30/13
12-4SA / LSU	Pallavi Bhandari	DOTD Support for UTC Project: Development of a Tool for Documenting, Tracking, Recording, and Analyzing Improvements to Intersection Sites and Roadway	7/1/12	12/31/13

ACTIVE RESEARCH

LTRC PROJECT NO. / AGENCY	PRINCIPAL INVESTIGATOR	PROJECT TITLE	START DATE	END DATE
13-2SA / ULL	Dr. Xiaduan Sun	DOTD Support for UTC Project: Developing a Highway Safety Fundamentals Course	7/1/12	6/30/13
08-3SS / ULL	Dr. Xiaoduan Sun	Developing Louisiana Crash Reduction Factors	11/1/09	8/31/12
09-2SS / LTRC	Dr. Chester Wilmot	Enhancing Calibrated Peer Review for Improved Engineering Communication Education	9/1/08	8/31/12
10-3SS / Cambridge Systematics	Dr. Susan Herbel	Automated Enforcement and Highway Safety	6/1/11	5/31/13
10-4SS / GEC, Inc.	Thomas Swanson	Truck Facility Access Design Guidelines	4/25/11	4/24/13
10-5SS / LSU	Dr. Helmut Schneider	Developing Inexpensive Crash Countermeasures for Louisiana Local Roads	1/17/11	1/16/13
10-6SS / LSU	Dr. Sherif Ishak	Establishing an Intelligent Transportation Systems (ITS) Lab at LTRC (Phase II)	8/20/10	8/19/13
11-2SS / LSU	Dr. Sherif Ishak	Measuring Effectiveness of Ramp Metering Strategies on I-12	4/1/11	3/31/13
11-3SS / C-K Associates	Tre Wharton	LOOP Environmental Monitoring: 2011-2013 Beach Elevation, Beach Vegetation, Land Loss and Habitat Changes Surveys	4/12/11	4/11/14
12-2SS / LSU	Dr. Sherif Ishak	History of the Implementation of AASHTO and Louisiana DOTD Road Design Standards	8/1/12	1/31/14
12-4SS / UNO	Dr. John Renne	DOTD Support for UTC Project: Development of Minimum State Requirements for Local Growth Policies	7/1/12	12/31/13
13-3SS / LSU	Dr. Peter Kelle	DOTD Support for UTC Project: Development of Performance Measurement for Freight Management	7/1/12	12/31/13
13-5SS / DOTD	Dr. Chester Wilmot	DOTD Support for UTC Project: Improving Freight Crash Incident Management	7/1/12	12/31/13
13-6SS / LSU	Dr. Jared Llorens	DOTD Support for UTC Project: Economic Impact Analysis of Short Line Railroads in the State of Louisiana	7/1/12	12/31/13
13-7SS / UNO	James Amdal	DOTD Support for UTC Project: Use of Containers to Carry Bulk and Breakbulk Commodities and its Impact on Gulf Region Ports and International Trade	7/1/12	12/31/13
13-8SS / UNO	Dr. Asaf Ashar	DOTD Support for the UTC Project: The Impact of Modifying Jones Act on the US and Louisiana	7/1/12	12/31/13
13-9SS / LTRC	Dr. Chester Wilmot	Investigation into the impact of privatizing civil engineering operations in Louisiana DOTD	8/1/12	1/31/13
07-1ST / LTRC	Dr. Murad Abu-Farsakh	Structure Health Monitoring of the I-10 Twin Span Bridge Over Lake Pontchartrain	11/1/07	7/31/12
07-4ST / LSU	Dr. George Z. Voyiadjis	Integral Abutment Bridge for Louisiana's Soft and Stiff Soils	10/1/07	4/30/13

ACTIVE RESEARCH

LTRC PROJECT NO. / AGENCY	PRINCIPAL INVESTIGATOR	PROJECT TITLE	START DATE	END DATE
08-2ST / LSU	Dr. Steve C.S. Cai	Monitoring Bridge Scour Using Fiber Optic Sensors	1/1/09	12/30/12
09-1ST / LTU	Dr. Aziz Saber	Load Distribution and Fatigue Cost Estimates of Heavy Truck Loads on Louisiana State Bridges	4/1/09	9/30/12
10-4ST / Ocean Engineering Assoc., Inc.	D. Max Sheppard	Development of Wave and Surge Atlas for the Design and Protection of Coastal Bridges in South	5/2/11	10/1/13
10-5ST / Wiss, Janney, Elstner Assoc., Inc.	Jonathan McGormley	Developing Prestressed Girder Transportation Guidelines	5/2/11	9/1/12
12-1ST / LTRC	Dr. Ayman Okeil	Data Collection and Evaluation of Continuity Detail for John James Audubon Bridge #2	1/3/12	1/2/14
12-2ST / LTRC	Dr. Vijaya Gopu	Field Performance of Timber Highway Bridges: A National Study	1/3/12	6/30/13
12-3ST / LTRC	Dr. Vijaya Gopu	Morganza Floodway Bridge Bent Repair using Carbon Fiber Reinforced Polymers (CFRP)	6/1/12	6/30/14
12-1TIRE / UNO	Dr. Malay Ghose Hajra	Comparative Evaluation of Pile Set Up and Axial Capacity of Driven Piles Installed Using Impact Hammer versus Vibratory Pile Driving Equipment	7/1/12	6/30/13
12-2TIRE / LTU	Nazimuddin M. Wasiuddin	A Novel Dewetting and Spreading Based Moisture Susceptibility Test Method for Hot and Warm Mix Asphalt	7/1/12	6/30/13
12-3TIRE / LSU	Dr. Sherif Ishak	Modeling the Effect of Gusty Hurricane Wind Force on Vehicles Using LSU Driving Simulator	7/1/12	6/30/13
12-4TIRE / ULL	Dr. Chris Carroll	Preliminary Analysis of Polymer Concrete Used for Bridge Deck Joint Repairs	7/1/12	6/30/13

LSU: Louisiana State University

LTU: Louisiana Tech University

UNO: University of New Orleans

ULL: University of Louisiana at Lafayette

RESEARCH HIGHLIGHTS

LTRC IS MEMBER OF A CONSORTIUM RECEIVING \$3.5M AWARD FROM THE U.S. DEPARTMENT OF TRANSPORTATION



As a member of the Mississippi State University-led consortium that was recently awarded a \$3.5 million grant by the U.S. Department of Transportation (USDOT), LTRC will be assisting in establishing the National Center for Intermodal Transportation for Economic Competitiveness (NCITEC).

With this grant, the new center will work to promote the development of an integrated, economically competitive, efficient, safe, secure, and sustainable national intermodal transportation network by integrating all transportation modes both for freight and passenger mobility. The consortium includes, in addition to Mississippi State University and LTRC at LSU, the University of Denver, Hampton University, and the University of Mississippi.

The new center and its members will serve the transportation industry through research, education, workforce development, and technology transfer activities. The center's areas of expertise will include intermodal planning, safety and security, public policy, workforce development, and economic competitiveness. The NCITEC will focus on the economics, assessment, design, and development of planning methodologies, operational tools, technology and human resources needed to improve intermodal connectivity and capacity, and to reduce congestion in the nation's transportation system. The NCITEC will also seek to improve the transportation workforce's capacity and capability.

The competition included 46 proposals from universities around the country; of those, 10 were selected because of the importance of their theme and the combined team of experts.

In support of the center's goal, LTRC has recently awarded the following projects that are currently underway.

- The Impact of Modifying Jones Act on the US Domestic Shipping, Asaf Ashar, UNO
- Improving Freight Crash Incident Management, Chester Wilmot, LTRC/LSU
- Development of a Tool for Documenting, Tracking, Recording and Analyzing Improvements to Intersection Sites and Roadway Departures in Curve Locations, Helmut Schneider, LSU
- Development of Minimum Requirements for Local Growth Management Policies, John Renne, UNO
- Development of Performance Measurement for Freight Management, Peter Kelle, LSU
- Economic Impact Analysis of Short Line Railroads, Jared Llorens, LSU
- Developing a Highway Safety Fundamentals Course, Xiaoduan Sun, ULL

To learn more about these projects or the NCITEC, please visit: <http://www.ncitec.msstate.edu/> or contact VJ Gopu v.gopu@la.gov or 225-767-9102.

RESEARCHERS BETTER DEFINE VIBRATION IMPACTS OF PILE DRIVING

Researchers have recently recommended a change in pile driving damage monitoring distance to go from 500 ft. to 200 ft. The benefits of reducing vibration monitoring distances may be quantified by comparing costs of pre-construction surveying using different monitoring distances (unless determined otherwise due to nearby sensitive or historical structures). The benefits of these reduced pre-construction areas/costs should be evaluated against potential legal issues from nearby structures.

The major objective of this study was to provide readily implementable recommendations for monitoring and controlling ground and structure vibrations generated by pile driving. The study recommended vibration thresholds for the Department, and provides a logical and rational method for evaluating pile driving vibration monitoring distances.

Piles have often been used to transfer heavy loads to stronger soil strata or temporarily retain earth or water in highway and

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RESEARCH HIGHLIGHTS

CONCRETE TESTING DEVICE PROVIDES SUBSTANTIAL SAVINGS

LTRC researchers recently implemented a new quality assurance testing device called the surface resistivity device. Implementation of the device began with the I-10 Twin Spans and Caminada Bay bridges. The cost benefit analysis shows that DOTD will save about \$101,000 in personnel costs and an estimated \$1.5 million in quality control costs, which will indirectly benefit the Department for current operations. The savings will be much greater for DOTD, suppliers, and contractors when permeability requirements are applied statewide.



Surface resistivity meter saves the state \$1.5 million

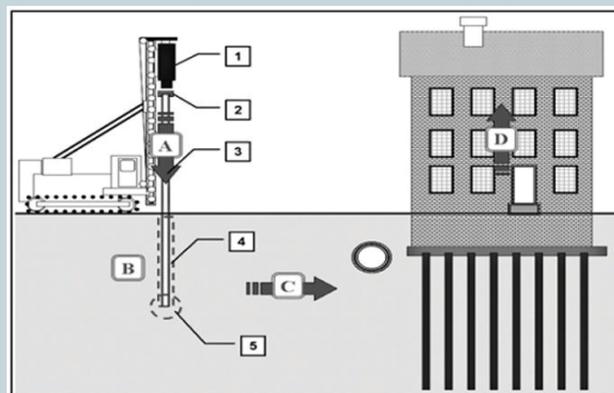
Because of successful research findings, surface resistivity measurements have been included in DOTD specifications, and a TR test method (with relevant training material) is being implemented. In fact, within six months of this project's completion, LTRC purchased 11 surface resistivity meters for distribution and provided training around the state for preparations of upcoming statewide permeability requirements.

This equipment gives an indication of a concrete's ability to resist chloride ion penetration, which is important because structural steel corrosion will not occur if water and chloride ions are not allowed to reach it.

Research showed that the use of surface resistivity devices will benefit the state economically by significantly reducing both the cost of testing equipment and the number of man-hours required to conduct quality assurance testing. Research also showed a very strong correlation between the surface resistivity device and existing conventional testing. Correlations found also show 28-day surface resistivity measurements can be used to predict 56-day rapid chloride ion penetration.

RESEARCHERS BETTER DEFINE VIBRATION IMPACTS OF PILE DRIVING, (CONTINUED)

bridge construction. DOTD spends millions of dollars annually on pile foundations. Despite the advantages of driven piles, its installation processes inevitably cause the surrounding ground to vibrate. The intensity of the vibration depends on the physical properties of the pile, pile installation method, and the soil. Depending on the intensity of the ground vibration, it can occasionally cause varying degrees of damage to adjacent buildings and structures, which must be monitored before and after pile driving.



Woods, R.D., *Dynamic effects of pile installations on adjacent structures*. 1997, National Academy Press: Washington, D.C.

Technical Assistance

LTRC's technical assistance program provides laboratory testing, field testing, and forensic investigation in direct response to Departmental inquiries for expert analysis on DOTD projects. LTRC also provides assistance to state universities for laboratory or field testing on research projects not funded by LTRC.

2011-12 TECHNICAL ASSISTANCE HIGHLIGHTS

I-10 Twin Span Friction Study: The purpose of this project was to perform a friction study on I-10 bridges with its adjacent acceleration and deceleration lanes due to abnormal wet weather accident reports. The results of the study indicated that pavement friction improvements were warranted.

I-49 Pavement Rehabilitation Evaluation: Approximately 12.5 miles of interstate on I-49 were in need of rehabilitation. Several alternates were under consideration, with the top two being either an asphaltic concrete overlay or a concrete overlay. LTRC conducted testing on this roadway to assess its in-place strength. These values were then used to calculate overlay thicknesses so that a cost benefit analysis could be performed.

LA 10 Evaluation: LA 10 was a roadway with severe distresses. The district needed to know whether the road should be reconstructed or if it could be rehabilitated with a major cold plane and overlay. Results of the testing indicated that the roadway should be reconstructed.

GPR Data for Pavement Management System: The purpose of this project was to establish a uniform pavement layer coding system to be utilized by consultants collecting ground penetrating radar (GPR) data on roadways for the Pavement Management System.

NEW CONCRETE MIXTURES TURN WASTE INTO QUALITY ROADS



By utilizing by products of other industries (fly ash and slag) in creating new cement mixtures for local roads and structures, recent cost-benefit analyses indicated a potential material cost savings around \$25,000 per lane-mile when replacing 70% Portland cement with fly ash and slag.

In bid year 2007-2008, 191 lane-miles of concrete pavement were let for construction. Replacement of 70% Portland cement, as is allowed by the new DOTD specifications, with fly ash and slag on that quantity of pavement leads to a material cost savings near \$4.8 million per year. The savings will be much greater when structural concrete numbers are included.

Researchers have found that by mixing "waste materials," such as fly ash and slag, with Portland cement, they can make a comparable (or better) product, all while cutting material costs and reducing pollution for the state.

Current Louisiana specifications allow only a maximum 20% replacement of Portland cement with either fly ash or slag. This research project investigated mixtures incorporating various supplemental cement combinations and their performances. The study indicated that cement mixtures containing up to 70% fly ash and slag exhibited concrete test results that were similar or better than those obtained from control mixtures containing no supplemental cement materials.



EDUCATION & TRAINING

DOTD STRUCTURED TRAINING PROGRAM

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 feels that training is a necessary component and an integral part of career advancement. Structured training can involve professional development, technical skills training, continuing education, and hands-on and on-the-job training. The program manages the work force development for personnel in construction, maintenance, and supervisory/leadership positions. The program also provides liaison assistance to headquarters personnel and district training personnel for policy interpretation and compliance decisions.

Because training is a necessary component of career advancement, 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 the individual working in the transportation industry.

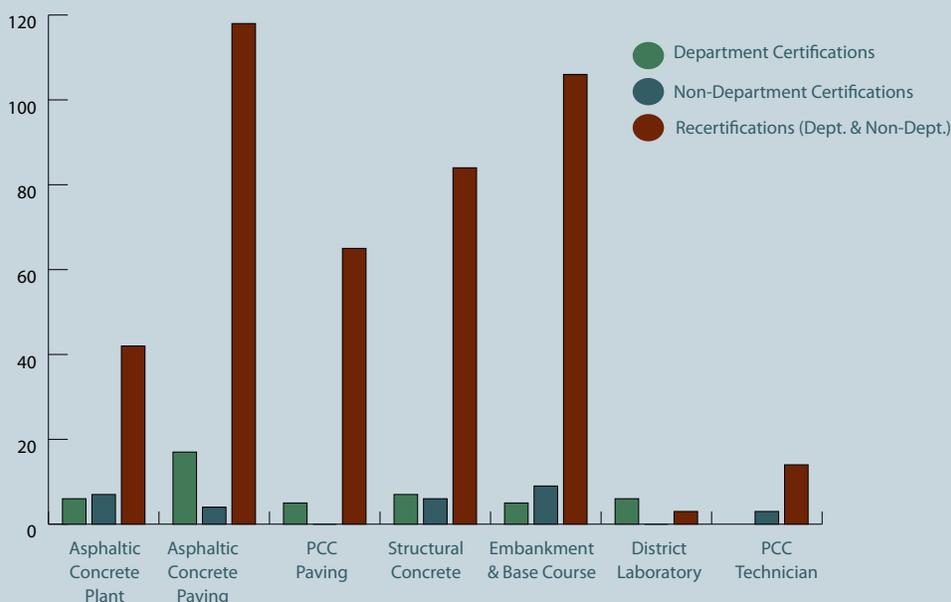
LTRC manages DOTD's Structured Training Programs; develops maintenance and construction training materials and programs; coordinates seminars, workshops, and conferences for continuing education and professional development; and contracts with the private and public sectors for unique training needs.

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 materials and coordinates the training, testing, authorization, certification, and re-certification of inspectors and technicians on a statewide level in each area of construction.

For this fiscal year, the program awarded 75 new construction certifications and processed 432 recertifications.

Certification Actions for FY 11-12 | Dept. and Non-Dept.



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 needed for maximum job performance.

WORKFORCE DEVELOPMENT PROGRAM

This program:

- Serves as liaison to LTRC Transportation Curriculum Council (TCC) as outlined in PPM 47
- Collaborates specifically with district administrators and section heads to support staff development, training and planning.

The LTRC TCC held its first meeting on September 1, 2010. 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 Workforce Development program has the responsibility of helping to schedule and facilitate subcommittee meetings, distribute the meeting minutes to the appropriate people, and provide any support services needed by the subcommittee. It also has the responsibility of scheduling and planning each TCC Committee meeting.

HEADQUARTERS TRAINING PROGRAM

This program assists section heads and designated section training coordinators 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 126 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 51 employees were reviewed and exceptions granted this year.

Testing – Testing sessions are held three times a month for self-study courses. Employees were given 152 tests for different courses this year.

Training – This year classes were conducted to train 139 employees in topics to include: *Basic Flagging, Lockout/Tag Out, Traffic Control through Maintenance Work Areas, ABC's Work Zone Safety, Duties of Personnel Assigned to Movable Bridges*, and various safety topics.

SUPPORT FOR HIGHER EDUCATION

LTRC coordinates the statewide DOTD Engineer Resource Development Program (ERDP), which provides structured rotational training for entry-level engineers. LTRC also manages the Cooperative Education Program for engineering students, a cooperative endeavor between DOTD and universities within Louisiana to employ full-time university students to perform engineering work and receive practical experience in the field of civil and transportation engineering. During 2011-2012, 15 people participated in the ERDP and 27 participated in the Cooperative Education Program. In addition, 45 graduate students were supported through LTRC research projects during 2011-2012.

LTRC also facilitates the DOTD Support Program for Civil Engineering Studies, a cooperative endeavor between DOTD and Louisiana state universities with civil engineering programs. It provides practical experience to civil engineering students who select transportation-related topics among their engineering design courses. DOTD supports this program financially, and universities grant academic credit to its participants. The senior design projects are transportation-related and are included in courses for which junior- or senior-level students receive a grade. At the end of the senior design project, participants provide copies of the final report to LTRC and give a 15-20 minute presentation. Four universities participated in this program during 2011-2012: Louisiana Tech, McNeese, Southern, and University of Louisiana at Lafayette.

MANAGEMENT DEVELOPMENT TRAINING PROGRAM

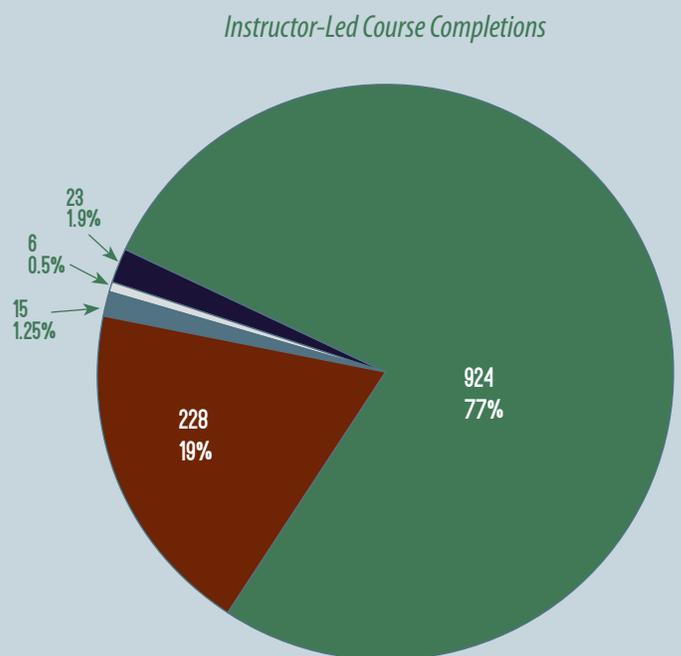
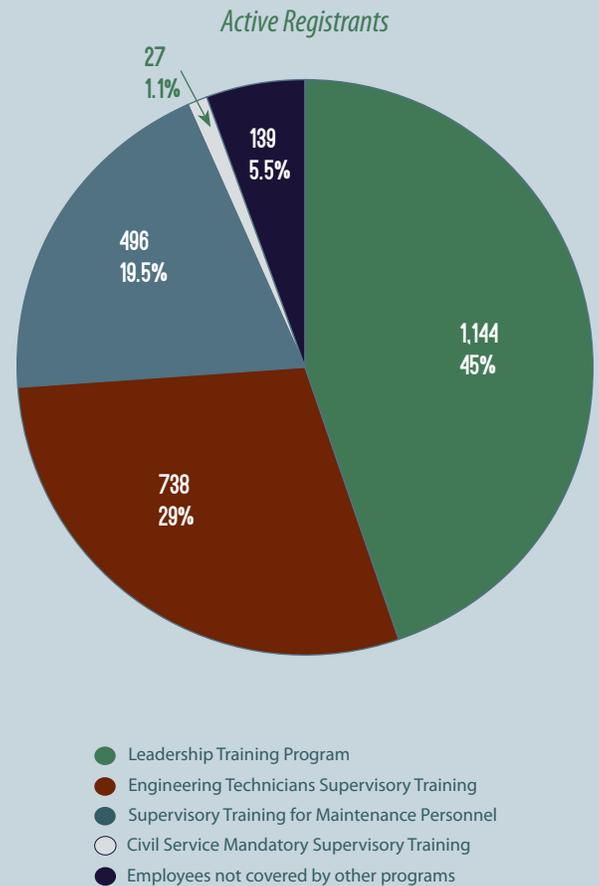
This program oversees several mandatory supervisory, management development, and career development training programs: the Management Development Training program, a structured training program for DOTD employees in a professional job series; the Engineering Technician Supervisory Training program, a supervisory training program for DOTD engineering technicians; the DOTD Supervisory Maintenance Training program for trades, crafts, and maintenance supervisors; and the Civil Service Supervisory training program for supervisors not covered by other DOTD training programs.

Beginning July 1, 2012, with the conversion of all CPTP/Civil Service supervisory training to the LEO/LaGov LSO Training System, all DOTD supervisory was be subscribed to the appropriate Civil Service Supervisory Group (1, 2, or 3) course program for their positions. In addition, employees in professional or engineering technician positions were subscribed to DOTD Management Development course programs in LEO/La-Gov. There are no longer separate DOTD Supervisory Training Programs for maintenance supervisors.

During Fiscal Year 2011-2012, courses for these training programs were delivered through several sources: the Civil Service Comprehensive Public Training Program (CPTP); the DOTD Human Resources Section; the LTRC/DOTD Contract with the LSU Division of Workforce Development; and in-house training courses developed by LTRC.

There were 2544 employees actively participating in the management development training programs in FY 2011-2012.

The number of instructor-led individual course completions for this period of time was 1196. Note that, in November 2011, the Civil Service CPTP Office replaced three instructor-led Supervisory Group 1 classes with web-based training courses. Therefore, from November through June, DOTD employees no longer attended live classes for the CS Group 1 courses. This reduced the number of instructor-led courses scheduled for, and attended by, DOTD employees.



COURSE DEVELOPMENT

Completed Projects

There were 13 courses/projects developed or revised during this time period, 5 in Construction, 3 in Maintenance, and 5 in Core Skills training.

Construction Training

- *Introduction to Pile Driving Inspection* manual
- *Introduction to PCC Paving* Web-Based Course
- *Tack Coat Field Inspection* Manual and PowerPoint
- Highway Plan Reading Volumes 1 and 2 - revision

Maintenance Training

- Equipment Operation: M5035B, Tractor-Mounted Backhoe
- Equipment Operation: M5054B, Track Backhoe
- Review of 31 SOCLs for updating or deletion
- Review of the IRF online portfolio for updating or deletion

Core Skills Training

- Grammar and Writing Skills
- LaGov Training Coordinator Instruction Manual
- LEO/LaGov User Manual
- Implemented new on-line testing system for all self-study manuals
- User Manual for Test.com Proctors and Developers

Current Projects

There are 19 projects current/on-going: 13 in Construction, 2 in Maintenance, and 4 in Core Skills.

Construction Projects

- Revision of *Structural Concrete Inspection Volumes I and II* manuals
- *PCC Paving Inspection* manual and supporting materials
- *PCC Plant Inspection* manual and supporting materials
- *PCC Mix Design* manual and supporting materials
- *Metrics for Engineering Technicians*
- *Context Sensitive Solutions* training materials
- Continued refinement of the HMA training program and HMA Plant Accreditation program.
- Management of the Inspector/Technician Certification Program for DOTD and the Louisiana Transportation Industry
- *Quality Assurance Manual for Asphaltic Concrete* - revision

- *Quality Assurance Manual for Portland Cement Concrete and Structures* - Revision
- *Quality Assurance Manual for Embankment and Base Course* - Revision
- *Introduction to Standard Specifications for Roads and Bridges: 2012 edition*
- Training video for TR 415 -Field Density

Maintenance Projects

- Motor Grader SOCL - revision
- Practical Electricity - revision

Core Skills Projects

- *Planning and Overseeing Budgets*
- *A Guide to DOTD Organization, Functions, and Interrelationships*
- *Basic Business Math*
- Contract Administration Training

PRESENTATIONS/CLASSES

- *Basic Flagging*
- 2 *Traffic Control Through Maintenance Work Areas* classes
- *ABC's Work Zone Safety*
- 3 *Lockout/Tag Out* classes
- 5 *Superpave Mix Design and Analysis* classes
- 1 *Superpave Mix Design and Analysis* classes for Lafayette Consolidated Government
- 1 *Highway Plan Reading Volume I* class
- 1 *Highway Plan Reading Volume II* class
- ETRN to LEO/LaGov Training class for HQ training coordinators





The Transportation Training and Education Center (TTEC) is dedicated to the delivery of transportation training, professional development opportunities, continuing education, and technology transfer to engineers, technicians, and other professionals from Louisiana's public and private sectors. Through this new facility, LTRC is expanding the scope and availability of training, thereby serving a larger population.

TTEC's strategy is to assist and enable workforce development using principles of strategic human capital improvement. The goals of this strategy are to: create and provide sound training, transition current classes/training into the distance learning environment where appropriate, and incorporate instructional design concepts, utilizing the talents of formally trained designers to update and modernize courses.

TRANSPORTATION TRAINING & EDUCATION CENTER

CURRENT & ONGOING PROJECTS

- Cataloging library materials for ease of access, with primary focus on materials published by DOTD and LTRC
- Leadership Development Institute course creation, deployment, and evaluation
 - » Began research & development September 2011
 - » Four pilot classes held
 - » Leadership Development Class One (delivery scheduled in eight districts in August 2012)
 - » Beginning Development of Course Two (Emotional Intelligence)
- TRAC/RIDES Program Implementation
- Managing the Individual Registration Fund
 - » Evaluated submitted requests in order of importance and relevance to the Department
- Providing SIDRA software courses
 - » Course management (i.e., registration, course rosters, course evaluations, vendor correspondence, and room set up).
- Managing the contract with University of New Orleans to provide personal computer training statewide
- Providing Professional Engineer Exam Workshop (services contracted with Test Masters, Inc.)

COMPLETED PROJECTS

- Over 3,000 students attended 210 course offerings at TTEC during fiscal year 11-12.
- Leadership Development Program—Course One (Foundations of Effective Leadership Development)
- LTRC Seminar Series: Congestion Management (September 13, 2011)
 - » Course management (i.e., contract management, registration, course rosters, course evaluations, vendor correspondence, and room set up).
- NTTD Conference- New Orleans, Louisiana (October 9-13, 2011)
 - » Course management (i.e., contract management, registration, course rosters, course evaluations, vendor correspondence, and room set up).

LOCAL TECHNICAL ASSISTANCE PROGRAM

The Louisiana Local Technical Assistance Program (LTAP) is one of 58 centers operating nationally to serve the local and tribal transportation agencies. Throughout 2012, Louisiana LTAP is celebrating 25 years of serving DOTD and Louisiana's local agencies by providing technical training, safety training, technical assistance, and technology transfer. To achieve our objectives, LTAP works in direct partnership and cooperation with our national, state, and local partners to identify needs, develop materials, and implement programs.

Frequently serving as a liaison, LTAP works closely with many of the DOTD offices that interact with local agencies to communicate DOTD policies and information to the local transportation community and to facilitate feedback from the locals. In this role during FY 2011-12, LTAP partnered with new DOTD Director of Local Public Agency Programs, Ann Wills, and with the Louisiana Division of FHWA in the development of a new qualification training program for Local Public Agencies that receive state and federal funds, coordinating these agencies' efforts with the Louisiana Municipal Association and the Police Jury Association of Louisiana. LTAP also worked in partnership with DOTD and FHWA to implement the national Every Day Counts (EDC) initiative designed to promote the use of proven and innovative technologies to speed project delivery and increase efficiency in a variety of areas. LTAP participated on the newly formed State Technology Innovation Council (STIC), which is working on the EDC planning and implementation activities.

LTAP is also a leader in Louisiana local road safety and participates actively in implementation of the Louisiana Strategic Highway Safety Plan, managing over \$10 million in low-cost safety improvements on the state's local road network through the DOTD Local Road Safety Program. A new LTAP focus during the fiscal year was to coordinate with the state's regional safety coalitions to identify local road safety projects address intersection and run-off-road crashes on the local road network around the state. The LTAP staff has conducted detailed analysis of crash data from the local roads, as well as Road Safety Assessments with local agencies to identify opportunities for safety improve-

ments to reduce crashes that cause death and serious injuries.

During 2011-12, LTAP continued to provide low-cost, high-quality training to local public works employees at multiple locations around the state. Two highway safety workshops, "Work Zone Traffic Control and MUTCD Parts 1, 5, and 6" and "Road Safety 365," were attended by nearly 400 participants, and three worker safety classes, "Heavy Equipment Operator Safety," "Chainsaw Safety," and "Public Works Emergency Response Safety," were attended by nearly 800 state and local employees. LTAP also continued to partner with other professional organizations to assist in the planning of their technical conferences, including the Louisiana Chapter of the American Public Works Association and the Louisiana Parish Engineers and Supervisors Association (LPESA). LTAP also conducted multiple sessions of leadership development training for the Deep South Chapter of the Institute for Transportation Engineers, and is actively assisting LPESA in their planning efforts for hosting the Annual Conference of the National Association of County Engineers in Baton Rouge in 2014.



Arbor Master led classroom instruction and field demonstrations at four locations around the state.

The Louisiana LTAP staff members are active in national LTAP activities and are leaders in championing the local road safety efforts at a national level. Dr. Marie Walsh, LTAP director, is the co-chair of the NLTAPA Safety Work Group and also serves in leadership capacities on several AASHTO and TRB committees, as well as the Toward Zero Deaths campaign. She served as a panel member on the NCHRP Project 17-51, Development of a National Strategy on Highway Safety.



As LTRC's formal research program continues to investigate solutions to Louisiana's transportation problems, the technology transfer program serves the wider transportation community by implementing these research findings and technological innovations. Whether through technical assistance on DOTD projects, publications, videos, seminars, or workshops, technology transfer's ultimate goal is to disseminate practical knowledge to municipalities, parishes, and the transportation industry at large.

TECH TRANSFER

SEMINAR SERIES ADDRESSES CONGESTION MANAGEMENT

Transportation officials, state administrators, engineers, planners, and academia alike recently gathered at Baton Rouge's Marriott in September 2011 for LTRC's latest seminar series. "Congestion Management" was a part of the LTRC seminar series, which is designed to be a forum for presenting new technology, discussing concerns, and exchanging information on a focused topic.

The seminar was broken into four different sessions, including *Research and Technology*, *Urban Planning*, *Public Transit*, and *Congestion Mitigation*. Each session held three presentations with speakers from across the state, with a few special presentations from transportation professionals from Florida, New Mexico, and Texas.

University of Florida's Associate Professor of Civil and Coastal Engineering Yafeng Yin presented a topic of interest on "Dynamic Pricing Strategies for High Occupancy/Toll (HOT) Lanes." First implemented in the U.S. in 1995, Yin explained that HOT lanes are managed lanes that allow lower-occupancy vehicles to pay to gain access, but free for high-occupancy vehicles. With only 11 HOT lane facilities in the U.S., Florida first introduced HOT lanes on the 95 Express and opened to traffic on July 11, 2008, and tolling started December 5, 2008, and January 15, 2010, for the northbound and southbound, respectively. The question of concern naturally raised is: What is the right price to charge for these lanes? Yin discussed pricing strategies, current practices, pricing approaches and methods, as well as potential improvements. Yin found in his research that traffic estimates, drivers' willingness-to-pay, and predicting demand of the lanes all are vital roles in finding the best optimal toll during different periods on the day. By gaining all the necessary information, Yin explained, "The transportation industry is making a transition from being 'data poor' to 'data rich.'" And through these estimates, Yin hopes to maximize throughput while ensuring a superior level of service on HOT lanes, incremental change of an optimal toll rate, and equity among users.

Another topic that was particularly informative to Baton Rouge residents was the success of a renovated transit system in Albuquerque, New Mexico. Bruce Rizzieri, the director of the City of Albuquerque Transit Department, presented "Rapid Ride Transit Service to Ease Congestion." Rizzieri explained that a need for better transportation options arose when the city began developing and growing on the west side, while the majority of jobs were found on the east. After much persistence and city support, Rizzieri was able to redesign the "Rapid Ride" transit system. He discussed land use and transportation challenges, projected congestion, and characteristics of the system such as limited stops, signal priority, how the transit ran, size and capacity,



→ Rapid Ride,
Albuquerque, New Mexico

distinctive “stations” with real-time arrival signs, major transit corridors and unique niches it serves, and the extensive marketing it took to get interest high. Results showed that ridership doubled and “Rapid Ride” riders are more likely to have access to a car and option of driving, use their car to park at one of the stations and ride, use the bus to commute to school or work, choose “Rapid Ride” because it’s faster, frequent, and runs all day. Currently the Transit Department is exploring ways to expand on the success “Rapid Ride” has shown, specially finding ways to improve service and land use. Rizzieri explains, “Rapid Ride” has proved very successful. It has been a cost-effective method to establish transit as a serious, viable option for a range of people. We hope in the future to promote development that capitalizes on transit to help address transportation challenges.”

A final presentation of interest to locals in the transportation community was Tim Lomax’s “Urban Mobility Report.” Stationed at the Texas Transportation Institute, Lomax leads a team of researchers and communications specialists who product the Urban Mobility Report, which is an examination of congestion trends in major U.S. cities. Lomax explained that while congestion has grown in cities of all sizes, there are a lot of solutions, but new decisions and processes are needed and we need new data and messages to communicate with the public. He discussed the impact the recession and freight vehicles have on congestions as well as travel delay expansions and shrinking free-flow hours. Lomax also gave figures on congestion trends in Baton Rouge and New Orleans, citing that one location in Baton Rouge falls within the top 20 worst bottlenecks in the U.S. He also went on to explain the many causes of congestion (bottlenecks, traffic incidents, work zones, bad weather, poor signal timing, and special events) and possible solutions (accept some congestion, diversified development patterns, less construction delay, improve system efficiency, build more capacity and commute and travel options). In closing, Lomax discussed long-term strategies in fighting congestion. While solutions will look different with in each region, some possible actions include: aggressively operate what you have, install better processes, service strategically, and share performance reports and targets with the public.

LTRC HOSTS NATIONAL FHWA BROADCAST ON BRIDGE TECHNOLOGY

As part of the Federal Highway Administration’s Every Day Counts (EDC) initiative, transportation engineers, administrators, and professionals gathered at TTEC on Thursday, Feb. 16, 2012, for a nationally broadcast webinar and facilitated discussion, designed to provide opportunities for the exchange of ideas related to specific innovative practices. Subject matter experts from FHWA and DOTD were on hand at each site to share their knowledge of this new technology and to answer participant questions.

The topic of focus was Geosynthetic Reinforced Soil (GRS) Integrated Bridge System (IBS) Technology. GRS-IBS is a form of accelerated bridge construction (ABC) that lowers cost, slashes construction time, improves durability, and increases safety—all at the same time. For transportation agencies whose budgets are insufficient to meet bridge construction demands, GRS-IBS could be the long-awaited answer.



Students learn about GRS-IBS trechnology

GRS-IBS technology uses alternating layers of compacted granular fill material and fabric sheets of geotextile reinforcement to provide support for a bridge. GRS-IBS also provides a smooth transition from the bridge onto the roadway, and alleviates the “bump at the bridge” problem caused by uneven settlement between the bridge and approaching roadway. The technology offers unique advantages in the construction of small bridges, including:

cont. on pg. 23

Visit www.ltrc.lsu.edu/publications.html to download any of our reports, summaries, or capsules.



DISSEMINATION OF INFORMATION

Technology transfer's ultimate goal is to disseminate practical knowledge to municipalities, parishes, and the transportation industry at large. LTRC's Publications and Digital Media Development Program meets DOTD's informational and training needs through newsletters, brochures, annual reports, capsules, Web development, and video production/photography. During 2011-2012, LTRC published 21 technical summaries and final reports, 10 project capsules, and 4 Technology Today newsletters. For a complete listing of publications and presentations by all LTRC personnel, please visit our Web site at www.ltrc.lsu.edu/pdf/11_12publications.pdf.

FINAL REPORTS AND TECHNICAL SUMMARIES

00-2P	490	Implementation of Warranties in State Contracts for Highway Construction
09-2B	485	Development of Surface Friction Guidelines for LADOTD
07-6P	482	Evaluation of Current Louisiana Flexible Pavement Structures Using PMS Data and New Mechanistic-Empirical Pavement Design Guide
07-7P	487	Safety Improvement from Edge Lines on Rural Two-Lane Highways
06-1SS	434	Statewide Traffic Safety Study Phase II: Identification of Major Traffic Safety Problem Areas in Louisiana
05-5GT	471	Evaluation of the Base/Subgrade Soil under Repeated Loading: Phase II—In-Box and ALF Cyclic Plate Load Tests
03-2GT	474	Accelerated Loading Evaluation of Stabilized BCS Layers in Pavement Performance
07-4SS	480	LADOTD Customer Service Process and Outcome Evaluation
95-3GT	427	In-Place Cement Stabilized Base Reconstruction Techniques Final Report: Construction and Eight Year Evaluation
09-4C	486	Evaluation of Ternary Cementitious Combinations
11-2P	489	LADOTD GPS Technology Management Plan
09-1GT	483	Update LADOTD Policy on Pile Driving Vibration Management
07-2C	451	Determination of Coefficient of Thermal Expansion Effects on Louisiana's PCC Pavement Design
09-2C	481	Evaluation of Cement and Fly Ash Treated Recycled Asphalt Pavement and Aggregates for Base Construction
07-1P	452	Finite Element Simulation of Structural Performance on Flexible Pavements with Stabilized Base/Treated Subbase Materials under Accelerated Loading
08-1P	478	Cost Effective Prevention of Reflective Cracking of Composite Pavement
08-1ST	477	Evaluation of Continuity Detail for Precast Prestressed Girders
03-7ST	473	Long-Term Monitoring of the HPC Charenton Canal Bridge
04-5GT	476	Control of Embankment Settlement Field Verification on PCPT Prediction Methods
07-2P	445	Characterization and Development of Truck Load Spectra and Growth Factors for Current and Future Pavement Design Practices in Louisiana
10-1C	479	Evaluation of Surface Resistivity Measurements as an Alternative to the Rapid Chloride Permeability Test for Quality Assurance and Acceptance

PROJECT CAPSULES

12-1ST	Data Collection and Evaluation of Continuity Detail for John James Audubon Bridge #2
12-5P	Evaluation of DOTD Aggregate Friction Rating Table by Field Measurements
11-6GT	Quantifying the Key Factors that Create Road Flooding
12-1P	Assessment of Pavement Distresses Caused by Trees on Rural Highways
12-4P	Development of DARWIN-ME Guidelines for Louisiana Pavement Design
12-2P	Assessment of Environmental, Seasonal, and Regional Variations in Pavement Base and Subgrade Properties
10-4B	Development of Performance Based Specifications for Louisiana Asphalt Mixtures
12-1PF	Traffic and Data Preparation for AASHTO MEPDG Analysis and Designs
11-3P	The Rideability of a Deflected Bridge Approach Slab (LTRC Project 02-2GT Continuation: Phase II)
11-3B	Testing and Analysis of LWT and SCB Properties of Asphaltic Concrete Mixtures

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LTRC HOSTS NATIONAL FHWA BROADCAST ON BRIDGE TECHNOLOGY (CONTINUED)

- Reduced construction time and cost, with costs reduced 25 to 60 percent from conventional construction methods.
- Easy to build with common equipment and materials; easy to maintain because of fewer parts.
- Flexible design that's easily modified in the field for unforeseen site conditions, including utilities, obstructions, existing structures, variable soil conditions, and weather.

About EDC

EDC was launched in 2010 as a way of addressing, with a new sense of urgency, the many challenges faced by today's transportation industry. Among these challenges are the need to work more efficiently (given the state of our nation's economy) and to be more accountable to the public in how we spend their tax dollars. Other challenges faced by today's transportation professionals are to find ways to make our roads safer as well as to help preserve our planet for future generations.

EDC is designed to identify and rapidly deploy innovations aimed at shortening project delivery, enhancing the safety of our roadways, and protecting the environment. This initiative is not about inventing new strategies, but rather discovering existing effective, proven, and market-ready technologies, and facilitating their widespread use at all levels of the transportation industry.

PROFESSIONAL MEMBERSHIPS

TRANSPORTATION RESEARCH BOARD (TRB) COMMITTEES/PANELS

- TRB Technology Transfer Committee (ABC30)
- Committee on Physicochemical Phenomena in Soils (AFP40)
- Committee on Soils and Rock Instrumentation (AFS20)
- Subcommittee on Methods of Analyzing Steel Bridges [a2c02(1)]
- Committee on Non-destructive Evaluation of Structures Subcommittee [AFF40(1)]
- Committee on Concrete Bridges (AFF30)
- Committee on Culverts & Hydraulic Structures (AFF70)
- Committee on Exploration and Classification of Earth Materials (AFP20)
- Committee on Geosynthetics (AFS70)
- Subcommittee on Mechanistic Characterization of Pavement Layers [AFD80(1)]
- Committee on Transportation Earthworks (AFS10)
- Committee on Pavement Management Systems (AFP10)
- Committee on Strength and Deformation Characteristics of Pavement Sections (AFP80)
- Committee on Bituminous Materials Section (AFK00)
- Committee on Characteristics of Bituminous Paving Mixtures to Meet Structural Requirements (AFK50)
- Committee on Pavement Maintenance Committee (AHD20)
- Committee on Soil and Rock Properties (AFP30)
- Committee on Durability of Concrete (AFN30)
- Committee on Basic Research and Emerging Technologies Related to Concrete (AFN10)
- Committee on Properties of Concrete (AFN20)
- Committee on Characteristics of Asphalt Paving Mixtures to Meet Structural Requirements (AFK50)
- Committee on General Issues in Asphalt Technology (AFK10)
- Technical Advisory Council (A0000)
- Special Task Force on Climate Change and Energy (A0020T)
- Research and Technology Coordinating Committee
- NCHRP 20-68A, U.S. Domestic Scan Program
- NCHRP 01-52, Calibrated Mechanistic-Based Methods for Top Down Cracking of Hot Mix Asphalt Layers
- NCHRP 20-85(5), Climate Change and the Highway System Impacts and Adaptation Approaches

- NCHRP 20-89, Intellectual Property Stewardship Guide for Transportation Departments
- NCHRP 20-91, Participation in European Road Association (ERA) ERA-NET Road Research Program
- State Representative Advisory Committee

TRAINING MEMBERSHIPS

- Southeast Task Force on Technician Training and Qualification
- Construction Certification Committee
- DOTD Testing Procedures Committee
- LA Comprehensive Public Training Program (CPTP) Curriculum Committee
- ETRN to LSO Planning Committee
- CPTP Statewide Training Coordinators representative for DOTD
- Civil Service Mandatory Training Coordinators representative for DOTD
- National Transportation Training Directors, President
- American Society for Training and Development
- LATOD - Louisiana Trainers Group
- American Educational Research Association
- United States Distance Learning Association
- National Council on Measurement in Education
- National Defense Industrial Association
- Infocomm (AV trade organization)
- Society of Government Meeting Professionals

LIBRARY MEMBERSHIPS

- NTKN (National Transportation Knowledge Network)
- ETKN (Eastern Transportation Knowledge Network)
- AASHTO-RAC TKN Task Force
- TRB-LIST Committee member
- (SLA) Special Libraries Association, Transportation Division

AMERICAN CONCRETE INSTITUTE (ACI)

- Associate Member, ACI Committee 335, Composite and Hybrid Structures
- Consulting Member, ACI Committee 423, Prestressed Concrete

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

- Soil Properties and Modeling Committee, Geo-Institute, ASCE
- Engineering Geology and Site Characterization Committee, Geo-Institute, ASCE
- Experimental Analysis & Instrumentation
- Structural Wind Effects
- Committee Member of the ASCE Engineering Mechanics Division, Technical Committee on Elasticity
- Committee Member of the ASCE Engineering Mechanics Division, Technical Committee on Properties of Materials
- Reviewers for *ASCE Journal of Hydraulic Engineering*
- American Society of Civil Engineers, Structural Engineering Institute New Orleans Chapter.
- Committee Member, ASCE Bituminous Materials Committee (BMC)
- *Journal of Materials in Civil Engineering*, Associate Editor
- Louisiana Chapter of T&DI

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- Subcommittee D04.20 on Empirical Tests of Bituminous Mixtures
- Subcommittee D04.22 on Effect of Water & Other Elements on Bituminous Coated Aggregates
- Subcommittee D04.24 on Bituminous Surface Treatments
- Subcommittee D04.25 on Analysis of Bituminous Mixtures, Chair
- Subcommittee D04.26 on Fundamental/Mechanistic Tests
- Subcommittee D04.44 on Rheological Tests
- Subcommittee D04.45 on Specifications for Modified Asphalt
- Subcommittee D04.46 on Durability & Distillation Tests

MISCELLANEOUS

- American Society of Mechanical Engineers (ASME)
- ASME Metallic Materials Technical Committee
- Society of Plastics Engineers (SPE)
- American Chemical Society (ACS)
- Society for the Advancement of Materials and Process Engineering (SAMPE)
- International Community for Composite Engineering (ICCE)
- International Institute for FRP in Construction (IIFC)
- United States Universities Council on Geotechnical Engineering Research (USUCGER)
- American Association for Wind Engineering
- American Academy of Mechanics (AAM)
- American Institute of Aeronautics and Astronautics (AIAA)
- American Society for Engineering Education (ASEE)
- Louisiana Engineering Society
- AWWA: American Water Work Association
- WERF: Water Environment Research Foundation
- LSU Communication across the Curriculum – Engineering Advisory Council
- Association of Asphalt Paving Technologist (AAPT)
- Asphalt Pavement Analyzer Users Group Management Committee
- Southeastern Asphalt User Producer Group
- Research Advisory Group of the National Stone, Sand, and Gravel Association
- AASHTO Research Advisory Committee
- AASHTO Standing Committee on Research
- FHWA Technical Working Group on Sustainable Pavements

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