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ON THE COVER: TTI research helps develop the procedures and standards that shape our national transportation system.

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TTI conducts research for national and international, as well as state and private-sector, sponsors. The Institute is actively involved in national and international organizations, and a number of our leading researchers chair committees or hold other leadership positions on, to name a few, the Transportation Research Board, ASTM International, and the Institute of Transportation Engineers. Through these affiliations and others, TTI researchers are helping shape the future transportation system.

Take ASTM International, for example. You may not know it, but you benefit from ASTM’s work every day. For more than a century, ASTM has been the primary standards agency worldwide. Today, ASTM committees have developed and maintain more than 12,000 standards used around the world — all intended to ensure and advance safety, consistency and durability in the products and processes that are a part of our everyday lives.

Two ASTM committees chaired by TTI researchers are generating standards aimed at improving national security around the world. One committee has developed a standard for testing anti-ram barriers that protect buildings from terrorist bombings, while the other is developing the first standard for boat barriers that will protect ships in the same way. Among other collaborations, TTI is also working with ASTM to create a new retroreflectivity test method for rain-soaked pavements to make driving at night safer.

The Federal Highway Administration (FHWA) and other federal agencies conduct scan tours to learn from the experiences of other countries. TTI researchers are assisting with these scans, acting as the official reporters and documenting best practices applications.

Like its professional staff, TTI facilities are also sought out by sponsors. Two of these are TTI’s newly accredited Proving Ground Research Facility, which has conducted hundreds of standards tests, and the Institute’s Hydraulics, Sedimentation, and Erosion Control Laboratory, which is conducting tests as part of an FHWA Pooled Fund Project to improve our nation’s water quality.

As you will see in this issue, TTI plays an important role in helping develop transportation standards — one more reminder that what starts out as a TTI research project can result in significant improvements to transportation systems and safety nationwide . . . indeed, around the world.

When you think about it, the benefits of research know no borders. At the Texas Transportation Institute, we are proud of our name and our home state. We are equally proud of our key role in helping develop standards across the broad spectrum of transportation. And that benefits everyone, wherever they might call home.

by Dennis Christiansen
TTI Director
According to the Motorcycle Industry Council, a trade association, 1.1 million motorcycles were sold in the United States last year — 30 percent more over 2001, when 850,000 motorcycles were sold. But the increase in motorcycle sales and registrations has coincided with a marked increase in motorcycle-related deaths, which jumped 50 percent nationally over the same period.

“These increases cancel out any benefits we’ve realized from reducing the number of passenger car deaths,” says Associate Research Scientist Patricia Turner with the Center for Transportation Safety (CTS) at the Texas Transportation Institute (TTI). Turner leads the Center’s motorcycle safety efforts.

In 2007 — the last year for which the National Highway Traffic Safety Administration has figures — car occupant fatalities declined by 5 percent, while motorcyclist fatalities increased by 7 percent over the previous year.

When gasoline topped $4 a gallon, motorcycles became a popular alternative for drivers looking to be more fuel efficient and save money. While most cars average around 22 miles per gallon, motorcycles easily average 50 to 60 miles per gallon. It is hard to know for certain how many new riders chose to ride a motorcycle or scooter. But motorcycle registrations keep rising with more than six million motorcycles registered in the United States, compared to about four million only 10 years ago.

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Motorcyclists alone account for 13 percent of all deaths related to traffic crashes in the United States.

Last year, Texas had 431,571 registered motorcyclists. Of those, 526 were killed, according to the Texas Department of Transportation (TxDOT) preliminary crash data. While motorcycle registrations in Texas rose 13 percent between 2007 and 2008, motorcycle fatalities increased 31 percent.

“Because there are a lot more motorcycles out there, we’re seeing more motorcycle crashes,” Turner said. Due to their size, motorcycles can easily be overlooked in traffic, and crashes often result in injury or even death.

To reduce these crashes, TTI partnered with TxDOT and the Texas Department of Public Safety (DPS). Over the past three years the team has worked to develop educational materials for drivers and riders to improve safety for motorcyclists. The Look.Learn.Live campaign — first launched in 2007 — is a three-tiered approach to increase motorist awareness of motorcycles (Look), rider training (Learn) and rider awareness (Live). TTI launched a website — http://www.looklearnlive.org — to provide a centralized location for campaign messages, public service announcements (PSAs) and safety information for drivers and motorcyclists.

In conjunction with the International Ride to Work Day (http://www.ridetowork.org/) in June, TTI launched the Look Twice for Motorcycles campaign message to remind drivers to be more aware of motorcycles on the roadway and to share the road safely.

The message speaks straight to the issue since 50 percent of all fatal motorcycle crashes involve another vehicle. More often a vehicle turns left in front of a motorcycle or hits the motorcycle while the rider is passing or overtaking the vehicle. “I never saw the rider” is one of the most common responses the driver says after he or she has struck a motorcyclist.

The Look Twice for Motorcycles campaign message will reach residents via billboards, transit bus wraps, and radio and television PSAs. The message also incorporates the “Share the Road” decal displayed on TxDOT roadway signs across the state.

“We want to reach as many people as we can,” explains TxDOT Motorcycle Program Manager Gonzalo Ponce. “Registered motorcycles are at an all-time high in Texas. A motorcycle may not have been there when you looked before.”

The campaign runs throughout the summer and includes messages directed at motorists and motorcyclists. “We’re reminding drivers to be on the lookout for the nearly 400,000 motorcyclists on Texas roadways, especially at intersections where many crashes happen,” says Ponce.

TTI and TxDOT have these safety tips for motorists who share the road with motorcyclists:

- Look twice for motorcyclists — at intersections, when entering highways and whenever turning or changing lanes. The small size of motorcycles often makes them hard to see, and motorcyclists can get lost in blind spots.
- Always maintain a safe following distance. Motorcycles can stop more quickly than passenger vehicles.
- When passing a motorcyclist, move to the other lane and allow a full lane for the motorcycle. After doing so, avoid re-entering the lane too quickly.
U.S. benefiting from TTI’s research abroad

If you have ever studied abroad, you know that experiencing a different way of doing things can provide a unique perspective. In short, seeing things from outside the box can help you build a better box.

With a renewed focus on improving the United States’ national infrastructure, learning useful technologies and best practices from nations abroad is even more valuable now. Many of the transportation challenges we face have already been solved overseas.

The International Technology Scanning Program, which is carried out by the Federal Highway Administration (FHWA) in partnership with the American Association of State Highway and Transportation Officials (AASHTO) and the Transportation Research Board’s National Cooperative Highway Research Program (NCHRP), reaches out to the international transportation community through scan studies to develop solutions to our domestic transportation issues quickly and efficiently. Several Texas Transportation Institute (TTI) researchers have worked with this program as report facilitators on scans and are now helping to implement solutions that will benefit the entire country.

“The International Technology Scanning Program has had a positive impact on United States policies and practices and has led to significant improvements to our highways and highway transportation systems,” says Hana Maier, manager of the...
International Technology Scanning Program at FHWA. “The success of the program is a credit to all who participate and their commitment to implementing promising foreign technologies and practices that have the potential to yield significant benefits for the United States highway system and its users.”

According to Maier, it’s TTI’s knowledge of the subject matter, as well as its proven expertise with implementing solutions, that makes the Institute a desirable partner for FHWA.

**Active Traffic Management**

In an effort to ensure we maximize the efficiency of the infrastructure in our major metropolitan areas, FHWA organized a scan tour for June 2006 that included stops in Denmark, England, Germany and the Netherlands.

The goal of this trip was to bring back practices that help address the challenges of increased travel demand, growth in congestion and the need to improve safety. The scan team examined speed harmonization, temporary shoulder use and queue warning systems, all active traffic management practices and approaches to congestion management that exemplify the true value of these scan tours.

“Active traffic management is a more holistic approach to congestion management,” explains Beverly Kuhn, head of TTI’s System Management Division and the report facilitator for this scan. “The package of strategies we were introduced to can include the current United States application of managed lane strategies to congested freeway corridors. Simply put, active traffic management is the next step in congestion management for us domestically.”

Seattle and Minneapolis are two cities planning to implement some of what the scan team learned. Forms of speed harmonization and queue warning will be implemented on two highways in Seattle, and a version of temporary shoulder use (a priced dynamic shoulder lane) should be operational on northbound IH-35W in Minneapolis later this year. Other states planning similar implementation efforts include New York, Missouri, Virginia and North Carolina.

**Commercial Vehicle Size and Weight Regulations**

The United States has seen a significant increase in traffic congestion due to the expansion in freight shipments on our nation’s highways. The size and weight of these commercial vehicles also accelerates the wear and tear on our roadways. This becomes an even bigger problem if vehicles are beyond size and weight regulations.

Related to this issue, TTI Associate Research Engineer Jodi Carson participated in a study during June and July 2006. Stops included Slovenia, Switzerland, Germany, the Netherlands, Belgium and France. Carson served as report facilitator for this tour, which focused on technologies for enforcing commercial vehicle size and weight regulations.
In Slovenia the scan team saw the benefits of bridge weigh-in-motion (WIM) technology and its ability to gather information such as axle weights, gross vehicle weights (GVW), axle spacing, vehicle speed and vehicle class without disrupting traffic flow during system installation and maintenance. After the Slovenia trip, the team was able to accelerate a test deployment of a bridge WIM system in Alabama.

“We believe that further United States applications of bridge WIM technology would enhance prescreening capabilities for commercial motor vehicle weight enforcement and provide important information to bridge management systems,” explains Carson.

FHWA Transportation Specialist Tom Kearney agrees with Carson: “This system has the potential of having a wide-reaching impact on improving truck weight enforcement practices as it moves forward.”

Upcoming Implementation

Two of the most recent scans, conducted in 2008, focused on international best practices for accommodating older drivers and streamlining and integrating right-of-way and utility processes with planning, environmental and design processes.

“Results are now in the early planning stage of implementation,” says Cesar Quiroga, program manager for TTI’s Infrastructure Management Program and report facilitator for the right-of-way and utility scan. “Placing an emphasis on early, effective coordination and cooperation between transportation agencies and other stakeholders during the project development process was our most important observation.”

One of the most valuable resources gained from this program is the international network being developed as chief experts from the United States meet experts from all over the world. Leveraging that experience, United States transportation professionals can continue to improve our nation’s transportation system without reinventing the wheel.

Streamlining Right-of-Way and Utility Processes

**TTI Researcher:** Cesar Quiroga  
**When:** September 2008  
**Where:** Australia and Canada

**Highlights:** From the visits to four states in Australia and two provinces in Canada, the scan team identified 20 implementation ideas that could help to streamline and integrate right-of-way and utility processes with planning, environmental and design processes in the United States. The team selected nine ideas as top priority for implementation, covering areas such as incentive-based utility relocations, corridor preservation strategies, geographical information system-based asset management systems and cooperative relationships with property owners for timely property acquisitions.

Pedestrian and Bicycle Safety

**TTI Researcher:** Shawn Turner  
**When:** May 2009  
**Where:** Denmark, Sweden, Germany, Switzerland and England

**Highlights:** This scan tour visited countries that are leaders in improving pedestrian and bicyclist safety. The tour provided an opportunity for United States transportation professionals to investigate the work being done in those countries and to identify approaches, techniques and policies that can be transferred and adopted in the United States.

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“Results are now in the early planning stage of implementation. Placing an emphasis on early, effective coordination and cooperation between transportation agencies and other stakeholders during the project development process was our most important observation.”

Cesar Quiroga,  
TTI Research Engineer
Detailed transportation funding information for Texas will soon be available to anyone with Internet access — thanks to an interactive website (called TRENDS) being co-designed by the Texas Transportation Institute (TTI) and the Texas Department of Transportation (TxDOT). It’s the first time a state’s transportation funding projection model will be available to the public. TRENDS, by the way, stands for Transportation Revenue, Estimator and Needs Determination System.

“We are regularly asked by elected officials about the funding impact of a particular measure they are considering, like an increase in the fuel tax for example,” says Jessica Castiglione, the TRENDS project director and mobility engineer for TxDOT. “Unfortunately, it’s a time-consuming process. TRENDS will be able to answer the question in a matter of seconds, thanks to the data that have been uploaded.”

The TRENDS website will not only examine transportation revenue information for the state as a whole, but will be extremely useful on a regional basis as well. TRENDS will have 25 separate revenue sub-models for each of the state’s metropolitan planning organizations (MPOs).

“Regional planners will be able to access information about the transportation funds that are specific to their areas,” says TTI Research Scientist Dave Ellis. “TRENDS will calculate the revenue potential for the various local funding options, including fuel taxes, fuel tax indexing, vehicle registration fees and VMT [vehicle miles traveled] fees.”

TRENDS will allow users to predict future revenue needs through the year 2035 based on a multitude of scenarios including population projections and the changing fuel efficiencies of automobiles, all of which impact transportation funding.

“We all know of the financial constraints facing transportation in Texas,” says Castiglione. “The TRENDS model will put us all on the same page. Hopefully, it will remove any questions about transportation funding shortfalls and the things we can do to fill the gaps.”

All of the various components of TRENDS are scheduled for completion by September of this year. However, as changes occur to variables such as cash flow forecasts, construction cost inflation and debt service, the model will be updated. Future legislative changes in revenue, expenditures and fund transfers will also be incorporated.

“TRENDS has the potential of being a great tool for not only experts in the transportation field, but for anyone who wants to know the challenges facing TxDOT during these economically stressful times,” says Ellis. “Getting the model up and going with all the complicated and detailed variables has been extremely challenging, but the transparency it will provide is well worth the effort.”

For more information, please contact Dave Ellis at (979) 845-6165 or d-ellis@tamu.edu.
U.S. Representative James Oberstar (D-Minn.), chairman of the House Committee on Transportation and Infrastructure, outlined his vision of the future of transportation when he met with leaders of the Texas Transportation Institute (TTI) during a recent visit to College Station.

It was Representative Oberstar’s first visit to TTI but not his first experience with the agency. Indeed, the congressman often cites TTI research findings during transportation committee hearings and public speeches.

The April 14 visit was arranged by Representative Chet Edwards, who referred to the Minnesota congressman as “Mr. Transportation” when introducing him at the event. Edwards represents the 17th Congressional District of Texas, which includes Bryan/College Station, TTI’s hometown.

“When Chet asked if I would like to come to College Station and meet with the Texas Transportation Institute, I said that’s like going to a birthday party for me,” says Oberstar. “This is where they do all of the great research.”

Both congressmen met privately with senior TTI leadership and Bob Johns, director of the Center for Transportation Studies at the University of Minnesota. Oberstar outlined his “future of transportation,” which focuses on transforming surface transportation programs, increasing multimodalism, enhancing livable communities, and developing new methods to fund and approve infrastructure projects.
“It was an honor to get to know Congressman Oberstar,” says TTI Agency Director Dennis Christiansen. “He has dedicated his life to mobility in the United States. He knows the way things work, he knows the issues, and he knows how important transportation is for our economy. He is also keenly aware of the vital role of transportation research.”

Oberstar was given an overview of TTI, which included details of the Universal Freight Shuttle (a zero-emission freight-movement system developed at the Institute), a “sneak peak” of the updated Urban Mobility Report (a widely publicized examination of congestion across the country) and a briefing on the Transportation Performance Measurement Program (a collaborative effort between TTI and the University of Minnesota in Oberstar’s home state).

“I salute you for your vision,” the 17-term congressman told participants. “A big problem facing America is the cost of logistics [the movement of people and goods]. TTI for years has been the nationally acknowledged leader and authority on metropolitan mobility and cost of congestion.”

During a news conference and gathering of Bryan/College Station elected officials and area leaders also hosted by TTI, Oberstar detailed his committee’s proposed $450 billion transportation bill that calls for streamlining federal funding mechanisms.

“We’re at a point where the current formula is not working very well,” he said. “We need to attack the major congestion choke points in America.” Oberstar blamed some of our congestion problems on the amount of time it takes to approve infrastructure projects. If approved, the new transportation bill would go into effect this fall.

Oberstar and Edwards spent part of their visit hearing from the mayors of Bryan and College Station and the Brazos County judge. The elected officials outlined their local road project priorities and detailed their concerns about future congestion problems.

“We are indebted to Congressman Chet Edwards for initiating the visit to TTI by Congressman Oberstar,” Christiansen said. “In our business, it is important that Chairman Oberstar knows who we are and what we do.”

**MORE INFORMATION**
For more information, please contact Terri Parker at (979) 862-8348 or t-parker@tamu.edu.
A WALL IN THE WATER

TTI researchers work to standardize water barriers

Boat barriers like the ones shown above are essential protection for many water-accessible terrorist targets because these barriers provide both deterrence and physical protection against unauthorized surface vessel intrusion. The ASTM Boat Barrier Standard will bring universal guidelines benefitting both users and producers of boat barriers.

On the morning of Oct. 12, 2000, a small boat loaded with explosives approached the port side of the United States (U.S.) Navy destroyer USS Cole, which was harbored in Aden, Yemen, for a routine fuel stop. An explosion ripped a large gash in the side of the ship, killing 17 sailors and 2 perpetrators. The suicide bombing, carried out by al-Qaeda operatives, demonstrated how terrorist elements organize and execute sophisticated attacks against U.S. targets.

Floating water barriers are gaining acceptance for their ability to provide positive protection to a facility and its personnel. These portable barriers form a protective perimeter around a ship or landside object for the purpose of keeping boats from entering the protective area. However, the performance of these barriers varies from manufacturer to manufacturer as much as the performance requirements vary among user agencies and facilities.

Responding to a request from ASTM International, the Texas Transportation Institute (TTI) is partnering with other industry agencies to develop uniform standards for physically testing and evaluating the dynamic performance of waterfront barriers.

“A standard is important because when someone is evaluating their site and trying to decide what type of barrier to purchase, they can use the standard to compare the performance of different barriers and make an informed decision about what will meet their need.”

Lance Bullard, TTI Division Head

The standard will (1) address the performance of full-scale dynamic impact tests by testing laboratories and (2) establish evaluation and performance criteria for various types of waterside barriers. The purpose of the standard is to establish (1) a definitive test methodology for establishing the crash performance of a boat barrier and (2) specify data collection and evaluation criteria for those tests that are performed. The result will be the development of a uniform standard for the performance evaluation and testing of waterfront boat barrier perimeter security devices.

“There are other waterside assets that boat barriers can be used for such as liquid natural gas terminals, cruise ship terminals and ports that receive various types of containers,” says Bullard. “It is our hope that the standards the research team develops will help to make these areas as safe as possible by allowing specifying agencies to make the correct barrier choice.”

For more information, please contact Lance Bullard at (979) 845-6153 or l-bullard@tamu.edu.
Gate keeping in the 21st century:
New Anti-Ram Standard Enhances Safety, Security

In the Middle Ages, gate keepers had it relatively easy. Castles were considered the pinnacle of defensive warfare technology. Then gunpowder was invented, and holes blasted in stone walls caused medieval strategists to reevaluate their old way of thinking.

A similar change has occurred following terrorist attacks of the last 15 years, where the preferred weapon of terrorists worldwide has become the car bomb.

“Anti-ram barriers are typically used around government buildings, infrastructure facilities, military installations or any other location where terrorist activity is a threat,” explains Dean Alberson, program manager and assistant director at the Texas Transportation Institute. “These barriers keep vehicles away from buildings to minimize damage should a car bomb explode.”

In 1985, the U.S. Department of State (DOS) created an anti-ram standard for protecting its embassies. The standard was designed to stop a medium-duty, single-unit truck and accounted for three levels of blast penetration.

Consular facilities are often squeezed into high-traffic urban areas on small lots. So as the new millennium approached, embassy bombings, like those in Kenya and Tanzania in 1998, demonstrated the need for a new standard. In 2003, DOS revised its standard to meet this new threat.

The 2003 standard limited penetration concerns to 3 feet and reconstituted the standard from a gasoline to a diesel truck. Other agencies — like the Department of Defense (DOD) and Department of Energy (DOE) — found the new standard useful . . . but incomplete.

DOD, for example, kept the original penetration ratings from the 1985 standard, which acknowledged the potential for bombings outside a 3-foot range. (Military bases are typically surrounded by wide open spaces, which create a much greater stopping distance for enemy vehicles.)

“Other concerns cropped up as well,” says Alberson. “The 2003 standard assumed a terrorist would use a 2.5-ton diesel truck to carry out an attack. But recent realities in Iraq, Afghanistan and other countries make it clear that practically any vehicle will do.”

The U.S. Army Corps of Engineers wanted a more flexible standard, so ASTM created a team in fall 2003 to address their need. Led by Alberson, the team developed ASTM F2656-07, Standard Test Method for Vehicle Crash Testing of Perimeter Barriers, that reintroduces more penetration ratings, adds design flexibility to cover a wide range of vehicles and specifies different impact velocities for some vehicle categories.

To meet the standard, vendor barriers must be tested by an accredited laboratory like TTI’s Proving Ground Research Facility. The facility then issues a mandatory report on how the equipment performed. DOS adopted ASTM F2656-07 in October 2008 and activated it Feb. 1, 2009.

“The leadership role that TTI had in the development of this consensus test standard will ultimately help ensure the protection of American lives at home and abroad,” acknowledges Ed Conrath, a senior principal with Protection Engineering Consultants. Conrath oversaw ASTM F2656-07 development.

Proving Ground Receives Accreditation

The American Association for Laboratory Accreditation (A2LA) has approved the accreditation of TTI’s Proving Ground Research Facility following an extensive assessment earlier this year. Specifically, the accreditation is “for technical competence in the field of mechanical testing.”

“The A2LA accreditation is a great thing for us,” says Assistant Agency Director Gene Buth, who heads up TTI’s Materials, Safety and Structures Group. “Even though we enjoy a great reputation, the accreditation tells potential clients that we run a credible facility dedicated to quality.”

As part of the process for the quality management standard, Buth and others put together a 450-page document about Proving Ground functions and performed numerous elements of testing procedures while measurement devices were inspected.

In a new requirement, laboratories must be accredited in order to work with federal sponsors. Previously, the Proving Ground Research Facility was listed as an acceptable laboratory by the Federal Highway Administration.
Drivers have numerous tools they can use in their quest to drive safely. Properly maintained traffic signs and pavement markings are two of them.

The Federal Highway Administration (FHWA) originally aimed its *Manual on Uniform Traffic Control Devices* (MUTCD) at ensuring that signs and markings were uniform in their design and placement. This promoted consistent recognition on the driver’s part, which reinforced learning and guided driving behavior. More recently, FHWA expanded the role of the MUTCD to include specific maintenance performance levels.
“Under its original mandate, the MUTCD mentioned maintaining signs and markings for ‘adequate visibility’ but didn’t really define what that was,” explains Paul Carlson, head of TTI’s Operations and Design Division. “Over the past decade, TTI has been working with FHWA to help create those minimum maintenance performance standards for properly assessing the nighttime visibility of signs and markings.”

Helping Local Agencies Improve Sign Retroreflectivity

Since nighttime crashes occur at nearly three times the rate of daytime crashes, improving visibility at night has become a national priority. To increase their visibility during nighttime conditions, signs are covered by retroreflective sheeting materials. So, how well a sign reflects light — it’s retroreflectivity value — is especially important to traffic safety at night.

“Signs typically have a lifespan of 7 to 15 years. Over time, their retroreflectivity suffers death by natural causes, so to speak,” explains Carlson.

Their number one killer? Ultraviolet light. As retroreflectivity degrades, the ability of signs and markings to help drivers navigate safely fails as well. So FHWA recently established a sequential set of deadlines by which all agencies must comply with new retroreflectivity standards for warning, regulatory and guide signs. But this could prove challenging for some since sign maintenance usually occurs at the local level — and not every community has a traffic engineer on staff.

Carlson and his team recently partnered with FHWA to determine what maintenance methods were most effective in assessing signs for replacement. Taking the needs of small cities, counties, townships, and Tribal and federal land management agencies into account, Carlson’s team created the Retroreflectivity Toolkit. It’s a step-by-step, how-to guide that empowers agencies to choose a method that best suits them and even helps them create a sample budget as they begin their maintenance planning. The toolkit, containing a guidebook and interactive CD-ROM, should be available this summer.

“The toolkit puts the procedures necessary for meeting the new maintenance standards in the hands of every small agency nationwide,” explains Matt Lupes, highway engineer with FHWA’s Office of Safety. “Lives will be saved as a result.”

But Carlson and his team haven’t stopped there. They’re currently working on a project to improve the way agencies test how effective road markings are on rainy nights.

(Re)creating the Standard for Testing Wet-Weather Pavement Markings

In 2005, Carlson’s team completed a study for the Texas Department of Transportation (TxDOT) to evaluate the testing of wet-weather pavement markings. More specifically, they evaluated the testing method recommended under ASTM International’s E 2176-01 standard. What they found was disturbing.

“When a standard test method comes out, departments of transportation around the country begin adapting their specifications based on the test method results,” says Carlson. “What we discovered was that the E 2176-01 standard test method for taking retroreflectivity measurements on rainy nights wasn’t valid for the vast majority of pavement marking materials.”

As a result, anyone using that method to test their wet pavement markings at night is likely generating data that don’t accurately reflect true nighttime wet performance. Often markings rated as “bad” using the method are actually fine. If agencies base their decision on these data, they could end up replacing markings before their time, unnecessarily increasing overall maintenance costs.

“Currently, there is no reliable standard test method for conventional pavement markings,” Carlson notes. “It’s extremely important to get a standard in place because it’s not uncommon for reflective materials to work extremely well during dry periods but poorly during rainy conditions.”

On March 24, Carlson invited his fellow ASTM International Technical Committee members to Bryan/College Station to gather data using a new standard test method created by TTI. The method is specifically designed to provide accurate measures of pavement marking performance under continuous wetting conditions. The test results have been documented and were discussed during June’s ASTM International meeting. If all goes as planned, a standard could be in place by the end of the year.

“This is a great example of how the entire nation benefits from excellent research at the state level,” explains Carl Andersen, Roadway Team Leader in the FHWA Office of Safety Research and Development. “While Paul’s TxDOT project was aimed at improving nighttime driving safety for Texans, citizens all across the country — all around the world, in fact — will benefit from the findings.”

When he discusses his work and its global impact in improving safety, Carlson is somewhat philosophical.

“That’s why I do this job. Research is interesting in its own right, but making a difference in people’s lives based on that research — now, that’s what we’re here for.”

This story first appeared in the May 2009 issue of The Road Beacon.
If you build it…TTI lab is testing facility of choice for many

In Field of Dreams people from all over the country came to a baseball field to relive their childhood fantasies of playing alongside their favorite players. The playing field in the movie was magical…but how about polluted?

Pollution is certainly a problem in the real world, and especially in our nation’s waterways. Everything from household cleaners to industrial waste can end up in our reservoirs and lakes.

The Texas Department of Transportation (TxDOT) and Texas Transportation Institute (TTI) fund TTI’s Hydraulics, Sedimentation, and Erosion Control Laboratory (HSECL), a state-of-the-art facility focused on our nation’s water quality. Other states use the facility through the HSECL Pooled Fund Project, an effort supported nationally by the Federal Highway Administration (FHWA). This project maximizes the lab’s capabilities and gives the participating states priority in using the facility and receiving test results.

“The HSECL provides the transportation industry a uniform and timely testing and research program,” states Associate Research Scientist Beverly Storey, who also heads TTI’s Environmental Management Program. “Products, materials, devices and methods used for storm water quality improvement, erosion and sediment control, and the design and management of sustainable roadsides all fall under research done at the facility, that is then shared with other state transportation agencies.”

Sediment runoff is the number one pollutant of our waterways, according to the Environmental Protection Agency (EPA). Contaminants, such as oil and gasoline, can attach to the sediment particles and be carried into water supplies by storm water runoff. During road construction, sediment retention is particularly difficult to manage, but TTI Assistant Research Scientist Jett McFalls says it is imperative that appropriate measures be taken to ensure regulatory compliance.

TTI’s facility is recognized as one of the premiere facilities of its type in the world. Since 1990, the HSECL has regularly updated the Approved Products List (APL) for erosion control materials it created in 1990. Many states, and even some municipalities such as Austin, Texas, not only utilize the APL, but also require manufacturers to have their materials tested at the facility prior to approving its use.

“The HSECL is a valuable tool for TxDOT and TTI in testing erosion control products. The lab has proven itself over time by producing reliable, meaningful data. Expanding into the sedimentation arena will continue to provide benefits for Texas and the rest of the nation.”

Dennis Markwardt, Director of Vegetation Management in TxDOT’s Maintenance Division

“For the first time, runoff at construction sites will have to meet EPA restrictions called Effluent Limitation Guidelines,” says McFalls. “Although we don’t expect the new guidelines to come out for a few years, we’ll already know which products meet those restrictions due to the new Sediment Retention Device [SRD] testing program.” The SRD test flume is the first full-scale testing program and will soon lead to an APL being developed for such devices.

“The HSECL is a valuable tool for TxDOT and TTI in testing erosion control products,” explains Dennis Markwardt, director of vegetation management in TxDOT’s Maintenance Division. “The lab has proven itself over time by producing reliable, meaningful data. Expanding into the sedimentation arena will continue to provide benefits for Texas and the rest of the nation.”

MORE INFORMATION
For more information, please contact Jett McFalls at (979) 847-8708 or j-mcfalls1@tamu.edu.
TTI Cited for Employee Support

Research Technician Lee Gustavus and Agency Director Dennis Christiansen were recognized by the National Committee for the Employer Support of the Guard and Reserve (ESGR) during a ceremony June 26.

Research Associate Chip Sosa, who is a member of the Texas Army National Guard, nominated Gustavus and TTI for the awards. “TTI and my supervisor, Lee Gustavus, have been extremely helpful and flexible every time I’ve had to fulfill my Guard duties,” Sosa said. “I feel that Lee and TTI deserve some recognition.”

Sosa is scheduled to be deployed overseas, possibly to Iraq, in October.

Former TTI employee George Dresser, who is an ESGR chairperson, presented TTI with the Above and Beyond Award and Gustavus with its Patriotic Employer Award. Dresser told those gathered at the presentation that since Sept. 11, 2001, more than 723,000 members of the Guard and Reserve have been called into active duty. And many of those have been called up as many as three times.

“It’s an easy call for us to support the men and women of the Guard and Reserve,” Christiansen said in accepting the award on behalf of TTI. “Their sacrifices ensure our freedom here at home.”


New members named to TTI Council

Three transportation professionals with an impressive range of experience have recently joined the Texas Transportation Institute (TTI) Advisory Council. They are among 36 members of the Council, providing vital advice and guidance on transportation issues and trends while supporting TTI research programs and initiatives.

The three newest members of the TTI Advisory Council are:

Mike Heiligenstein — Currently the executive director of the Central Texas Regional Mobility Authority, Heiligenstein served 23 years as a Central Texas public official, including elected positions as a Round Rock city council member and Williams County commissioner. In 2000, Heiligenstein spearheaded a $350 million transportation initiative that changed the dynamics of mobility throughout Central Texas. He previously served as chairman of the regional air quality initiative of Central Texas, called the Clean Air Force, and as a member of the air and water quality subcommittee of the National Association of Counties.

Chase Untermeyer — Currently the vice chairman for StratREAL® Asset Management (USA), which is an independent and highly specialized global real estate investment advisor and asset manager, Untermeyer was the U.S. ambassador to the State of Qatar from 2004 to 2007. He served as an executive assistant for the vice president and assistant secretary of the Navy under President Ronald Reagan and director of presidential personnel and director of the Voice of America under President George H.W. Bush. Untermeyer served in the Texas House of Representatives from 1976 to 1980 and is a former member of the Houston Port Commission.

Robert Heitmann — Currently the vice president and general manager of Zachry American Infrastructure, Inc., “the first U.S.-owned company with the capabilities to develop and invest in private-sector solutions to public infrastructure needs,” Heitmann was the vice president and general manager of Koch Performance Roads from 1996 to 2002. He has more than 25 years of experience in the development, financing, design-build and warranty of highway projects. Heitmann served as vice chairman at large for the American Road and Transportation Builders Association.

“Texas is recognized as having one of the finest multimodal transportation systems in the world, which is due in part to the work of our council members,” says Agency Director Dennis Christiansen. “With the prominence of our newest members, I’m confident that Texas transportation will surely benefit.”

The annual TTI Advisory Council meeting is scheduled for Sept. 29-30.

TDS team earns Videographer Awards

The Teens in the Driver Seat (TDS) program is adding to its list of honors with a pair of Videographer Awards for television spots now airing across Texas.

The first public service announcement, “I’m a Teenager,” features a series of teens speaking directly to the camera, relating firsthand the dangers faced by young drivers and the urgency of the issue in general. The spot was produced in both English and Spanish. The second message, “Buckle Up, Dude,” is the program’s first music video spot, addressing the lower-than-average rate of seat belt use by teens — particularly when teens are backseat passengers. Together, the two spots have aired more than 2,000 times on TV stations statewide through an agreement with the Texas Association of Broadcasters.

Considered one of the most coveted awards in the video industry, the honor recognizes efforts from network news operations, cable television, advertising agencies and a wide range of other organizations. Both of the TDS entries were recognized for their excellence.

David Martin and Clyde Hance were responsible for the shooting, editing and production of the projects, with production assistance from Morgan McKay, Krizia Martinez, Llubia Corella, Shawna Russell, Sam Holland, Jen Ross, Richard Cole, Russell Henk and Bernie Fette.
TTI innovators honored by Texas A&M System

Six employees from the Texas Transportation Institute’s (TTI’s) Roadside Safety and Physical Security Division have received an Innovation Award from The Texas A&M University System Office of Technology Commercialization. Gene Buth, Dean Alberson, Roger Bligh, Lance Bullard, Akram Abu-Odeh and Hayes Ross received the award during a luncheon ceremony April 9.

In addition to the Innovation Award, all six TTI recipients received a Patent Award for receiving patents in 2008. One patent was for a guardrail end terminal, and the other was for their design of a crash cushion. One of the roadside safety products is nearing production, and the other is in the development stage.

In addressing the audience, A&M System Chancellor Mike McKinney said the System is committed to achieving excellence in research and developing ideas to benefit public health. “That is why this annual event is very important to me. When an individual, or a team of individuals, does innovative work that brings great credit to our universities and our university system, it deserves recognition.”

TTI contributes to Texas Almanac

Since 2000, the text for the aviation section of the Texas Almanac has been the work of Texas Transportation Institute (TTI) Associate Research Scientist Jeff Borowiec. He has recently submitted information to the publishers for the 2010-2011 edition.

“It is a big honor to supply information to the Texas Almanac and its section on Texas aviation,” Borowiec says. “The publishers realize that aviation is extremely important to the economy and history of the state, thanks to its 61,943 jobs and total economic output of almost $9 billion.”

The Texas Almanac was first published in 1857, 21 years after Texas won its independence from Mexico and only 12 years after it became a state. It is currently published biannually.

TTI researcher launches Career Academy to aid construction business

In what could become the standard for training women and minorities for the state’s road construction business, the Texas Transportation Institute (TTI) is heading up a new two-week program called the Texas Construction Career Academy funded by the Federal Highway Administration’s Office of Civil Rights.

The innovative program will teach the basics of highway construction to create a pool of entry-level women and minority employees for eager contractors.

“For years now, despite the federal requirements, most construction companies have been unable to attract or retain qualified minority and female employees,” says Associate Research Specialist Debbie Jasek, a member of TTI’s Center for Professional Development. “In many cases, women often quit their construction jobs soon after they’re hired. In part, the Texas Construction Career Academy will act as a screener to find the people who are suited for this type of work.”

Masad receives 2009 Halliburton Professorship

Texas Transportation Institute (TTI) Researcher and Associate Professor of Engineering Eyad Masad is the recipient of the Halliburton Professorship Award, which specifically honors those that excel in both research and teaching.

Masad, who is a faculty member of Texas A&M University at Qatar, received a plaque and a $2,500 award. “This is a prestigious award from the Dwight Look College of Engineering, and I am honored by this recognition,” Masad said.

A reception and dinner in Masad’s honor was held April 23 at the Miramont Country Club in Bryan, Texas.
**TTI Helps Family Build a House, Find a Home**

When the Texas Transportation Institute (TTI) adopted Habitat for Humanity last year for its annual charitable campaign, TTI employees knew they would be helping a family in need. That certainly happened, but no one knew the profound impact their involvement would have on...themselves.

On June 20, TTI Executive Associate Director Bill Stockton handed over the house keys to a “too moved to speak” Jennifer Whittine, who relocated to Bryan with her family when her Louisiana home was destroyed by Hurricane Katrina.

About 40 employees had worked on the Whittine home while it was under construction. The Institute also raised $8,800 for the Bryan/College Station Habitat for Humanity effort. (Similarly, employees in each of TTI’s urban offices helped their local Habitat for Humanity programs.) Employees also donated pantry items, which were placed inside the Whittine home prior to the ceremony, completely filling the pantry and much of the cabinet space.

The Habitat for Humanity’s home dedication was designed to thank the numerous businesses and volunteers who had a role in building the new home. It was move-in day, and the Whittines would finally have a home of their own; largely built with the compassion of a community.

As Jennifer Whittine headed to the microphone, only a few phrases could be understood through the sobs and the tears: “truly overjoyed” and “blessing to be a homeowner.” One of her daughters was able to take over, saying, “Thank you for all you have done for us. It is truly a blessing.”

The outpouring of appreciation had many in the crowd wiping away tears, too.

“Based on what we’ve seen today, I really think Habitat for Humanity will be a part of TTI from now on in some way or another,” Stockton said. “It’s been a blessing for us to be involved in this.”

“In her remarks, Jennifer Whittine talked about blessings and how Habitat has changed her life,” said Melissa Tooley, co-chair of the TTI committee overseeing the project. “To be honest, those of us who participated in the dedication ceremony were blessed every bit as much just to be a part of it. I am so proud and grateful to be a part of an organization that makes such a difference within our community.”

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**Carlson, Hawkins singled out for safety**

Two Texas Transportation Institute (TTI) researchers have received national recognition for their work on the Federal Highway Administration’s (FHWA’s) Retroreflectivity Team. Head of the Operations and Design Division Paul Carlson and Associate Professor/Research Engineer Gene Hawkins were recipients of Outstanding Service Awards “in recognition of outstanding dedication and commitment toward improving the safety and visibility of America’s highways.”

Carlson and Hawkins have worked with the FHWA Retroreflectivity Team since 1999. The researchers were instrumental in obtaining a new standard for traffic sign retroreflectivity, which is now included in the *Manual on Uniform Traffic Control Devices* (MUTCD). The team received a Secretary’s Transportation Safety Award for its work on the new standard during ceremonies in Washington, D.C.

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**Habitat for Humanity**

Jennifer Whittine (right) could barely speak during the dedication ceremony of her new home.

Bill Stockton gets a hug after handing over the house keys to Jennifer Whittine.

Paul Carlson (back row left) and Gene Hawkins (front row left) pose with other members of the FHWA Retroreflectivity Team during the award ceremony.
WEB PAGES

TEXAS TRANSPORTATION INSTITUTE
Publications

TECHNICAL REPORTS


“Application of Imaging Technology to Improve the Laboratory and Field Compaction of HMA,” by Eyad Masad, 0-5261-1, April 28, 2009.


“Development of Measures to Improve Field Performance of Retroreflective Raised Pavement Markers,” by Yunlong Zhang, 0-5089-1, April 6, 2009.


“Driver Response to Delineation Treatments on Horizontal Curves on Two-Lane Roads,” by Sue Chrysler, 0-5772-1, May 19, 2009.


“A Guidebook for Effective Use of Incident Data at Texas Transportation Management Centers,” by Praprut Songchitrunka, 0-5485-P2, April 3, 2009.


“Prototype ROW Data Architecture,” by Cesar Quiroga, 0-5788-P1, May 14, 2009.


“A Guidebook for Effective Use of Incident Data at Texas Transportation Management Centers,” by Praprut Songchitrunka, 0-5485-P2, April 3, 2009.


“Prototype ROW Data Architecture,” by Cesar Quiroga, 0-5788-P1, May 14, 2009.


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