Technology Today

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In this Issue

Upcoming Events

October 25-27
Southeast Transportation Consortium
TTEC

November 4
Transport, Toxicity & Treatability of Transportation Land Use
Rainfall-Runoff Seminar
TTEC

November 17-18
APWA Fall Conference
TTEC

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

Louisiana Leads Pooled-Fund Study: Enhancing Pavement Design Supporting Software for States

In mid-2011, through efforts by the Louisiana Transportation Research Center (LTRC) and Federal Highway Administration (FHWA), the Louisiana Department of Transportation and Development (DOTD), as a leading agency, initiated a state pooled-fund study with eight participating state DOTs and agencies to expand the functions of a software program called Prep-ME, a tool with comprehensive database features to store and process data of traffic, material, climate, etc. that are required by the new pavement design software, DARWin-ME. DARWin-ME provides methodologies for the analysis and performance prediction of different types of flexible and rigid pavements for the specific climatic and traffic conditions.

The Mechanistic Empirical Pavement Design Guide (MEPDG) and the subsequent American Association of State Highway and Transportation Officials (AASHTO) product DARWin-ME are significant advancements in pavement design. However, they are substantially more complex than the 1993 AASHTO Guide, which is currently used in many states. The new systems require significantly more inputs from designers. Among them are many parameters with which today's pavement designers are not familiar, and many data sets need to be pre-processed before their use for MEPDG/DARWin-ME. This process needs to be automated and assisted with software.

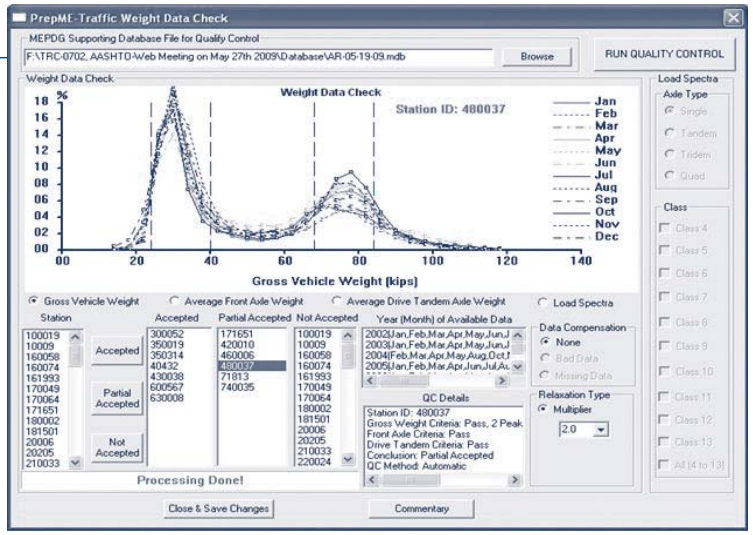
The three-year study, *Traffic and Data Preparation for AASHTO MEPDG Analysis and Design*, is intended to help participating states implement DARWin-ME pavement design software by enhancing the existing Prep-ME software. Prep-ME was initially designed and made to achieve the purpose of data preparation, data quality control, and database development for MEPDG, which is the predecessor of DARWin-ME, with a primary module to qualify truck traffic data from weigh-in-motion (WIM) stations. The first version of Prep-ME was developed for the Arkansas highway department by a research team led by Dr. Kelvin Wang and Dr. Kevin Hall at the University of Arkansas.

It is envisioned that through this pooled-fund study, a possible nationwide platform for the data preparation of DARWin-ME can be established with guidelines and supports provided to individual states for implementation. It is anticipated that more state and private agencies will join the study throughout the course of the three-year period. Currently, the contributing agencies include DOTD, FHWA, and state DOTs of Hawaii, Kentucky, Maryland, North Carolina, New Hampshire, and Wisconsin with each state contributing $50,000 for the three years.

The primary final product of the proposed research is the Prep-ME software version 2.0, a central database suitable for use with DARWin-ME and documentation. This research will also provide roadway designers insight into the criticality of specific inputs required in the new pavement design guide, including key truck traffic characteristics. In addition, the participating highway

agencies can use the new version of Prep-ME by WIM field data crews to check traffic data quality of WIM equipment in the field.

With the Prep-ME software version 2.0, researchers expect to improve the speed of executing the most time consuming tasks, including raw traffic data importing/updating and user's data interpolation functions; add more features based on a consensus basis of participating states, including the algorithms and their implementations of quality control of WIM truck traffic data; improve user friendliness/usability; conduct stability and testing of Prep-ME; and carry out training of the software.



Main screen shot of traffic weight data check in Prep-ME

A critical task for the success of the pooled-fund study is to adopt the best quality control algorithms and their implementations for truck traffic data from WIM stations in state DOTs. An expert group has been formed and is led by the North Carolina DOT to advise and guide the implementation of the truck traffic data analysis and quality control. A substantial effort in the study includes the development of database capabilities in Prep-ME that are compatible with the requirement of individual states with respect to data preparation and input for the implement of DARWin-ME.

Overall, researchers hope the new version of the Prep-ME software will assist participating state DOTs in data preparation and improving the management and workflow of the DARWin-ME input data to make the DARWin-ME software more accessible and easier to use across the nation.

For questions or more information on the pooled-fund study, please contact LTRC Director Harold Paul at (225) 767-9131 or harold.paul@la.gov or Pavement and Geotechnical Research Administrator Zhongjie "Doc" Zhang at (225) 767-9162 or doc.zhang@la.gov.

Over 180 transportation officials, state administrators, engineers, planners, and academia alike recently gathered at Baton Rouge's Marriott on Tuesday, Sept. 13, 2011, for LTRC's latest seminar series.

Seminar Series Begins with Congestion Management

The all-day seminar, entitled *Congestion Management*, was a part of LTRC's 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 are 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 are vital roles in finding the best optimal toll during different periods of 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 found particularly informative to Baton Rouge residents was seeing 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 Albuquerque transit system by creating "Rapid Ride" buses. He discussed the system's 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, 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, and 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, specifically 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 particularly 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 produce 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 congestion 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.

To download presentations from the seminar, please visit http://www.ltrc.lsu.edu/conferences.html. If you have questions concerning the seminar, please contact Associate Director of Research Mark Morvant at (225) 767-9124 or mark.morvant@la.gov.

LTRC Congratulates Recent Retirees

LTRC would like to applaud three of its hardest working and long-time employees on their retirements from the center this past summer. Tinka McFarland, Randy Young, and David McFarland collectively contributed to the technology transfer and training and research departments and their involvement will be greatly missed. LTRC would like to thank these individuals for their dedicated service to the Department and wish them well in future endeavors.

Tinka McFarland

Tinka McFarland began working for the state as an illustrator in the training office of an agency known then as the Louisiana Department of Highways. Transitioning from illustrating to technical writing, she became involved in training course development and served as the training and development program manager for the Department's maintenance training program, overseeing the development and implementation of training materials for approximately 150 job classifications. Most recently, McFarland has led LTRC's Structured Training Programs and was responsible for five major training programs held at the center

Over the years, McFarland participated in many major DOTD efforts. She oversaw DOTD's Workforce Development Policy, PPM 59, which established the Department's workforce philosophy. She also served as a lead member of a committee that won DOTD's Team of the Year award in 2002 for revising the Structured Training Program for DOTD's Engineering Technician series. Out-dated training requirements were revised, and 45 new job-specific training programs were put in place. However, the accomplishment of which she is most proud was the conception, implementation, and management of the Rebuilding Opportunities and Development (ROAD) Program, a literacy skills upgrade program allowing work release time for employees to learn to read or work toward a GED. DOTD had more than 90 employees who received their GED during the eight years the program was in place. DOTD was the first state agency with such a program.

In 2009, after 40 years of service to DOTD, McFarland was named a recipient of the highly esteemed Charles E. Dunbar, Jr. Award, the highest honor classified state employees can receive for their service to the citizens of Louisiana. The Civil Service League bestows the award on local, state, and municipal civic service employees who distinguish themselves through unselfish service, contributions toward workplace improvement, personal initiative, and volunteer community service.

Randy Young

Randy Young served the Department in the Concrete Lab from his first day of work on January 3, 1978, until his retirement in 2011.

Young was always very helpful and cooperative and came to work every day with a positive attitude. He was quick to volunteer when needed, especially for the building maintenance and safety coordinator. Throughout his years of service, Young was always ready to help Department personnel, professors, and contractors upon request. Young organized the first CCRL accreditation for the Concrete Lab. He was a member of the following professional organizations while at LTRC: American Concrete Institute, Louisiana Chapter; Portland Cement Association; American Society of Testing and Materials; American Association of State Highway Transportation Officials; Secretaries Association of State Highway Transportation Officials; and an honorary lifetime member of the American Society of Civil Engineers, LSU student chapter.

David McFarland

After moving to Louisiana in 1985, David McFarland began working for DOTD as a senior electrician. His background as a certified emergency medical technician prepared him to join the Department's safety section teaching CPR and first aid the following year. During this time, DOTD's safety and training sections were restructuring and merging. McFarland became a safety specialist and then a supervisor in the new section.

In 1993, he joined the Local Technical Assistance Program as a teaching associate. McFarland has completed American Traffic Safety Services Association classes on Work Zone Supervision and Work Zone Design and is certified by the International Municipal Signal Association, Signs and Marking Level 1 & 2. He became well known across the state as LTAP's on-the-go trainer, teaching works zone safety classes and flagger workshops as part of the Local Road Safety Program.

LPESA Conference Convenes in Lafayette

On Thursday, Sept. 8, 2011, over 90 participants gathered at the Ramada Inn of Lafayette to participate in the Louisiana Parish Engineers and Supervisors Association (LPESA) fall conference. The conference was held in cooperation with the Federal Highway Administration, Louisiana Department of Transportation, Louisiana Transportation Research Center, and associate members of LPESA. The theme for this conference was *Asphalt Pavement Maintenance in Louisiana*.

The conference was opened by Elton Pickering, LPESA president, who introduced Lafayette Mayor Joey Durel. Mayor Durel thanked the association for selecting Lafayette to hold the fall conference and spoke about new and upcoming projects Lafayette has planned for roadway maintenance.

The LPESA scholarship was also presented during the opening of the conference. The LPESA scholarship is awarded annually to one civil engineering student attending either LSU, University of Louisiana-Lafayette, Louisiana Tech, or McNeese State. This year's recipient was Kourtney Hoffpauir, a senior at McNeese State University. Hoffpauir is a member of the American Society of Civil Engineers, the Louisiana Engineering Society, and the Society of Women Engineers.

The conference continued with an update on the 2014 National Association of County Engineers Conference (NACE) from Iowa NACE representative, Tom Stoner. The 2014 NACE conference is in preliminary planning to be held in Louisiana. Stoner also highlighted the new NACE Web site and presented examples of legislative priorities sponsored by NACE.

Morning presentations continued with "The Why and How of Pavement Preservation" given by DOTD's Mark Chenevert and "Warm Mix Asphalt – Lessons from the Field," given by Kent Langley of Coastal Bridge Construction. Participants then went outside for a parking lot demonstration on the Dura Patcher, a permanent pothole solution. Representatives from Duraco Industries were on hand to explain capabilities of the machines and give a comprehensive overview of how it works.

Scott Reed, transportation safety manager of Wal-Mart, wrapped up the morning meeting with a safety presentation on 18-wheeler transportation by Wal-Mart. Scott was on hand with two local 18-wheeler drivers for Wal-Mart to describe safety precautions they take inside and outside their trucks. Wal-Mart's transportation safety department travels to local schools, municipalities, and other organizations in order to raise awareness of 18-wheeler safety. Where space permits, they will bring an 18-wheeler to give a hands-on demonstration of their safety efforts.

Afternoon sessions continued with Tom Phelps of Crafco speaking on joint and crack sealing and DOTD's Jason Davis speaking about cold mix asphalt and its success in pavement distress and filling potholes.

LTRC Asphalt Research Manager Bill King continued the afternoon discussion on thin lift asphalt. King explained that anything less than 1 ½ inch should be considered a thin lift. King spoke about research performed on open graded friction course (OGFC) and new specifications written as a result of this

research. As a result of the new specifications, fatalities have dropped on Louisiana highways for the third year straight. Research indicates that this is also a national trend on highways, bridges, and all aspects of vehicular safety.

The conference concluded with Wesley Danna from DOTD presenting on "Shoulder Wedge/Safety Wedge" and Dean Tekell speaking about "Road Safety Opportunities during Pavement Presentation Activities." A question and answer session was also held and open to all presenters.

LTAP Teaching Associate David McFarland was also honored during the fall conference for his service and dedication to the Louisiana Parish Engineers and Supervisors Association. McFarland retired from LTAP in September with 25 years of service.

For more information on the Louisiana Parish Engineers and Supervisors Association fall conference, please contact Bob Breaux at (225) 767-9117 or bbreaux@ltrc.lsu.edu. The LPESA associate members would like to extend special thanks to Diamond B Construction and Ergon for hosting the welcome reception Wednesday evening.

Staff Updates and Accomplishments

Chester Wilmot, Ph.D., professor in civil and environmental engineering at LSU, was recently awarded the "Outstanding Civil Engineering Educator Award" from the Baton Rouge branch of the American Society of Civil Engineers (ASCE). Dr. Wilmot received this award at the branch's annual Past Presidents and Awards luncheon in June. Dr. Wilmot joined the CEE department in 1993 and has been a member of the ASCE since 1995.

LTRC Research Accelerated Pavement Research Program Manager **Zhong Wu,** Ph.D., P.E., has recently been selected to serve as a panel member on the National Cooperative Highway Research Program (NCHRP) Project 01-52: "Calibrated Mechanistic-Based Models for Top-Down Cracking of Hot-Mix Asphalt Layers."

Associate Director of External Programs, **Vijaya (VJ) Gopu,** Ph.D., P.E., served on the NSF site visit teams that reviewed the NEES Equipment Sites Oregon State University in April 2011 and University of California – Davis in May 2011 and the NEES Headquarters at Purdue University in August 2011. Dr. Gopu presented a paper titled "Should Engineers Design Homes to be Tornado Proof?" at the Louisiana Civil Engineering Conference in September 2011.

On May 18, 2011, **Willie Gueho** was promoted to engineer technician 6 DCL in the Asphalt Materials Research Lab. Gueho will serve as the resident expert in the area of testing asphaltic concrete materials. He takes over the position vacated by Greg Tullier, who recently moved to the Concrete Materials Research Lab.

Patrick Frazier was promoted to engineer technician 5 in the Asphalt Materials Research Lab in September 2011. Frazier takes over the position vacated by Willie Gueho. In addition to his materials testing duties, Frazier has agreed to take over as the building maintenance and safety contact person for LTRC due to the retirement of Randy Young.

Asphalt Research Manager **William "Bill" King**, Jr., P.E. and Asphalt Research Engineer **Md. Sharear Kabir**, E.I. along with Louisiana's FHWA representative, Joe Bloise, were recently selected to represent DOTD at the Southern States In-Place Recycling Conference held in Atlanta, Georgia on August 30 through September 1, 2011. Kabir and Bloise gave a presentation entitled "Louisiana's Experience with In-Place Recycling." King also recently gave a presentation at the Louisiana Civil Engineers Conference and Show in New Orleans on September 22, 2011, entitled "New Specifications for Asphaltic Concrete."

LTRC congratulates **Tyson Rupnow**, Ph.D., P.E., on his promotion from concrete research engineer to concrete research manager effective August 8, 2011.

Recently Published

Project Capsule 10-4SS
Truck Facility Access Design Guidelines Statewide
Thomas R. Swanson, P.E., PTOE, and Robert E. Boagni, P.E.

Project Capsule 10-4ST
Development of Wave and Surge Atlases for the Design and Protection of Coastal Bridges in South Louisiana
D. Max Sheppard, President, Ph.D., P.E.

Project Capsule 11-1P
LADOTD Pavement Management System (PMS) for Project Level Applications
Margot Yapp, P.E.

Project Capsule 11-2SS
Measuring Effectiveness of Ramp Metering Strategies on I-12
Sherif Ishak, Ph.D.

Project Capsule 11-3B
Testing and Analysis of LWT and SCB Properties of Asphaltic Concrete Mixtures
William "Bill" King, P.E., and Md Sharear Kabir, E.I.

Project Capsule 11-3P
The Rideability of a Deflected Bridge Approach Slab (LTRC Project 02-2GT Continuation: Phase II)
Mark Martinez, P.E.

Final Report and Technical Summary 445
Characterization and Development of Truck Load Spectra and Growth Factors for Current and Future Pavement Design Practices in Louisiana
Sherif Ishak, Ph.D., Hak-Chul Shin, Ph.D., and Bharath Sridhar

Final Report and Technical Summary 473
Long-Term Monitoring of the HPC Charenton Canal Bridge
Walid R. Alaywan, Ph.D., P.E.

Final Report and Technical Summary 476
Control of Embankment Settlement Field Verification on PCPT Prediction Methods
Murad Abu-Farsakh, Ph.D., P.E, Xinbao Yu, Ph.D., and Gavin Gautreau, P.E.

Final Report and Technical Summary 477
Evaluation of Continuity Detail for Precast Prestressed Girders
Ayman M. Okeil, Ph.D., P.E., Steve Cai, Ph.D., P.E., Veeravenkata Chebole, and Tanvir Hossain, M.S.

Final Report and Technical Summary 479
Evaluation of Surface Resistivity Measurements as an Alternative to the Rapid Chloride Permeability Test for Quality Assurance and Acceptance
Tyson Rupnow, Ph.D., P.E., and Patrick Icenogle, E.I.

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