

# Technology

# Today

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## LADOTD Secretary Assumes Research

Dr. Kam Movassaghi was recently appointed to leadership roles on two major research committees. He will be a member of the Transportation Research Board (TRB) Executive Committee while also serving as Chairman of AASHTO's Standing Committee on Research (SCOR). "I've been given a very unique opportunity to serve in both areas. The

committees are on different ends of the spectrum, and that makes for very interesting work," said Movassaghi.

The TRB Executive Committee is composed of about 25 individuals from government, industry, and academia who are active in TRB's interest area, and a variable number of ex-officio members. The committee is charged with determining and directing the

## Leadership Roles

policies and activities of TRB. Members are appointed with the approval of the National Research Council.

AASHTO's SCOR is responsible for staying informed of all transportation research programs in the U.S. and evaluating them from the perspective of known research needs. The committee also solicits

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## Students Discover LADOTD Career Opportunities



LTU students listen to LADOTD presentations

This past winter, over 20 civil engineering students from Louisiana Tech University (LTU) visited LTRC as a part of the LADOTD Support Program for Senior Projects in Civil Engineering. Each year civil engineering departments from seven state universi-

ties can qualify for a \$5,000 grant from LADOTD for the completion of a transportation-related senior project. Along with their chosen project, LTU also used a portion of the funding for the trip so that students could

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## LADOTD Secretary (cont. from page 1)

research problem area proposals from member departments and monitors the research programs conducted through TRB, including the National Cooperative Highway Research Program (NCHRP). AASHTO president James Codell (Kentucky Transportation Cabinet Secretary) appointed Movassaghi, who is replacing Dwight Bowers (Idaho Transportation Department Secretary).

Movassaghi attended his first TRB Executive Committee meeting in January. "It was a very interesting experience learning to understand the dynamics, players, objectives, and philosophies of the organization," he said. "The majority of committee time is spent on high-level, embryonic issues. Various presentations by experts generated interesting debates."

The Executive Committee focuses on the direction of the nation's transportation infrastructure in the next 20 years. Movassaghi sees security, safety, and funding as key research areas for

our country in the next decade. A more specific issue for the Gulf Coast Region involves trade with Latin America. According to Movassaghi, "We have a tremendous opportunity with regard to trade with Latin America as their economies grow. It will place a load on our infrastructure, and we need to start preparing ourselves."

While the TRB Executive Committee deals with incipient ideas, SCOR focuses on specific research topics that are important to multiple states. "Without SCOR, we would not be where we are today. NCHRP money is well spent. Without it, we would not be able to afford the research," Movassaghi affirmed.

Because of his experience in academia, these new research positions are not unfamiliar to Movassaghi. "I am fortunate in that my professional career has spanned industry, academia, and now, public service," he said. "I'm pleased

and honored. It will require a lot of work, but it's the kind of work I enjoy. I look forward to the challenge."

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## Awards & Accomplishments

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The **Engineering Technician Task Force** was awarded the DOTD Headquarters Team of the Year Award for 2002. This task force began its work with an engineering technician job study and efforts were completed with the implementation of the Secretary's Policy and Procedure Memorandum No. 59, which represents the comprehensive Work Force Development Policy. Team members included:

**LTRC:** Tinka McFarland, Allison Landry, Dee Jones (retired)

**DOTD:** Barbara Ingraham, Buddy Porta, Steve Cumbaa, Steve Perault, Raymond Scallan, Freddie Gardner, Francisco Gudiel, Joe Bond, Leslie Mix

**David Grouchy** (LTAP Director) delivered two presentations on Successful Supervision and Conflict Resolution to the International Geotextile Conference in Atlanta, GA, and was the keynote speaker at the Technology & Innovation Funding Program Conference to be held by the Federal Highway Administration in Vancouver, WA, on May 12-15, 2003.

**Dr. Zhongjie "Doc" Zhang** (LTRC Senior Geotechnical Research Engineer) and Dr. Mehmet T. Tumay (Associate Dean, LSU College of Engineering) authored a paper in a newly available national publication. "Non-Traditional Approaches in Soil Classification Derived from the Cone Penetration Test (CPT)" appears in the American Society of Civil Engineers (ASCE) Geotechnical Special Publication No. 121: Probabilistic Site Characterization at the National Geotechnical Experimentation Sites, edited by Erik VanMarcke and Gordon A. Fenton (2003). This book was selected as the "Book of the Week" in a recent ASCE e-newsletter.

A paper based on LTRC-sponsored research will be presented at the Second International Structural Engineering and Construction Conference (ISEC 02), which will be held September 23-26, 2003, in Rome, Italy. **Dr. Aziz Saber** (Louisiana Tech University) is the principal investigator and author of the paper titled "Continuity Diaphragms in Continuous Span Concrete Bridges with AASHTO Type II Girders" (State Project # 736-99-0914; LTRC Project # 01-1ST).

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## New Software Tool to Aid Agencies in Outsourcing Decision Making



**Principal investigator Chester Wilmot discusses ODAM features with district administrators.**

**Donald R. Deis, Ph.D.; Rong Xu, Ph.D. candidate; and Edward Watson, Ph.D. of LSU were co-principal investigators in this research and the creation of ODAM.**

The research report “Designing a Comprehensive Model to Evaluate Outsourcing of LA DOTD Functions and Activities” has been published, but now, according to principal investigator Chester Wilmot, Ph.D., it’s time to answer the question, “Is this useful?”

To begin the implementation process, Wilmot presented the Outsourcing Decision Assistance Model (ODAM) software tool to LADOTD district administrators at their annual meeting at headquarters. Attendees received a copy of the PC-based ODAM on CD as well as a complementary user manual. Wilmot then pre-

sented a brief background of the study, guided administrators through the installation process, and demonstrated the program’s various assessment processes.

ODAM is the end product of a project that sought to develop a systematic, comprehensive approach to evaluate the potential to outsource LADOTD functions and activities. It takes into account both cost and non-cost factors by running two models—qualitative and cost.

In the qualitative model, developed from a review of models used in other states and extensive interviews with LADOTD personnel,

users can subjectively assign weights to relevant perspectives for the project in question. The six possible qualitative perspectives are customer, internal business, innovation and control, financial, employee, and contractor market.

Users can estimate outsourcing and insourcing costs in the cost model by working through a series of tables with information prompts. ODAM can then compare estimated outsourcing costs to two versions of estimated in-house costs—direct in-house costs and full in-house costs, which include noncontrollable costs. ODAM users can also maintain civil service wage rates, payroll additive rates, and support services rates at current levels.

The final result of the computer model is a graphical representation of the results of both models on a scale with three sections: (1) insourcing recommended, (2) outsourcing recommended, and (3) indeterminate. However, these results must be considered as an aid to decision making, not

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a prescription of what must be done.

Version 1 of ODAM was pilot-tested on three LADOTD functions: rest area maintenance, highway striping, and highway pavement markers. Results of the pilot test for Version 1 provided modifications for the current Version 2, with the intent of Version 2 being used to evaluate functions currently being considered for outsourcing.

Wilmot has presented ODAM to six other state agencies. Because of its generic design, other agencies can adapt ODAM to fit their needs by adjusting the cost rates unique to their organizations. Douglas B. McDonald (Secretary of Transportation, Washington State Department of Transportation) and Pekka Pakkala (Finnish Road Administration) have requested copies of the software for review.

District administrators will be the primary testers for

Version 2 of ODAM. As their comments and suggestions come in from this trial period, consideration will be given to extending ODAM applications to the internet for group interaction.

Robert Roth, District 62 Administrator, believes ODAM will be helpful, particularly in the cost evaluation perspective. "This program automates what has been done by hand in the past, and eliminates the possibility to overlook certain aspects," he said.

## Students (cont. from page 1)



**LTRC's Bill King provides a tour of the Pavement Research Facility for the LTU students.**

learn more about career opportunities at LADOTD.

LTRC's Mike Boudreaux, the students' host for the day, is the supervisor of the

LADOTD Engineering Resources Development Program. Two LTU students who made the trip last year are now participating in this 30-week-long rotational program that allows new employees to spend time in several different LADOTD areas. "By participating in the rotation, new engineering employees can gain experience in different areas before making a final decision," says Boudreaux.

Representatives from Road Design, Bridge Design, LTRC, Highway Safety, Traffic Engineering, and Planning presented a brief overview of their areas and fielded questions from the students. After a tour of LTRC lab facilities, the group departed for a tour of the Pavement Research Facility. Drs. Norm Pumphrey and Freddy Roberts, an LTRC Policy Committee member, accompanied the students.

## Researchers Investigating Alternative Methods to Trench Backfill

Zhongjie “Doc” Zhang, Ph.D., P.E., is the principal investigator. Murad Abufarsakh, Ph.D., P.E., and Lam Wang, Ph.D., P.E., are co-principal investigators. The LTRC geotechnical lab and crews from Districts 03, 08, 61, and 62 provided valuable assistance in this project.

Conduit structures such as pipes and culverts are commonly used for dealing with hydraulic drainage on highways. Although LADOTD has standard specifications for furnishing, installing, and maintaining these conduit structures to guarantee their proper function, unexpected settlement still occurs at some cross drains under highway pavements.

(asphalt, portland cement), and trench width. Trench backfill has the potential for settlement when it does not get sufficient compaction, which creates a weak zone within the pavement subgrade soil. When subjected to heavy construction and traffic loading, the weak zone will have a differential settlement against the adjacent subgrade soils.

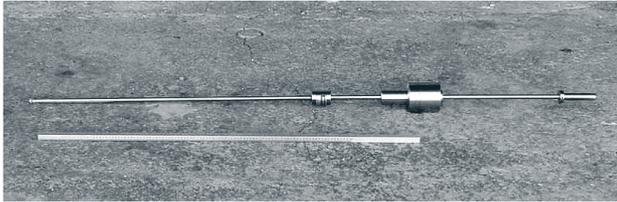
tions that preserve pavement ride quality. However, LTRC’s current research may produce recommendations for use of certain backfill materials or construction techniques when specific site conditions are encountered.

Researchers have completed Dynamic Cone Penetration (DCP) tests at nearly 20 trench backfill locations with and without settlement problems in Districts 03, 08, 61, and 62. DCP is a simple test that provides continuous measurements of in-situ strength of subgrade soils without excavating the existing pavement. The testing team cored through existing pavement structures using a drill rig and started the DCP at the top of the subgrade soils. During the test, the 20 mm (3/4”) diameter cylindrical cone penetrates from the surface of subgrade soils down to the required depth. The penetration depth for each hammer blow is recorded; this is defined as the penetration rate (PR, in cm/blow). Then a blow count per 10 cm (4”)



Trench backfill settlement is generally controlled by various factors, including the relative strength and stiffness of backfill materials with respect to adjacent native subgrade soils, traffic loading, thickness of backfill cover, pavement type

These settlements cause the deterioration of pavement ride comfort by forming “dips” at the pavement surface. This phenomenon indicates that, under certain conditions, the current specifications cannot guarantee cross drain installa-



### **Dynamic Cone Penetration (DCP) Device**

penetration is calculated from the PR. Teams conducted these tests both within and out of trench backfill areas for comparison.

DCP profiles at cross-drain pipes with pavement settlement problems show that the blow counts per 10 cm (4") penetration in the trench backfill are less than the values out of the trenches. Under the same traffic loading conditions, the blow counts per 10 cm (4") penetration at cross-drain pipes without pavement settlement are almost the same within and out of trench backfill. These results support the belief that pavement "dip" will occur at cross-drain locations when the backfill material is much weaker than the adjacent subgrade soils. Therefore, pavement "dips" at cross-drain pipe locations can

only be prevented if trench backfill is at least as strong or stronger than the adjacent subgrade soils.

Test results indicate that both native subgrade soils and sand backfill have a wide spectrum of variation in the penetration blow count. While this variation is normal for native subgrade soils since they are the results of a natural process, it is abnormal for sand backfill as it was built under the same construction specification. In many cases, sand backfill is weaker or much weaker than the native subgrade soils; therefore, current construction practices should be modified by either changing specifications or tightening quality control.

LADOTD maintenance crews have used other backfill materials including recycled asphalt pavement (RAP), Mexican limestone, and gravel. Further testing work is needed for these materials. Researchers also conducted DCP tests at locations with flowable fill

and found that it is much stronger as backfill than the adjacent subgrade soils and cannot be penetrated by the DCP device.

In the next stages of research, trench backfill testing sections will be used to check the suitability of different materials as backfill (sand, select soil with PI, RAP, crushed stone) and explore different means of quality control. Researchers will select these testing sections with the aid of LADOTD construction experts. The fundamental purpose of the testing sections is to find results that LADOTD can implement in daily construction activities, thereby preserving pavement ride quality for consumers.

## Teaching and Learning Certificate Recipients Honored

CPTP was established by Act 656 of the 1979 Legislature to upgrade professional, technical, and managerial skills of state employees and non-elected officials in Louisiana. LTRC manages the program for LADOTD.

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Twenty-seven LTRC and LADOTD employees recently received Certificates in Teaching and Learning at the 2003 Awards Ceremony for Comprehensive Public Training Program (CPTP) graduates. LTRC and LADOTD graduates were the largest group receiving certificates.

The CPTP Management Development Program has been redesigned to offer employees the opportunity to earn certification in concentrated areas of study: Building Effective Teams, Managing People, Managing Work, and Advanced Managerial Skills. The Certificate in Supervisory Techniques, which will be phased out June 30, 2003, is awarded to participants who have completed the first three levels of management training plus tests, work-related projects, and other requirements. Three LADOTD employees received the Certificate in Supervisory Techniques: Terri Hammack, Randall Paisant, and D.J. Webre, Jr.

The Human Resource Development certification program, a joint effort of the

CPTP and the state agency undersecretaries in the Foster administration, began in 2000 with a pilot course that included 32 days of classes along with two exams and a practical application project. LTRC employees Tinka McFarland, Dedra Jones (retired), and Wilma Chustz received certificates with the pilot class.

After modification, the HRD certificate curriculum now includes two certification tracts: the Teaching and Learning Certificate and the Certificate in Human Resource Development. The Teaching and Learning Certificate has 16 days of classes, exams, and a practical application project. Both certifications have been specially designed to meet the professional development needs of trainers currently working in state government. The program was created by Drs. Sharon Naquin and Ed Holton of the LSU School of Human Resource Education and Workforce Development.

As a graduate of the HRD certification program, Tinka McFarland says, "In addition to important experiential

learning exercises, the training provided valuable reference materials for future use in all aspects of human resource development, from analyzing performance problems to group facilitation to training design and delivery. It has also aided participants in forming a professional training community for idea sharing and problem solving."

The following LTRC and LADOTD personnel received the Certificate in Teaching and Learning:

### LTRC

**Karen Cordell, Sher Creel, Gary Hidalgo, David McFarland (LTAP), Sandra Romero, Cindy Twiner**

### LADOTD

**Reggie Ballard (08), Joe Bond (61), Frank Ciolino (62), Alfred Cyprian (62), Brad Dill (08), Randy Dyson (61), Kevin George (07), Todd Kidder (03), Bill Laird (07), Suzie Langley (07), Marvin Leleux (03), Scott Leonard (CCC), Glenn Linder (58), Wayne Monfrey (02), Ranzy Montet (16), Amy O'Neal (05), Diane Rome (02), Terry Shaver (04), Steve Smith (04), Fred Stentz (02), and Joe Stroud (58).**