

TEXAS TRANSPORTATION

Researcher

A PUBLICATION OF THE TEXAS TRANSPORTATION INSTITUTE ■ MEMBER OF THE TEXAS A&M UNIVERSITY SYSTEM ■ VOL. 42 ■ NO. 3 ■ 2006

Leadership and service *for more than a decade*

Richardson retires from TTI



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cracking***
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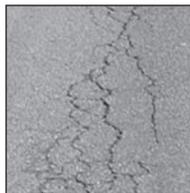


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ON THE COVER: Herb Richardson, TTI Director for over a decade, is retiring at the end of October. Under his leadership, four new national centers of excellence were won and in 2003, the Texas Legislature established TTI's Center for Transportation Safety.



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Researcher

A PUBLICATION OF THE
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and MEMBER OF
THE TEXAS A&M UNIVERSITY SYSTEM

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Texas Transportation Researcher is published by the Texas Transportation Institute to inform readers about its research, professional and service activities. Opinions expressed in this publication by the editors/writers or the mention of brand names does not necessarily imply endorsement by the Texas Transportation Institute or The Texas A&M University System Board of Regents.

Texas Transportation Researcher (ISSN 00404748) is a quarterly publication of TTI Communications, Texas Transportation Institute, The Texas A&M University System, 3135 TAMU, College Station, Texas 77843-3135. For more information or to be added to the mailing list, contact the address below, call (979) 458-8834 or e-mail Nancy Pippin at n-pippin@ttimail.tamu.edu. Periodicals postage paid at College Station.

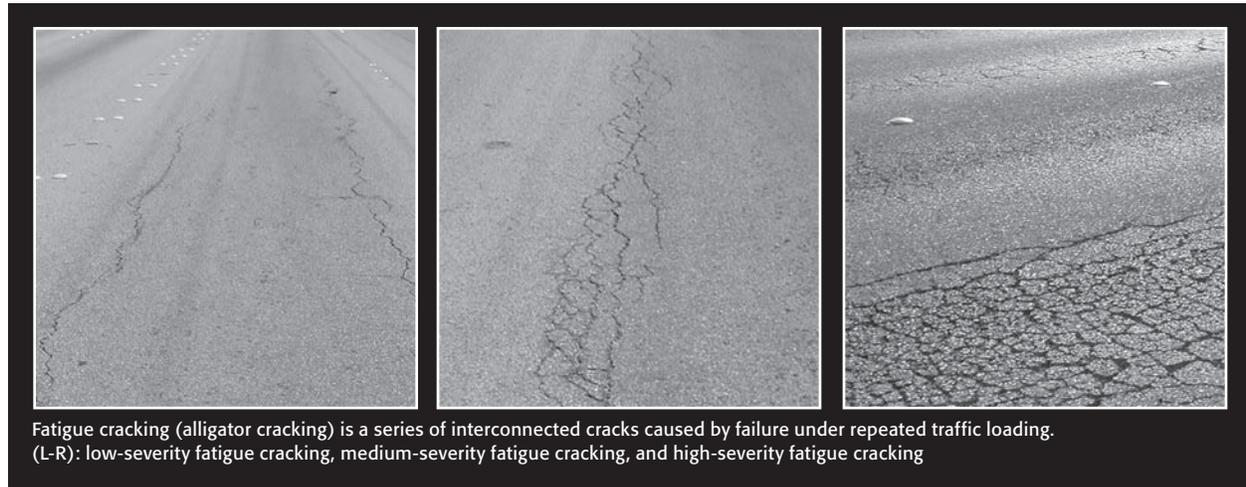
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Combating pavement cracking

Research aimed at reducing long-term fatigue problems



Fatigue cracking (alligator cracking) is a series of interconnected cracks caused by failure under repeated traffic loading. (L-R): low-severity fatigue cracking, medium-severity fatigue cracking, and high-severity fatigue cracking

A high-quality asphalt pavement is something a lot of motorists probably take for granted. That is, until they venture onto a rough stretch of road and have to contend with increased noise and vibration. Recent research efforts at the Texas Transportation Institute (TTI) are aimed at keeping the roads comfortable for the public by maximizing the long-term performance of hot mix asphalt (HMA).

For the past decade, the Texas Department of Transportation (TxDOT) has focused HMA research efforts on solving the problem of rutting, which occurs in the early life of the pavement. Rutting creates a dangerous situation as water can accumulate and cause a vehicle to hydroplane. But designing HMA mixtures to combat rutting may result in long-term fatigue cracking.

“TxDOT is concerned that a lot of the emphasis has been put on designing HMA mixtures against

rutting with polymer modified asphalt binders and lower binder contents,” says Amy Epps Martin, associate research engineer with

“Everybody recognizes that aging is an issue, especially with respect to resistance to cracking, but nobody’s ever been able to quantifiably include it in hot mix asphalt design.”

Amy Epps Martin
TTI associate research engineer

TTI. “That could possibly be setting up problems 15-20 years down the line with fatigue cracking, which is due to repetitive loading. So they wanted us to revisit designing mixtures for fatigue cracking.”

In the first phase of the project, the research team examined four different approaches for fatigue and design analysis systems for HMA mixtures. They evaluated these four

approaches with two commonly used TxDOT mixtures. One was an unmodified mixture and the other a polymer modified mixture. The researchers recommended one approach, and then looked further at different mixtures.

“Throughout this project, we also looked at the effects of aging since it is a long-term phenomenon that’s going to have a big impact on mixture resistance to cracking,” says Epps Martin. “Everybody recognizes that aging is an issue, especially with respect to resistance to cracking, but little effort has been focused on quantifying the effects in HMA mix design.”

The research team recommended two different approaches for TxDOT and suggested additional research to further improve the fatigue analysis system and examine resistance of additional mixtures. **R**



MORE INFORMATION

For more information, please contact Amy Epps Martin at (979) 862-1750 or a-eppsmartin@tamu.edu.

Please see page 15 for related reports.



Drivers receive information about the roadway in a variety of ways. Warning lights, rumble strips and pavement markings are some roadway features that convey significant amounts of information to drivers.

A recent project for the Texas Department of Transportation (TxDOT) performed by the Texas Transportation Institute (TTI) evaluated various pavement marking materials, traffic control devices and unique treatments to determine their effectiveness in terms of driver understanding and ease of application and maintenance. TxDOT and TTI researchers, led by Assistant Research Engineer Melisa Finley, identified these materials as having the potential to increase driver awareness and safety.

“We looked at what manufacturers were selling to departments of transportation,” says TxDOT’s Greg Brinkmeyer, the project director. “Some products were effective and for a few of the others we provided suggestions to the manufacturers for improvement.”

Removable Pavement Marking Paint

In work zones, pavement markings are changed, sometimes quite often, to accommodate different phases of work. TTI researchers evaluated several prototype removable paint formulations and sum-

marized their findings with respect to durability, ease of installation and ease of removal. While the initial durability was less than ideal, the researchers provided feedback to the manufacturers, who have reformulated the removable paint in an attempt to make it durable enough to eventually be used in work zones.

In-Roadway Warning Lights

In-roadway warning lights can be added to uncontrolled crosswalks to increase driver awareness of pedestrians. For example, for most installations, in-roadway warning lights have increased the frequency that drivers yield to pedestrians by 50 to 98 percent. In-roadway warning lights also typically increase the distance at which drivers first brake for a pedestrian, reduce pedestrian wait time prior to crossing and reduce the percentage of hurried pedestrian crossings. Researchers summarized existing criteria for determining when and where in-roadway warning lights should be considered and created guidelines for their usage as a potential crosswalk enhancement.

Rumble Strips

Rumble strips alert motorists passing over them to some change in the roadway environment, such as approaching a traffic signal or departing a travel lane. Researchers measured the sound and vibration generated when driving over various types and designs of rumble strips.

Researchers looked at how the width and spacing of the rumble strips affected the change in sound, taking into account the need to alert drivers while keeping outside noise levels appropriate for the general public living or working in the area. They determined that a rumble strip 8 inches or greater in width and spaced no more than 36 inches apart generated adequate sound to alert drivers in passenger vehicles. However, for commercial vehicles, rumble strips 12 inches or greater in width and spaced no more than 24 inches apart were necessary to produce an adequate sound.

According to Brinkmeyer, “The information was incorporated into guidelines for the districts and gives uniformity to installing rumble strips statewide. No other state has such a set of guidelines.” **R**



MORE INFORMATION

For more information, please contact Melisa Finley at (979) 845-7596 or m-finley@tamu.edu.

Please see page 15 for related reports.



Retroreflections on a rainy night

*Researching Pavement Marking
Performance under Adverse Conditions*

The rainfall simulation tunnel at dusk. The tunnel, located at the Riverside Campus, is capable of simulating varying rainfall rates.

Driving at night in the rain is challenging enough. Drivers have to contend with possible hydroplaning, poor visibility and nighttime fatigue. The last thing drivers need to worry about is staying in the proper lane of the roadway due to poor pavement marking performance. Researchers from the Texas Transportation Institute (TTI) are currently involved in a project with the goal of crossing that last concern off the list.

The Texas Department of Transportation (TxDOT) sponsored this two-year project to study the performance of pavement markings under nighttime wet conditions. When water contacts pavement markings, it reduces their ability to retroreflect light from vehicle headlights back toward the driver.

“Several Departments of Transportation (DOTs) around the country surveyed drivers to identify their top concerns about roadway safety, and nighttime pavement marking visibility during wet conditions was very high on the list,” says Paul Carlson, TTI Operations and Design division head and project supervisor. “Combined with a national increase in safety, results from driver satisfaction surveys have increased the focus towards pavement markings, and led to innovations that improve wet-night pavement marking visibility.”

Researchers constructed a 1,600 foot rainfall simulation test course known as the “rain tunnel” at the Riverside Campus in Bryan, Texas. “The rain tunnel allows us to simulate varying rainfall rates,” says Jeff Miles, TTI assistant transportation researcher. “We designed the system to produce three different rainfall rates that are representative of nighttime rainfall in Texas. To study the performance of markings, we characterized the photometric performance of the markings

and measured their detection distances under various rainfall rates.” The researchers are currently in the second year of testing.

Adam Pike, also a TTI assistant transportation researcher, completed his thesis work on this project by investigating the relationship of pavement marking maximum detection distances and retroreflectivity.

Pike developed a testing apparatus to simulate rain in a lab environment so that he could measure the retroreflectivity of the various pavement markings under many levels of rain. “The simulated rainfall in the lab environment allowed us to evaluate the impact of rainfall on the retroreflectivity of pavement markings,” says Pike. “This allowed us to compare the retroreflectivity values at the various rainfall rates to the detection distances that were found in the rain tunnel. This method allowed us to investigate the current recommended testing practices for measuring retroreflectivity in a condition of continuous wetting.”

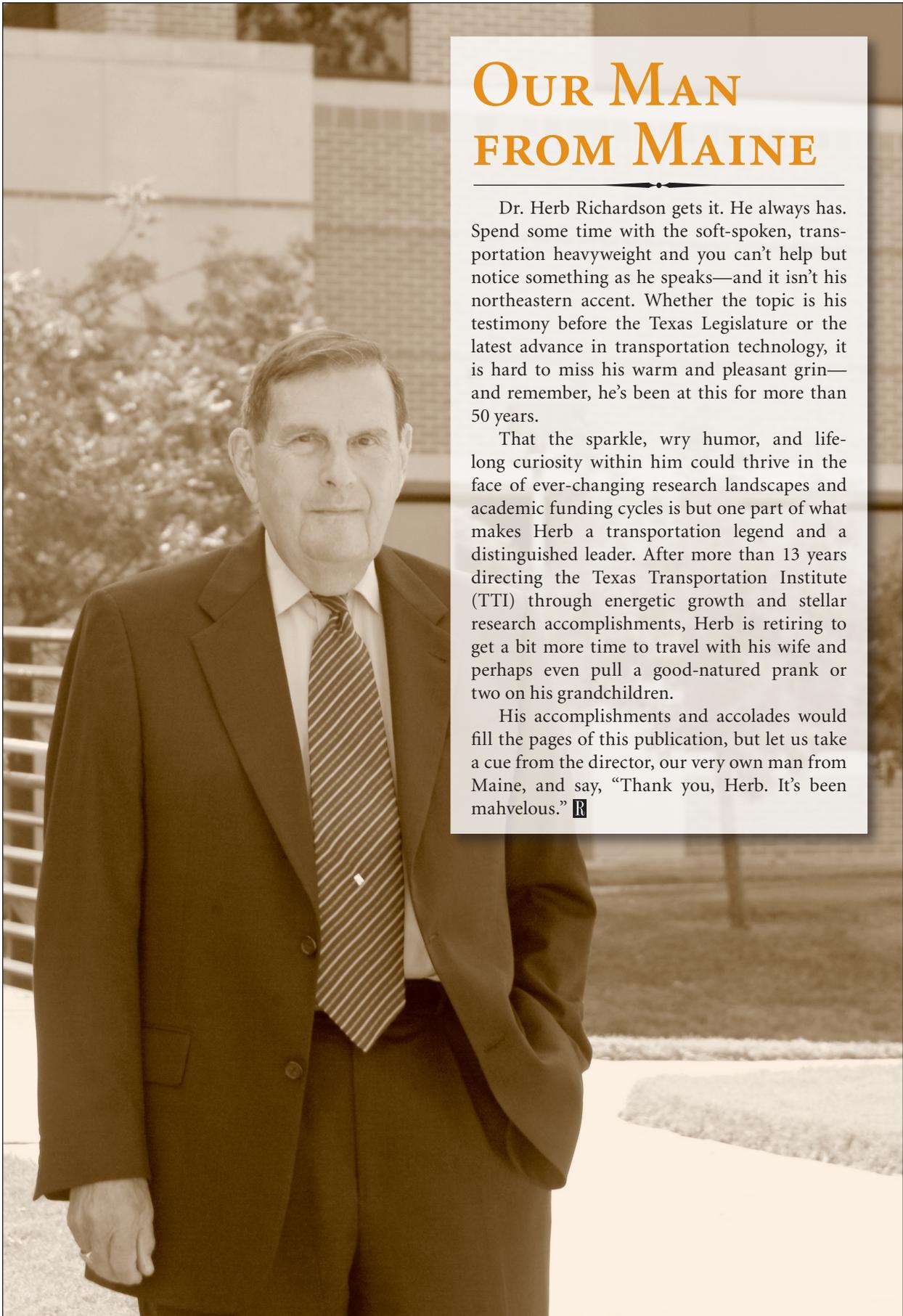
Based on their findings, the team developed recommendations for the American Society for Testing and Materials (ASTM), and their recommendations are already affecting change in policies used in the United States and worldwide. “We presented the project findings to ASTM, which led to several modifications to their existing standards and specifications for measuring wet retroreflectivity,” says Carlson. **R**



MORE INFORMATION

For more information, please contact Paul Carlson at (979) 847-9272 or paul-carlson@tamu.edu.

Please see page 15 for related reports.



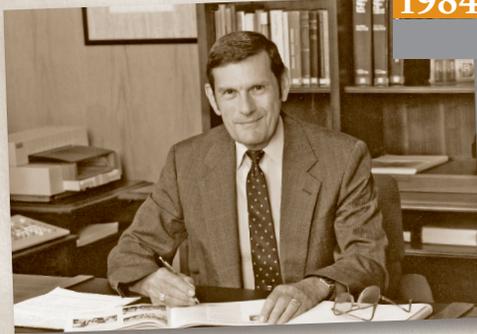
OUR MAN FROM MAINE

Dr. Herb Richardson gets it. He always has. Spend some time with the soft-spoken, transportation heavyweight and you can't help but notice something as he speaks—and it isn't his northeastern accent. Whether the topic is his testimony before the Texas Legislature or the latest advance in transportation technology, it is hard to miss his warm and pleasant grin—and remember, he's been at this for more than 50 years.

That the sparkle, wry humor, and life-long curiosity within him could thrive in the face of ever-changing research landscapes and academic funding cycles is but one part of what makes Herb a transportation legend and a distinguished leader. After more than 13 years directing the Texas Transportation Institute (TTI) through energetic growth and stellar research accomplishments, Herb is retiring to get a bit more time to travel with his wife and perhaps even pull a good-natured prank or two on his grandchildren.

His accomplishments and accolades would fill the pages of this publication, but let us take a cue from the director, our very own man from Maine, and say, "Thank you, Herb. It's been mahvelous." **R**

DECADES OF DEDICATION



1984

Dr. Herb Richardson joins the Texas A&M University System as the system's vice chancellor for engineering; he also accepts an appointment as the dean of engineering at Texas A&M University.

IMPACT: Under Richardson's leadership, the Texas Engineering Experiment Station, the Texas Engineering Extension Service and the Texas Transportation Institute were joined to form an integrated Engineering Program.

1985

DIRECTOR OF THE TEXAS ENGINEERING EXPERIMENT STATION

Richardson holds a tenured position as distinguished professor of engineering, the highest academic rank in the university.

IMPACT: Faculty size and quality were dramatically increased throughout the Engineering Program; annual expenditures increased from \$57 million to \$122 million.



1991

1986

DEPUTY CHANCELLOR FOR ENGINEERING

IMPACT: By 1991, the Engineering Program would include nearly 10,000 engineering students, 2,400 employees and an annual budget of \$120 million. The college's national rank increased from 30th in 1984 to 13th in 1991.

CHANCELLOR OF THE TEXAS A&M UNIVERSITY SYSTEM

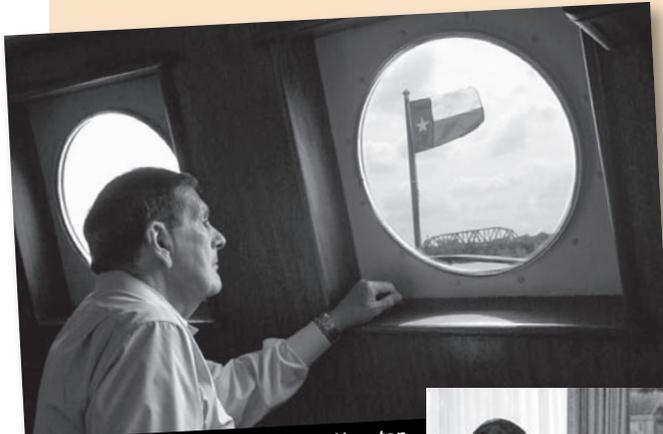
IMPACT: Richardson presided over an annual budget of some \$1.2 billion. He worked with the Board of Regents to restructure the System Administration, netting a cost savings of 20 percent, or \$2 million. The Technology Licensing Office was created to develop and commercialize intellectual property. The system received an 8 percent increase in general revenue.



1993
2006

DIRECTOR OF THE TEXAS TRANSPORTATION INSTITUTE AND ASSOCIATE VICE CHANCELLOR FOR ENGINEERING

IMPACT: For 13 years, Dr. Richardson has led the nation's largest university-affiliated transportation research organization. Within five years of assuming this role, yearly research expenditures increased by 50 percent, state expenditures by 24 percent and private expenditures by 187 percent. Four new national centers of excellence were won, and in 2003 the Texas Legislature established TTI's Center for Transportation Safety. Richardson presided over steady growth in cutting-edge transportation research funding, bringing the current operating budget to approximately \$40 million and the staff to some 600 dedicated professionals.



Richardson aboard the M/V Sam Houston during a TTI Council meeting.

"TTI has been fortunate to have had the right leadership at the right time in our history. Herb was the right person to lead this organization the past 13 years. His ties to the academic community and within the A&M System served us extremely well, and his reputation in the Texas legislature also helped us greatly. As Herb steps down as director, TTI is as strong as it has ever been. We owe him a huge thanks for all he has done to position us well to move into the future."

*Dennis Christiansen
Deputy Director
Texas Transportation Institute*

The career of Dr. Herb Richardson is a testament to excellence and dedicated service to the Texas A&M University System and his fellow man. What a privilege it is as a graduate of Texas A&M, to honor his work and legacy.

Thank you Herb for the hard work, sacrifice, and shining example to us all. I wish you well in all your future endeavors."

*U.S. Representative
Chet Edwards
17th District of Texas*



Richardson and Director Emeritus of TTI Charley Wootan.

"Herb Richardson is an individual of exceptional intellect, experience, commitment and dedication. He has served Texas A&M and The Texas A&M University System admirably in several key positions since coming to Texas from MIT in 1984, and his engineering and related expertise and wise counsel, in transportation technology for

example, have been sought and received by a host of top-level entities in both the public and private sectors.

As he moves into at least some degree of retirement, Herb will unquestionably be missed here and by numerous entities at the state and national levels. But it is certainly a well-deserved and earned retirement, culminating, in essence, a half century of service in higher education, government and industry. I personally have valued his experience and counsel since I arrived at Texas A&M. On behalf of the Aggie family, I wish Herb Richardson well as he enters this new phase of his highly productive life of exceptional accomplishment."

*Robert M. Gates
President, Texas A&M University*



Richardson and David Laney re-signing the cooperative agreement in Austin.

"I want to congratulate Dr. Richardson on his retirement. Many people who hold positions at his level are demanding and egotistical, but not Dr. Richardson. He is one of the most unassuming individuals I have ever worked with. It has been a pleasure to work with him, and I consider him not only a professional acquaintance but a personal friend."

*U.S. Representative Joe Barton
Sixth District of Texas
Chairman of the House Committee
on Energy & Commerce*

Herb Richardson worked very well with the Department of Transportation. He knew the benefits of a strong cooperative research program. He knew that through the implementation of innovative research, that all users of our transportation systems would benefit and that the cost of the research would pay for itself many times over.

*Michael Behrens
Executive Director
Texas Department of Transportation*



Richardson addresses Short Course attendees.



(L-R): Texas State Senator Steve Ogden; Barry Thompson, former Chancellor, Texas A&M University; current Texas Governor Rick Perry; Herb Richardson and Charley Wootan.

Herb Richardson came to Texas A&M and lifted the bar for high quality research. I had the privilege of being one of his early department heads and have enjoyed our ride to becoming a national leader in engineering education and research. Personally, he has been an outstanding mentor whose daily presence I will miss.

*G. Kemble Bennett
Vice Chancellor for Engineering
Dean of Engineering
Dwight Look College of Engineering
Director, Texas Engineering Experiment Station*

I first met Herb shortly after I joined TRB when he was selected to co-chair a congressionally mandated study committee on geometric design standards for "3R" (resurfacing, restoration and rehabilitation) highway projects. Herb had participated at TRB before, but the 3R study marked the beginning of especially close ties between Herb and the Board. He went on to chair other study committees; joined the TRB Executive Committee and became its chair; and when he became the TTI director, assumed the leadership of one of TRB's most prestigious research partners.

Through all of this, Herb has brought not only intellect and judgment, but the sense of purpose—and humor—that so often make the difference. Herb made his mark in transportation as an outstanding researcher, teacher, administrator, and perhaps most of all, professional colleague. I know I am speaking for many of those colleagues in saying that he has earned our gratitude and respect.

*Robert E. Skinner, Jr.
Executive Director
Transportation Research Board*



Richardson and Henry Gilchrist at the Gilchrist Building dedication ceremony.



Richardson at TTI's crash testing facility.

Emissions testing on the go

TTI acquires portable emissions testing equipment

Emissions testing at the Texas Transportation Institute (TTI) is taking a major step forward with the recent acquisition of portable emissions measuring system (PEMS) equipment. Air quality continues to be a major concern in Texas, the United States and throughout the world. Although there are many sources of air pollution, vehicle emissions is one of the major contributors. Unlike traffic congestion, exhaust emissions are not easily observed and must be deliberately measured. Environmental and transportation researchers focus on methods to accurately measure vehicle emissions to help identify approaches to reduce pollution.

Previously, emissions testing was performed in a controlled laboratory setting, and in some cases the engine had to be removed from the vehicle. This has not allowed for a true test of emissions under normal vehicle operation. “Now we have the ability to test vehicle emissions during real world driving conditions,” says Joe Zietsman, associate research engineer. “In the past, there was always some concern over the ability of laboratory testing to ac-

curately replicate real world driving conditions.”

“Real-time emissions testing is in line with TTI’s central research activity of assessing actual operating conditions,” notes Herb Richardson, TTI director. “We are expanding our research staff to include individuals with expertise in testing and analyzing vehicle emissions.”

The PEMS unit weighs about 90 pounds and is comprised of gas analyzers, an engine diagnostic scanner, a

global positioning system (GPS), an exhaust flow meter and wireless connection to external computers that record and process measurements.

Several research projects are already underway including testing

- emissions of Mexican drayage trucks in El Paso and other border crossings, sponsored by the State of Texas;
- emission impacts of alternative fueled refuse vehicles in El Paso, sponsored by the State of Texas;
- biodiesel fueled school bus emissions, sponsored by Capital Area Council of Governments (CAPCOG);
- emissions under high-speed operations in El Paso, sponsored by the Houston Advanced Research Center, EPA and the State of Texas; and
- recycled natural gas powered refuse truck emissions, sponsored by the State Energy Conservation Office.

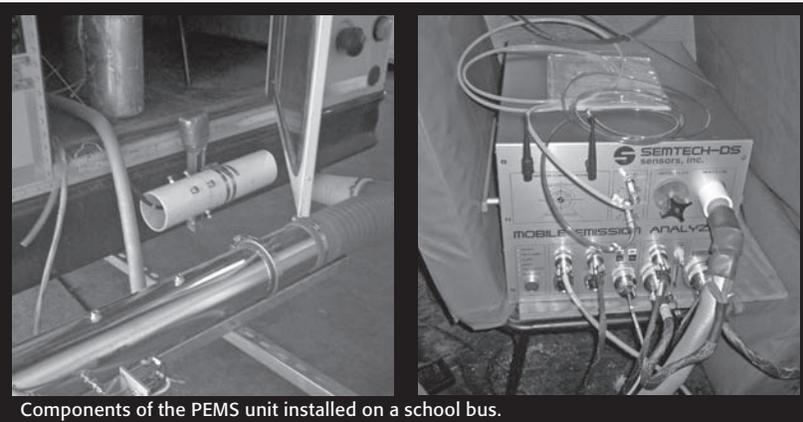
“TTI’s purchase of the PEMS equipment is opening the door for all kinds of research possibilities,” says Bill Gill, director of air quality at CAPCOG. “And we are looking forward to pursuing future opportunities with them.”

Other potential applications for TTI’s PEMS testing include

- evaluating proposed mobile source emissions reduction programs for potential emissions credits;
- helping state and local agencies evaluate potential mobile source actions to meet air quality improvement needs under the State Implementation Plan required by EPA; and
- testing emissions characteristics of new technologies, fuels and applications. 

“Now we have the ability to test vehicle emissions during real world driving conditions,”

says Joe Zietsman, Associate Research Engineer



Components of the PEMS unit installed on a school bus.



MORE INFORMATION

For more information, please contact Joe Zietsman at (979) 458-3476 or Zietsman@tamu.edu. Please see page 15 for related reports.

Christiansen Selected Sole Finalist for Director of TTI



Christiansen

The Board of Regents of the Texas A&M University System has unanimously selected Dennis Christiansen as the sole finalist for the position of director of the Texas Transportation Institute (TTI).

When appointed, Christiansen, the current deputy director of TTI, will succeed Herbert Richardson, who is retiring after 22 years of service to the A&M System. Richardson has served 13 years as director of the Institute and nine years in other leadership positions within the A&M System including chancellor, dean and vice chancellor of engineering and director of the Texas Engineering Experiment Station.

Christiansen has spent most of his career at TTI, beginning in 1972 as an assistant research engineer, and working his way up in the organization as associate research engineer, program manager, research engineer, division head, associate director and most recently agency deputy director. As dep-



Christiansen speaking during a Hall of Honor induction ceremony.

uty director, he is responsible for the day-to-day operations of the Institute.

The Board of Regents may consider the appointment of Christiansen to the TTI director's position after the 21 days required by state law for public notice of the appointment with the Texas Secretary of State. If approved, Christiansen will become only the fourth director of TTI in its 56 year history. The other Di-

rector candidates were Oliver McGee, Kenneth Button, Jon Epps and Hani Mahmassani.

"This announcement marks a major historic moment and represents an extremely positive step for our agency," says Richardson. "Dennis brings a wealth of experience, skill, vision and dedication to the position of Director." ■

TTI launches new website

For the first time in almost a decade, TTI's internet site has been completely revamped and is available to the public at <http://tti.tamu.edu/>.

"This website represents months of full-time work from dozens of people who have brought our organization into the 21st century," says TTI's Chief Information Officer and Internet Project Manager Kassandra Agee-Letton. "It is truly a state-of-the-art site that is interactive, dynamic and can be updated minute-by-minute."

The site features news articles, a vast selection of research reports and projects, a licensed Google® search engine and a weekly selection of featured TTI researchers.

"We think the new site is crisp, clean and easy to navigate," says TTI Senior Communications Specialist Richard Cole, who led the project for the Communications group. "We are most proud of its dynamic characteristics; meaning that its content is connected to numerous databases which allows information to be distributed throughout the site. And the searches are lightning fast...much better than before."

As part of the website redesign, students, employees and outside professionals offered feedback on the site including ease of navigation, overall look and other factors. Although the site is available, some fine-tuning and other improvements will continue as needed. ■



Dudek retires from TTI



Dudek

Connie Dudek, research engineer in the Operations and Design Division and professor in the Department of Civil Engineering at Texas A&M University, announced his retirement from the Texas Transportation Institute (TTI). Dudek had nearly 40 years of service in the Texas A&M University System.

After earning his degree in Civil Engineering at the University of Detroit in 1960, Dudek worked as a traffic engineer for the Michigan Department of State Highways. He then moved to Texas to earn his master's and PhD degrees at Texas A&M University.

During his distinguished career, Dudek served as director of the Southwest Regional University Transportation Center (SWUTC), which serves the states of Arkansas, Louisiana, New Mexico, Oklahoma and Texas. Dudek was also the program manager, project director, principal investigator, principal researcher or study supervisor on over 30 research projects sponsored by state and federal agencies.

Over the last 15 years, the academic portion of the Texas A&M SWUTC program has been designated as an "Advanced

Institute (AI)" administered by the Department of Civil Engineering and led admirably by Dudek. The groundbreaking innovations introduced by Dudek, most notably the Mentors Program and other activities, brought national recognition to TTI and the Civil Engineering Department's transportation educational programs. ■



Dudek (bottom left) with mentors and students in the 2002 Mentors Program.

Lancaster honored at reception

Susan Lancaster, former director of the Communications Department at the Texas Transportation Institute (TTI) formally retired in August. Lancaster was honored at a reception in the Gilchrist Research Building on August 31.

During her 20 years of leadership, the communications group grew from a staff of seven to over 34 and became one of the premiere marketing units in the Texas A&M University System.

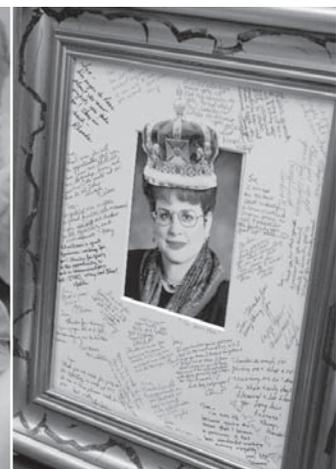
During her reception, friends and colleagues shared warm memories of Lancaster. Terri Parker, director of communications for the Texas A&M University System, credited Lancaster with helping put the A&M System on the map during a period of tremendous growth in the 1990s.

Kim Miller, manager of visual media, began working for Lancaster as a graphics designer in 1993 and said that "Sue had a talent for attracting creative people

and knew how to motivate them."

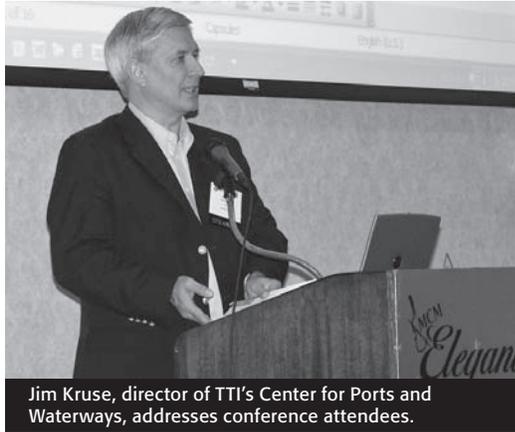
TTI Deputy Director Dennis Christiansen said that former Director Charley Wootan "had a vision for what TTI's communication group could and should be, and Sue made that happen."

Recently, Lancaster served on the College Station City Council. College Station Mayor Ron Silvia and other city council members attended the reception. Lancaster intends to pursue other public servant roles after her retirement. ■



(left) Terri Parker shares a few memories of Lancaster during the reception. (center) Lancaster with a retirement gift from TTI. (right) Staff members with TTI's Communications group signed a homemade card for Lancaster.

Ports and Waterways Conference



Jim Kruse, director of TTI's Center for Ports and Waterways, addresses conference attendees.

The two-day 2006 Texas Ports and Waterways Conference sponsored by TTI wrapped up July 28 in Beaumont with more than 90 professionals in attendance. The conference focused on providing practical information for port authorities, engineers, consultants, government officials and others who deal with the development and management of port facilities in Texas.

"The feedback I got from the attendees was that they appreciated the opportunity to hear from experts and fellow transportation managers about the issues that impact them on a daily basis," says Jim Kruse, the director of TTI's Center for Ports and Waterways.

The conference included presentations about the environment, regulations and disaster preparation as they relate to ports and waterways. Also, Assistant Agency Director Steve Roop presented information about his freight shuttle project. ■

New border inspection method announced at CIITR

State Senator Eliot Shapleigh used the Texas Transportation Institute's Center for Intelligent International Transportation Research (CIITR) office in El Paso as the backdrop for a major announcement detailing an innovative method for minimizing redundant security checks at border crossings and therefore reducing congestion. The news conference concerned a project using intelligent software agents and its \$4.5 million funding by the El Paso Metropolitan Planning Organization.

The project includes the use of video cameras at Mexican factories that will monitor the loading of tractor-trailer rigs. Global positioning system devices then monitor the trucks to make sure they do not deviate from their planned routes to the border. The system would eliminate the need for each truck to be searched by custom agents, which is a major contributor to congestion problems at the border.

The Mexican government has agreed to the use of Secure Manufacturing Zones and the use of intelligent software agents. The senator from the Mexican state of Chihuahua, Jeffrey Jones, joined Shapleigh for the announcement.

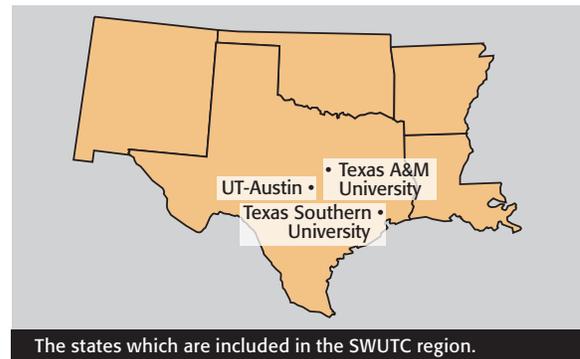
An El Paso company developed the intelligent software that will be used in the project. ■

TTI named lead agency for University Transportation Center

The Texas Transportation Institute (TTI) has been named lead agency for the Southwest Region University Transportation Center (SWUTC), overseeing an annual \$2 million dollar grant for the next four years. The United States Department of

Transportation made the announcement recently following a competitive process. The grant money was allocated by congress in last years' highway transportation bill; The Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users, or SAFETEA-LU.

TTI Senior Research Economist Dock Burke has been the center's director since 1992. "We are excited about being selected as the Regional UTC for the next four years," says Burke. "SWUTC's grant funding provides opportunities for research, educational and technology transfer initiatives that complement other TTI programs. This encourages our researchers, faculty and students to develop project ideas which typically might not get funded by other contract research entities."



The states which are included in the SWUTC region.

SWUTC was established at the Texas A&M University System in October 1988. SWUTC is a consortium comprised of The Texas A&M University System, The University of Texas at Austin and its Center for Transportation Research and Texas Southern University's Center for Transportation Training and Research. The current goals of SWUTC include supporting economic growth and trade, enhancement of mobility and the development of the transportation workforce. SWUTC is one of the 10 regional centers of the University Transportation Centers Program.

TTI in the Texas A&M University System serves as the lead institution. SWUTC has been continuously headquartered in College Station on the main Texas A&M campus. ■

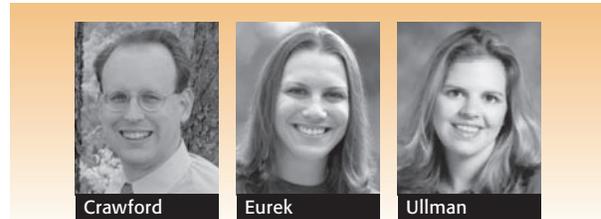
TTI at TexITE

The Summer Meeting sessions of the Texas Chapter of the Institute of Transportation Engineers (TexITE) were held at the College Station's Hilton Hotel and Conference Center June 23-24. Dennis Christiansen's discussion of the interstate anniversary and Russell Henk's *Teens in the Driver Seat* were among six TTI presentations. Chris Poe and Gary Thomas served as moderators.

Experts updated attendees on topics that included toll roads, hurricane evacuations, safety and red light enforcement. According to Poe, the director of TTI's Center on Tolling Research, two presentations on video tolling detailed new information for most attendees. Video tolling will supplement current transponder technology and offer transactions without the need for a toll tag. License plates will be photographed and a bill will be sent to vehicle owners anywhere in the country using Department of Motor Vehicles records. Video tolling will soon be in operation on State Highway 121 in Denton County and Loop 49 in Tyler.

Karl Zimmerman, Andrew Ballard, Brian Bochner and Scott Cooner were among the other TTI presenters.

Jason Crawford was elected to president of TexITE and will begin his term in January 2007. "I am honored to lead this fine organization in the coming year. I have enjoyed serving TexITE in various ways and look forward to my experiences



serving as its president," says Crawford, who is an associate research engineer at the Arlington urban office.

TTI staff also took home several awards. Brooke Ullman was awarded the District 9 Young Member of the Year award. This award is presented annually to recognize a District 9 member age 35 or younger that has demonstrated unusual or continuing and outstanding contributions to TexITE and other professional groups through their leadership, commitment to excellence and activism.

Other awards presented were Outstanding Student to Erin Eurek, which recognizes the outstanding student member in each of the TexITE Student Chapters and the Outstanding Student Chapter for Texas A&M University, which recognizes the outstanding student chapter of TexITE. The winner of the award is forwarded to ITE headquarters to vie for the international award. ■

Lopez addresses ITE student chapter

Carlos Lopez, director of TxDOT Traffic Operations, told members of the Texas A&M University Institute of Transportation Engineers (ITE) student chapter that the magnitude of 43,000 traffic deaths each year in the U.S. is unacceptable, and part of the solution could lie overseas where progress is being made thanks to technology and improvements.

In 2004 and 2005, Lopez was part of what's called a scan tour, in which transportation professionals travel abroad to see firsthand what other countries are doing to tackle traffic problems. "While congestion is commonplace in large cities within the United States, it is not to the same degree and duration as that seen in Japan and Europe," Lopez said. "They have to build elevated roadways that are literally only a few feet away from skyscrapers."

While visiting France, Lopez was introduced to automated speed enforcement, which was implemented at the urging of the prime minister to do something about the "out of control"



Lopez speaks to members of the Texas A&M ITE student chapter about automated speed enforcement.

number of accidents and fatalities on a congested roadway near Paris. In automated speed enforcement, cameras take photos of the license plates of speeding cars, and tickets are sent in the mail to violators. "We were told that the number of deaths decreased by 50 percent after the cameras were installed," Lopez told the young engineering students.

Lopez believes that similar use of automated enforcement in the United States can save lives, but knows it is a controversial issue. "I think it's going to have to hurt first before anything is done on a blanket-basis nationwide. But, I think it is starting to hurt. Populations the size of Lufkin are wiped out every year in the United States because of traffic deaths." ■

Sunkari receives Traffic Engineering Council Award



Sunkari accepting the award for Outstanding Council Project.

Srinivasa Sunkari, associate research engineer at the Texas Transportation Institute (TTI), received the Traffic Engineering Council Award for Outstanding Council Project at the Institute of Transportation Engineers (ITE) 2006 Annual Meeting and Exhibit, held August 6-9 in Milwaukee.

The project report was entitled *Benefits of Retiming Traffic Signals: An ITE Informational Report* and was completed by the ITE Traffic Engineering Council in 2005.

ITE is an international educational and scientific association of transportation professionals who are responsible for meeting mobility and safety needs. Founded in 1930, ITE serves as the gateway to transportation knowledge and advancement through meetings, seminars and publications, and through its network of more than 17,000 members working in more than 92 countries. ■

Seat belt use reaches milestone

For the first time in two decades of tracking seat belt use in Texas, TTI researchers have found that more than 90 percent of motorists are buckling up. "The 90 percent figure represents a significant accomplishment on the part of many traffic safety professionals who have worked to bring seat belt use up," says Katie Womack, project manager of the statewide safety belt survey. "By reaching that mark we think we can say that seat belt use has actually become part of the Texas driving culture, helped along by enforcement and campaigns like 'Click-it or Ticket'."

Womack and her team have been monitoring safety belt use since before the mandatory seat belt law went into effect in 1985. At that time, only about 15 percent of drivers were using them. After the law, seat belt use jumped to



67 percent and has been inching up since then. "In 2002, when the 'Click-it or Ticket' campaign got underway, the usage rate got another upward push. Reaching 90 percent this year is a real milestone," Womack says.

The report indicating a 90.4 percent safety belt use by drivers and front seat passengers has been turned over to the Texas Department of Transportation (TxDOT). ■

Former FHWA Administrator Thomas D. Larson dies

Thomas D. Larson passed away Thursday, July 20. Throughout his life, Larson advanced whatever he touched through his unique combination of vision, technical knowledge and creative drive.

When Herb Richardson took over as the Texas Transportation Institute (TTI) director, Larson provided assistance with the transition and worked with the Institute's staff in pursuing continuous improvement. Larson was also a close friend of former director emeritus of TTI Charley Wootan.

"Tom worked closely with TTI for many years, and was a frequent visitor to College Station," says TTI Deputy Director Dennis Christiansen. "He provided exceptional guidance and help in promoting a number of our research initiatives, and he worked closely with us to identify ways to improve the internal operations of the Institute. Tom was a true friend and supporter of TTI." ■



Former FHWA administrator and PTI co-founder Thomas Larson.

Photo courtesy Jim Lunkens-Gable, Pennsylvania Transportation Institute.

Related reports

The following reports provide information about topics covered in this issue of *Texas Transportation Researcher*. Please see back cover for ordering information. Related reports might be available or scheduled for later publication:

Technical Report 0-4468-1, Preliminary Fatigue Analysis of a Common TxDOT Hot Mix Asphalt Concrete Mixture, by Lubinda Walubita.

Technical Report 0-4468-2, Comparison of Fatigue Analysis Approaches for Two Hot Mix Asphalt Concrete (HMAC) Mixtures, by Lubinda Walubita.

Technical Report 0-4468-3, Application of Calibrated Mechanistic Fatigue Analysis with Aging Effects, by Lubinda Walubita.

Technical Report 0-4728-2, An Assessment of Various Rumble Strip Designs and Pavement Marking Applications for Crosswalks and Work Zones, by Melissa Finley.

Project Summary Report 0-4728-S, An Assessment of Various Pavement Marking Applications and Rumble Strip Designs, by Melissa Finley.

Technical Report 0-5008-1, Evaluation of Wet-Weather Pavement Markings: First Year Report, by Paul Carlson.

THE BACK ROAD



As we drive our state's highways and city roads, we rarely think about the roadway itself. Unless we pass through a construction zone, we often have no idea of the complexity of materials and design that goes into building those roadways. This issue of the Researcher highlights some of the research that helps make our roads better, including ways to reduce the shrinkage of the cement-treated

bases that underlie many roads. Another study is evaluating hot mix asphalt concrete mixtures in an effort to reduce the fatigue experienced under specific environmental or traffic loading conditions. Still other TTI researchers are assessing how various traffic control devices like rumble strips and other pavement markers can increase driver awareness and safety. A parallel study is looking at how wet weather can affect the visibility of these markings.

Another important transportation issue is how vehicles affect air quality. As part of our ongoing environmental research effort, Institute researchers are beginning some leading edge research on emissions. A new project will give scientists a much more accurate assessment of the emissions from any internal combustion engine, using portable emission monitoring equipment.

This will be my last column as TTI Director. At the end of October, I'll be relinquishing this responsibility to my successor, who as of this writing, has yet to be selected. I've thoroughly enjoyed my tenure with TTI. It has been a distinct honor to work with the outstanding staff, and to be a part of the important work they do to keep Texas's transportation system one of the best—if not THE best—in the nation.

My thanks to all of you who support the Institute and who value the work we do. Your interest and contributions help us do a better job for the people of Texas.

Herb Richardson

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TTI Publications

TECHNICAL REPORTS

"Managed Lanes Handbook," by Beverly Kuhn, **0-4160-24**, 04-May-06.

"Characterizing the Effects of Routine Overweight Truck Traffic on SH4/48," by Emmanuel Fernando, **0-4184-1**, 03-May-06.

"Remote Monitoring Moisture Content in Test Pavement in Waco and Bryan Districts," by Richard Liu, **0-4415-2**, 03-April-06.

"Development of a Comprehensive Urban Commodity/Freight Movement Model for Texas," by David Pearson, **0-4430-1**, 30-June-06.

"Preliminary Fatigue Analysis of a Common TxDOT Hot Mix Asphalt Concrete Mixture," by Lubinda Walubita, **0-4468-1**, 04-May-06.

"Application of Calibrated Mechanistic Fatigue Analysis with Aging Effects," by Lubinda Walubita, **0-4468-3**, 04-August-06.

"New Technologies for Evaluating Flexible Pavement Construction: Year 1 Report," by Stephen Sebesta, **0-4774-1**, 29-June-06.

"Fiber Reinforcement in Prestressed Concrete Beams," by Hemant Dhonde, **0-4819-1**, 06-April-06.

"Implementation of the Real-Time Transverse Pavement Profile Measurement System: Comprehensive Report," by Roger Walker, **5-1782-01-1**, 13-March-06.

"Use of Foundry Sands in Transportation Applications," by Cumaraswamy Vipulanandan, **7-4935-1**, 20-March-06.

PROJECT SUMMARY REPORTS

"Development of Soil Moisture Sensor for Measuring Moisture Content in Pavement Subgrade," by Richard Liu, **0-4415-S**, 19-July-06.

"New Technologies for Measuring Pavement Quality," by Stephen Sebesta, **0-4774-S**, 29-June-06.

"Fiber Reinforcement in Prestressed Concrete Beams: Summary," by Hemant Dhonde, **0-4819-S**, 29-April-06.

"Implementation of the Real-Time Transverse Pavement Profile Measurement System: Summary Report," by Roger Walker, **5-1782-01-S**, 03-March-06.

"Applications for Foundry Sands: Flowable Fill and Cemented Sand," by Cumaraswamy Vipulanandan, **7-4935-S**, 20-March-06.

ORDERING INFORMATION

To order published reports or project summary reports listed above, please contact:

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Report prices vary depending on the length. Project summary reports are \$5.00 each. The Texas Transportation Institute accepts checks, money orders and credit cards.

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