

Researcher

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BRINGING SAFETY HOME



ON THE COVER: Keeping our communities safe is at the heart of many of the Texas Transportation Institute's research projects.



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Researcher

A PUBLICATION OF



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Moving toward a CULTURE OF SAFETY

Motor vehicle crashes are the leading cause of death for citizens from 4 to 34 years of age. Even though progress has been made in the reduction of traffic fatalities in this and other age groups, many in the traffic safety community believe that we may have reached the point of diminishing return in terms of resources expended versus lives saved.

Conventional wisdom is that successful engineering, enforcement and emergency medical measures are the most efficient ways to save lives, producing great reductions in crash losses for the resources invested. In the future, such reductions will be unlikely unless there is a significant change in the way in which the driving public views driving risk. Such a change would require a change in the tolerance of current levels of driving risk by individual drivers and a change in the acceptability of risk-taking behaviors in others. In short, significant future reductions in crash losses depend on a paradigm shift in the culture of driving behavior.

Safety culture, as a concept, has its beginnings in industry. It's an organizational approach to safety that implicitly recognizes that engineering, education and enforcement methods can only improve workplace safety to a certain extent. Additional safety improvements must come from changing the culture of the organization.

Successful application of the safety culture concepts from industry to the highway system can produce significant reductions in fatal and injury crash rates. Adaptation and implementation of safety culture concepts to the highway system require dealing with three primary groups — policymakers, current drivers

and future drivers. Elected and appointed officials need to be more aware of the losses due to traffic crashes and become strong public proponents of safe driving behavior. Existing drivers need to be convinced that changing driving behaviors will produce long-term personal and societal benefits. Future drivers need to be instilled with the social conscience necessary to not only fit in, but to help keep the system self-sustaining.

What will it take to motivate policymakers, get existing drivers to overcome a lifetime of self-directed driving habits, and train future drivers to operate in and improve the social structure of a traffic safety culture? It will take political and societal will to make a change and to sustain that change over time. Information can help with that process. Information is needed to both assess the attitudes of policymakers and existing drivers and determine how to motivate them to drive safer. It will take time to acquire information, time to change attitudes and time to change behavior. ■



APATHY
AWARENESS
ACTION



*by Robert Quinn Brackett, Ph.D.
Texas Transportation Institute
Senior Research Scientist
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Houston versus the hurricane

There's no way to be 100 percent ready for the unpredictable power of a hurricane. But three years after Hurricanes Katrina and Rita, one thing is certain — this time, Texans were better prepared.

The 2005 disaster Rita caused in southeast Texas was only amplified by the chaos of evacuation. Tens of thousands of Houstonians were stranded on the road for hours with no water and no gas. Shortly after the 2005 hurricane season ended, Governor Rick Perry formed a task force on evacuation transportation and logistics, bringing together members of many public and private agencies with the goal of finding ways to improve the evacuation process. Russell Henk, a senior research engineer with the Texas Transportation

Institute (TTI), was one member of the task force. It was Henk who first suggested that phased evacuation plans be organized and announced by zip code.

“The task force made specific recommendations that were wide ranging and included plans for a more orderly evacuation that people could understand better than past efforts,” says Henk. “From what I’ve been able to tell, the zip code plan worked well during Hurricane Ike. The color-coded maps from pre-Rita evacuation plans were not well understood by the public. But everyone knows their zip code.”

The task force consulted with the Texas Department of Transportation (TxDOT), the Department of Public Safety (DPS) and the Division of Emergency Management (DEM). It also held public hearings across the state. The feedback from these activities helped form new hurricane response strategies, including giving pets family member status that

allows them to be evacuated alongside their owners. Tailored education-outreach materials about hurricane preparedness and evacuation routes are disseminated using the new zip code approach. This information was sent with electric bills, providing a cost-effective means for giving citizens appropriate and updated information to help them protect their families. The task force, along with DEM and TxDOT, also worked with the oil and gas industry to keep evacuation routes “wet,” or supplied with gas. Buses were pre-staged and standing by to evacuate at-risk and special-needs residents. Cities receiving these individuals were ready with housing and supplies.

TxDOT developed formal contra-flow plans to prevent a standstill in the event of another mass evacuation. Dynamic message signs reminded motorists to avoid traveling to affected areas and gas stations that were low on fuel. TxDOT also refined their “buddy” district system, which matches inland districts with coastal districts to provide support personnel. In the inland districts, personnel waited on the perimeter for the storm to pass and then worked around the clock, clearing the roads for emergency personnel and families returning to survey the damage.

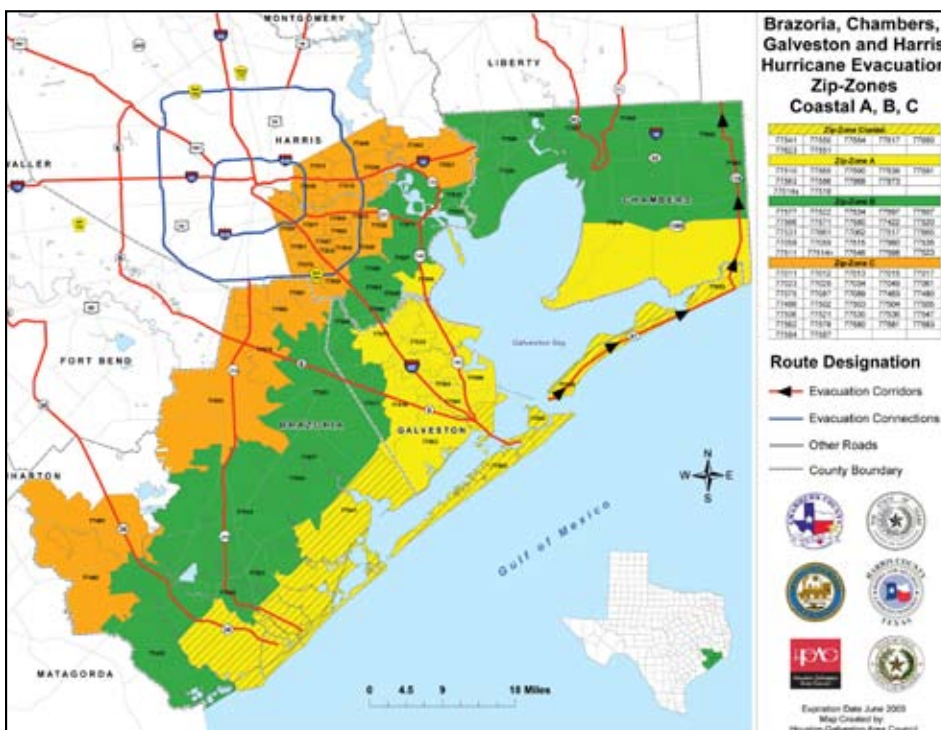
“The important thing for everyone to remember is when it’s hurricane season, be prepared,” says Carlos Lopez, traffic operations director for TxDOT. “Keep your gas tank filled, and be ready to leave or shelter in place as directed by your local officials.”

With a small break before the 2009 season begins, transportation officials have changes to consider based on the lessons learned during Ike. But the teamwork and infrastructure that made the difference will remain in place.

“The success with Hurricane Ike is a product of the good planning from the Governor’s Task Force and the hard work and cooperation among TxDOT, DPS and DEM in implementing a number of new practices,” says Henk. “TTI assisted with various planning activities.”

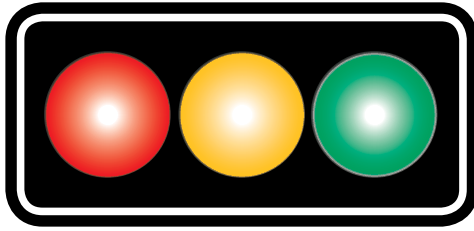
“From what I’ve been able to tell, the zip code plan worked well during Hurricane Ike. The color-coded maps from pre-Rita evacuation plans were not well understood by the public. But everyone knows their zip code.”

*Russell Henk,
 TTI Senior Research Engineer*



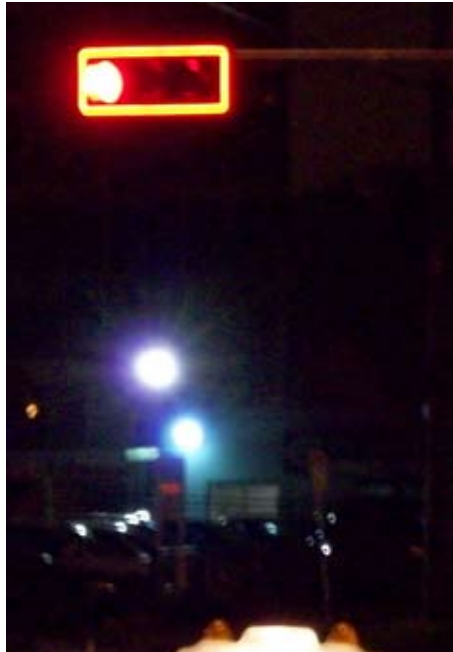
MORE INFORMATION
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The hurricane evacuation zones by zip codes for the southeast Texas coast are shown in the above map. Source: <http://www.houstontx.gov/oem/evac.html>



PAY ATTENTION!

Enhancing Visibility to Improve Safety on Houston's "Red Line"



ness of an illuminated stop bar, which is a line of red light-emitting diode (LED) lights placed in the pavement in front of the traditional white painted stop bar. The red pavement lights turn on when the traffic signal indication is solid red but are off at all other times. As an additional countermeasure, researchers evaluated the use of a red LED outline on the backplate around the traffic signal head to see whether or not drivers paid more attention to the signal with the outlined backplate in place. The red outline on the backplate is illuminated only when the traffic signal indication is red.

The research team found that the illuminated stop bars reduced right turn on red violations. The LED backplates tended to reduce red-light running a noticeable amount and reduced some of the right-turn-on-red violations as well. Researchers will conduct another year of evaluation at the original test locations before completing a final report, which will include analysis of crash data at the intersections for two years before and three years after the test devices were installed. The safety performance during night versus day will also be studied in further analysis. The five years of data provides an adequate context for evaluating the potential efficacy of the devices.

"Currently we have TTI evaluating the real-world effectiveness of these technologies, and based on their findings, it has been very effective to date," says Walter Langford, Houston METRO's senior project manager of traffic signal programs. "Once all the data is analyzed, we will use the information to proceed to the next step in the process of incorporating these items into the *Texas Manual on Uniform Traffic Control Devices* as a standardized safety device." ■



MORE INFORMATION
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TTI researchers evaluated the effectiveness of LED backplates around traffic signals.

Visitors to downtown Houston, Texas, have probably seen Houston METRO's "Red Line." It's a 7.5-mile stretch of light rail transit (LRT) that links the Central Business District with Midtown, the Museum District, the Texas Medical Center and Reliant Park. What visitors might not have noticed is how some motorists seem to ignore vehicle-train safety.

A number of crashes have occurred on the Red Line involving passenger and light-rail vehicles, with one crash resulting in a fatality. Since driver distraction and inattention seem to be contributing factors to the crashes, Houston METRO and the Texas Transportation Institute (TTI) are evaluating technologies that could make those crossings safer.

"This is a three-year evaluation designed to test technologies that supplement standard traffic control devices at the LRT crossing. The goal is to reduce the kinds of driver behavior that may lead to crashes," says Tony Voigt, program manager for TTI's Houston Office for Research and Implementation. "If we can help drivers pay better attention to what the signals, signs and pavement markings are already telling them, we can help keep drivers, pedestrians and transit riders safer."

Houston METRO asked TTI to assist them in evaluating technologies that help prevent motorists from creeping into the LRT grade crossing, running red lights or making a right turn on red onto Main Street, a prohibited maneuver. The Federal Highway Administration (FHWA) requires properly assessing the effectiveness of these technologies as part of its experimental approval process.

"We looked at red-light running because it can correlate to the potential for crashes at those intersections," explains Associate Transportation Researcher Jonathan Tydlacka, TTI's key technical expert on the project. "If we can identify technologies to help reduce red-light running, in theory the number of crashes would likely come down as well."

Specifically regarding the encroachment issue, TTI evaluated the effective-

Texas Safe Communities

National results begin at home

You're driving down your neighborhood street, maybe past an elementary school where parents are picking up their kids. You're conscientious and slow down, even beyond the school zone speed limit. And you notice the dangers — children crossing the street between parked cars, several drivers competing for one parking space closer to the front of the school and too few crossing guards to manage the chaos. Shouldn't someone do something about this situation?

Now, maybe you can.

"Safe Communities" is a program that partners grassroots interest with local, state and federal support to help improve transportation-related safety in local areas. The National Highway Traffic Safety Administration (NHTSA) has made a commitment to work with cities and towns through its Safe Communities Service Center, which provides information to Safe Community coalitions around the country. Armed with tools, strategies and the desire to make a difference, small,

medium and large U.S. cities are effecting positive change at the local level. The Texas Department of Transportation (TxDOT) is implementing NHTSA's vision in the Lone Star State, with the assistance of the Texas Transportation Institute (TTI) in coordinating existing and new traffic safety coalitions.

"Texas Safe Communities takes the program pioneered by NHTSA and puts it into action in towns as diverse as College Station and Dallas," explains TTI Assistant Research Specialist Irene Rodriguez, who serves as coordinator for the Safe Communities effort in Texas. "Essentially, we serve as an information clearinghouse for advocates who want to make transportation safer in their own little corner of the world."

Rodriguez sees her main role as being an advocate for the advocates — getting the word out to city planners, engineers and concerned citizens who simply need specific information on how to make things happen locally. The new Texas Safe Communities website will be launched in the spring and will serve as a portal for positive change.

The site will consist primarily of resources that local safety proponents can use to plan, develop and implement improvements. Success stories from other communities, news related to Safe Communities issues and instructions for applying directly to TxDOT for funding will also be available.

Set in the context of NHTSA's larger mission, it's easy to see why the efforts of individual champions at the local level are so important. It's one thing to create safety standards and distribute them for implementation and enforcement. It's quite another to make effective change for the better.

"The key to success for this program is the ability of coalitions, partners and agencies to share best practices. Also, active participation and commitment by top community officials and a plan that outlines highway and traffic safety priorities and activities for the community are essential," explains Chris Willrich, Safe Communities program manager in the Traffic Safety Section at TxDOT. ■

"Texas Safe Communities takes the program pioneered by NHTSA and puts it into action in towns as diverse as College Station and Dallas. Essentially, we serve as an information clearinghouse for advocates who want to make transportation safer in their own little corner of the world."

*Irene Rodriguez,
TTI Assistant
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Safer routes, healthier kids

A generation ago, the typical morning routine for school-aged children involved eating a hearty breakfast around the table, and then bounding out the door with books in tow to either walk or ride a bike to school. Along the way other children in the neighborhood joined in, transforming the walk into a lively neighborhood promenade. My, how times have changed.

Today, in part because of safety concerns and changes in school locations, most kids are driven to school or ride a bus. This trend has resulted in increased obesity rates, snarled congestion and worsening air quality levels around schools. The Texas Department of Transportation (TxDOT) is teaming up with the Texas Transportation Institute (TTI) to implement more Safe Routes to School (SRTS) programs in Texas schools. SRTS is a national program that encourages and enables more children to safely walk and ride their bicycles to school.

“Forty years ago, about 50 percent of children either walked or rode their bike to school compared to just 15 percent today,” says TTI Research Scientist Melissa Walden. “The goal of Safe Routes to School is to reverse this steep decline by helping local communities through outreach and education.”

According to the Texas Department of State Health Services, the costs attributed to obesity for 2001 were estimated at \$10.5 billion and are projected to reach \$15.6 billion by 2010. Approximately 35 percent of Texas school-age children are overweight or obese.

TTI is assisting TxDOT by developing outreach materials that include an SRTS guidebook designed for concerned parents and school administrators. TTI

is also developing and maintaining a website with information on all the available SRTS programs. Working with TxDOT, TTI also coordinated a training course held in Austin last September.



TTI Senior Administrative Coordinator Michelle Hoelscher also coordinates the Texas State Network. The objective of the SRTS State Network is to set goals, share best practices, secure funding and provide educational materials to agencies that

implement SRTS programs. Texas is one of 10 states involved with the SRTS state network project.



A guidebook and website for concerned parents and administrators are currently under development. Visit SafeRoutes-Texas.org.

“The number of overweight children in the United States has tripled in the last 30 years, just as children’s activity levels have dropped,” says Scott Gee, M.D., prevention and health information medical director for Kaiser Permanente in Northern California. “An hour a day of walking can help prevent childhood obesity, and Safe Routes to School has demonstrated success nationally and internationally in creating safe, convenient and fun opportunities for children to bicycle and walk to and from school.”

For more information on Safe Routes to School programs available for your school, please visit SafeRoutes-Texas.org.



MORE INFORMATION
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SCHOOL ZONES AS SAFETY ZONES:

Helping motorists reduce speeds near schools



“Now we have research that says speeds increase as you drive through the school zone. If you have a 1,000-foot school zone, that doesn’t mean you will have the same speed throughout the entire 1,000 feet.”

*Kay Fitzpatrick,
TTI senior research engineer*

SCHOOL SPEED LIMIT 20. That’s one sign we’re all likely to pay attention to. But those who don’t may potentially put children at risk.

Some may think that making school speed zones longer is the answer. Or maybe it’s flashing lights or a lower speed limit. To find the answers, the Texas Transportation Institute (TTI) conducted a two-year research project for the Texas Department of Transportation (TxDOT).

“We took a closer look at how and where TxDOT installs school speed zones,” says Kay Fitzpatrick, TTI senior research engineer. “We looked at what the different TxDOT districts were doing, as well as what other states were doing.”

Researchers also gathered speed data at 22 sites in Texas. They used the data to create relationships among the posted speed of the school zone, the length of the school zone, the amount of time the school zone was active and the actual speed of vehicles in the school zone.



SAFETY BY DESIGN

In a related research project, TTI examined the design of roadways within and around schools, as well as the location and design of the schools themselves. Part of TxDOT's design process is to review school site plans and make recommendations prior to construction. TTI helped the agency fulfill this task by creating *Traffic Operations and Safety at Schools: Recommended Guidelines*, which can be used with the Precious Cargo Program. The document is a set of guidelines for good design, with examples of problem areas and some best practices that could improve them.

For example, at one school the queue of vehicles waiting to pick up students spilled onto the local roadway, causing traffic problems in the area. By setting the school further away from the roadway or changing the configuration of the queue waiting area, the school has a greater storage capacity for those vehicles. Vehicles don't block the roadway, alleviating congestion and reducing the potential for crashes. Separate access facilities for buses, parents and pedestrians/bicyclists can also reduce conflicts.

The guidelines, available at <http://tti.tamu.edu/documents/4286-2.pdf>, include information about

- site selection;
- general site requirements and design;
- bus-related design and operations;
- parent drop-off/pick-up zones;
- bicycles/pedestrians;
- driveways;
- turn lanes;
- traffic control, signing and pavement markings; and
- parking requirements and design.



The results of a recent two-year research project yielded a set of guidelines for traffic control near schools.

The research team evaluated the various techniques and developed guidelines for traffic control near schools. “The guidelines give us more detail

on what devices and techniques work best for school zones,” says Omar Madrid, the TxDOT project director. “It will help us make school zones uniform and provide guidance for more effective traffic control designs.”

For example, transportation agencies may feel local pressure to install more speed zones around schools, or to extend the speed zones over a longer area or time period. These approaches may not be the most effective techniques, however.

“Now we have research that says speeds increase as you drive through the school zone,” says Fitzpatrick. “If you have a 1,000-foot school zone, that doesn't mean you will have the same speed throughout the entire 1,000 feet.”

Research showed that average speeds increase one mile per hour for every 500 feet driven. A longer school zone would produce more variability in actual

driving speeds. School zones may not even be necessary if there are already signalized intersections or stop signs in place to stop traffic so school children can cross the

street. The research also showed that the “buffer zone” is unique to Texas. The buffer zone begins with a school warning sign and ends with the school speed limit sign, transitioning into the actual school speed zone. The guidelines give more definition for the use of these buffer zones.

With solid research behind the guidelines, transportation agencies now have better arguments for why we should manage the length and time that the

school speed zone is active. Better school speed zones should equal more people obeying the warning signs, meaning better safety for adults and children in the area. ■

With solid research behind the guidelines, transportation agencies now have better arguments for why we should manage the length and time that the school speed zone is active. Better school speed zones should equal more people obeying the warning signs, meaning better safety for adults and children in the area.



MORE INFORMATION

For more information, please contact Kay Fitzpatrick at (979) 845-9903 or k-fitzpatrick@tamu.edu.

2008 Traffic Safety Conference showcases gains, needs



Left: Steven Chealander of the National Transportation Safety Board delivers remarks during the opening session.

Top right: TTI Assistant Research Specialist Lori Gray works at the Teens in the Driver Seat booth.

Above: The Honorable David Hodges, judge in the Texas Judicial Liasion, speaks during a breakout session about impaired driving.

The inaugural gathering of traffic safety professionals, policymakers and practitioners was a rousing success, according to John Mounce, director of the Texas Transportation Institute's (TTI's) Center for Transportation Safety. Mounce moderated the conference.

The 2008 Traffic Safety Conference was held in Houston, Texas, Nov. 17-19, 2008. TTI hosted the event in conjunction with the Texas Department of Transportation (TxDOT) and the Houston-Galveston Area Council.

"We achieved our primary goal of bringing together various constituencies devoted to reducing fatalities on our highways," explains Mounce. "Everyone at that conference was, in some way, a problem solver."

The conference began with a video on crashes designed to show just how important getting the word out about traffic safety is. A recurring theme throughout was the importance of education and increased awareness in motivating individuals to take responsibility and help create a "safety culture" on the roadway. This term refers to an emerging philosophy that acknowledges the idea that engineering innovations and law enforcement

can only do so much to keep drivers, pedestrians and riders safe. What is ultimately needed is a change in the way we, as individual users of the transportation system, view and use the system itself.

Speakers addressed a myriad of traffic safety issues, including impaired driving, motorcycle safety, young drivers, law enforcement, federal initiatives, alcohol/drug traffic offender adjudication, red-light camera enforcement, occupant protection issues for Texas and various emerging traffic safety issues.

Carlos Lopez, traffic operations director for TxDOT, noted that Texas is the only state where traffic deaths



Left: Jack Hanagriff of the Houston Police Department takes questions during his presentation.

Below: Steven Polunsky, a member of the Senate Transportation and Homeland Security Committee, speaks while Jim Murphy, a member of the House Transportation Committee, looks on.



Above: TTI Associate Research Scientist Laura Higgins speaks with Tom Lambert of METRO.

Right: TTI Associate Research Scientist Patty Turner leads a discussion on motorcycle safety.

have actually declined five years in a row, even though the state's population jumped from more than 20 million to more than 23 million between 2001 and 2006. Yet motorcycle-related fatalities have increased dramatically, as noted by Dr. Jeff Michael of the National Highway Traffic Safety Administration. Speaker after speaker noted that there is clearly room for improving safety in the Lone Star State, and motivating individual behavioral change is key to making that happen.

Texas State Representative Jim Murphy, member of the House Transportation Committee, spoke in the final session, devoted to state legislative issues. He reviewed the legislative agenda for 2009 and discussed the political realities that surround implementing safety solutions. Sometimes it's not technical knowledge or even political will that's the driving force in improving traffic safety. Sometimes it's the "power of persistence" of the public in setting

safety as a priority through legislation that really drives it forward.

"Many attendees, from many professions and levels of responsibility, were very complimentary of the forum and information shared here," explains Mounce. "Based on the attendance and responses from attendees, I believe the next conference will be even more successful." ■

Hazmat on the move

In June 2004, a chlorine spill from a rail tank car caused three deaths in San Antonio. While other similar incidents have occurred around the country, railcars are still the primary method for transporting this chemical used by water treatment plants to make drinking water safe. In order to address concerns about hazardous materials (hazmat) carried by rail, some people suggest building rail or highway bypass routes, while others recommend using existing routes outside of populated areas.

Since 9/11, the spotlight on safety has intensified for all modes of transportation. Government officials better understand that hazmat can pose a danger to citizens, whether through accidental or intentional means. With this in mind, the Texas Department of Transportation (TxDOT) is researching ways to reduce the health, safety and environmental risks of hazmat movements.

A Route Less Traveled

Texas Transportation Institute's (TTI's) Jeff Warner, an associate transportation researcher for the Multimodal Freight Transportation Program, leads one TxDOT project. His team's research focuses on effectively managing the movement of hazardous materials.

"Hazmat moves safely every day by all modes. The potential for a catastrophic event makes it an important issue, but there are solutions to minimize the opportunity for a major disaster and improve the overall safety," says Warner. Still, periodic crashes and derailments keep communities concerned.

The TTI research team will provide guidance materials that can be used by all groups involved in making these decisions, from the local community to the transportation planner to

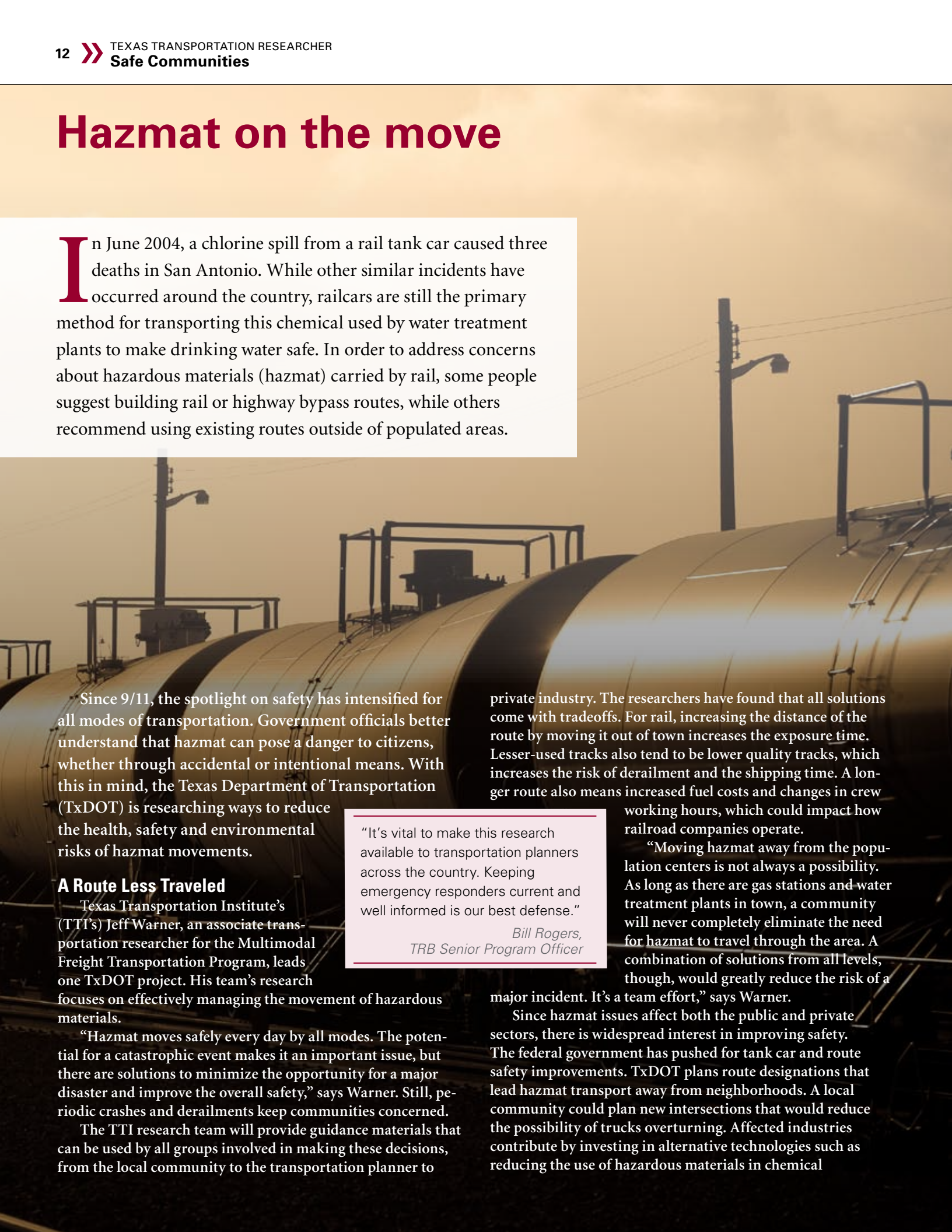
private industry. The researchers have found that all solutions come with tradeoffs. For rail, increasing the distance of the route by moving it out of town increases the exposure time. Lesser-used tracks also tend to be lower quality tracks, which increases the risk of derailment and the shipping time. A longer route also means increased fuel costs and changes in crew working hours, which could impact how railroad companies operate.

"Moving hazmat away from the population centers is not always a possibility. As long as there are gas stations and water treatment plants in town, a community will never completely eliminate the need for hazmat to travel through the area. A combination of solutions from all levels, though, would greatly reduce the risk of a major incident. It's a team effort," says Warner.

Since hazmat issues affect both the public and private sectors, there is widespread interest in improving safety. The federal government has pushed for tank car and route safety improvements. TxDOT plans route designations that lead hazmat transport away from neighborhoods. A local community could plan new intersections that would reduce the possibility of trucks overturning. Affected industries contribute by investing in alternative technologies such as reducing the use of hazardous materials in chemical

"It's vital to make this research available to transportation planners across the country. Keeping emergency responders current and well informed is our best defense."

*Bill Rogers,
TRB Senior Program Officer*



processing, developing less toxic chemicals and using ultra-violet lighting instead of chlorine to treat water.

“The guidebook will expand on the findings from the HB 160 report and provide local governments a valuable resource for hazardous material regulations, guidelines and potential strategies for managing hazardous material transportation in their communities,” says Jennifer Moczygemba, P.E., multimodal section director of TxDOT’s Transportation Planning and Programming Division.

Piecing Together the Big Picture

One tool for communities to use is a commodity flow survey, which traces the routes through which products move through a community.

TTI has steadily increased research into hazmat management since the 1990s. Researchers are currently working with faculty from Texas A&M University’s Department of Landscape Architecture and Urban Planning on the project “Hazardous Materials Commodity Flow Data and Analysis,” funded through the Transportation Research Board’s (TRB’s) Hazardous Materials Cooperative Research Program.

As part of a community’s emergency management plan, hazmat commodity flow surveys help assess the risk of hazmat travel — whether by highway, rail, pipeline or waterway — through a populated area.

“The objective of the research is to update a 1995 guidebook written by the U.S DOT that can be used by local emergency planning committees (LEPCs), state emergency response commissions or private companies,” says George Rogers of Texas A&M’s Department of Landscape Architecture and Urban Planning. “We’re putting together steps that LEPCs can use to manage and reduce risk before an incident — changing the routes, the scheduling, how it’s being handled in accident-prone areas — and steps for after the fact, such as response training.”



A large truck carrying hazardous materials drives slowly along a heavily congested corridor.

But funding barriers have prevented some communities from conducting hazmat commodity surveys. LEPCs are typically made up of dedicated volunteers, and the large majority of them have little-to-no consistent funding base. Hazmat commodity flow surveys are typically conducted by local communities using funds from federal Hazardous Materials Emergency Preparedness grants, which require a non-federal match.

“While doing these types of studies may seem challenging for LEPCs, there are ways they can make the project easier, obtain needed funding and involve the community,” says David Bierling, assistant research scientist for TTI’s Multimodal Freight Transportation Program. “The guidebook provides one tool to aid emergency response planners in understanding hazmat transport.”

With ever-changing technology, research projects like these will help communities better understand and manage hazardous materials transportation. “It’s vital to make this research available to transportation planners across the country,” says Bill Rogers, TRB’s senior program officer. “Keeping emergency responders current and well informed is our best defense.”

“Hazmat moves safely every day by all modes. The potential for a catastrophic event makes it an important issue, but there are solutions to minimize the opportunity for a major disaster and improve the overall safety.”

*Jeff Warner,
TTI Assistant
Research Engineer*



A tanker ship docked at a port.



MORE INFORMATION

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Walk, bike and be counted:

Automated sensors are watching out for you

Take a walk down most busy urban streets and you'll see any number of traffic devices to help keep pedestrians and bicyclists safe — pavement markings, crossing signals and warning signs. What you don't see is what goes on behind the scenes.

Several traffic safety devices need sensors that can detect pedestrians and bicyclists reliably and accurately. The effectiveness of these safety measures depends on how well the sensors actually work. Recently, researchers at the Texas Transportation Institute (TTI) developed a real-world test bed to evaluate pedestrian and bicyclist sensors, with funding from the Southwest University Transportation Center.

Intersection-Based Sensors

At some intersections, pedestrians can push a button, which tells the signal controller to provide a walk signal. With accurate sensors, pedestrians wouldn't even have to do that.

Detecting a pedestrian, the signal controller could give the walk signal and even extend the pedestrian walk time, which would be especially useful for people who walk slower than average, such as the physically disabled and the elderly. The signal controller could also provide an advance warning to pedestrians or motorists of potential conflicts.

TTI Research Engineer Dan Middleton worked on the project with Research Engineer Shawn Turner. "A more important application of the sensors is at places where there are no signals, such as at a crosswalk or unsignalized intersection," says Middleton.

"On a busy street, a pedestrian will wait for a gap. But the longer the pedestrian waits, the more likely he or she is to take more risks and start the crossing in a short gap of traffic."

At these areas, sensors can trigger flashing beacons to warn motorists that pedestrians are in the crosswalk or intersection. Motorists would have time to slow down and stop for pedestrians, especially in high-speed areas.



A runner on the pedestrian bridge in Austin passes by a trail counter attached to a post.

Trail Counters

Transportation agencies need data on the number of pedestrians and bicyclists using crosswalks, sidewalks, paths and trails. Traffic counts can tell them the potential crash exposure for a given trail and if the trail needs further safety enhancements.

"If agencies make improvements, they want to be able to show that fewer people are getting injured," says Turner. "However, once the improvement is in place, more people may be using the trail because they feel safer. Just looking at the number of crashes before and after an improvement can be misleading. We need to look at the crash rate, which accounts for more (or fewer) people crossing the street after the improvement."

With the current emphasis on promoting alternatives to vehicle travel, especially modes that have less of an impact on the environment, agencies are taking a closer look at including pedestrians and bicyclists in their transportation plans.

"We need to study walking and bicycling in the same way we study vehicles," says David Ragland, the director of the Traffic Safety Center at the University of California-Berkeley, who is also doing research into the pedestrian and bicycle modes of transportation. "We have a set of requirements in place to measure vehicle volumes, and we need the same for pedestrian and bicycle counts. Those measurements are used for resource allocation, as well as risk assessment and planning."

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*David Ragland,
 Traffic Safety Center
 Director, University of
 California-Berkeley*



MORE INFORMATION

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Tracking trends:

Planning for air solutions, not pollution

As the old saying goes, you shouldn't compare apples to oranges. But sometimes evaluating them together can yield interesting information about fruit in general — as long as there's a valid way to accurately assess the two relative to one another.

Each of Texas' 254 counties is different from the others, from highways to air quality. To protect the public health, the Federal Clean Air Act requires the Environmental Protection Agency (EPA) to set limits on the amount of certain air pollutants. Air pollution can cause various health threats, from simple throat inflammation to respiratory and cardiovascular disease. Areas that exceed EPA standards are said to be in "nonattainment." These areas risk losing federal funding if they fail to demonstrate compliance within a given period of time.

The Texas Commission on Environmental Quality (TCEQ) is responsible for ensuring that Texas meets EPA standards, but until now, the agency had no way of reliably tracking air quality trends across the state. To support TCEQ, the Texas Transportation Institute (TTI) has created a first-of-its-kind methodology that allows the direct comparison of Brewster County, in arid West Texas, to Orange County on the mouth of the Sabine River.

"With the tool developed by TTI researchers, TCEQ can identify mobile source air quality trends that are county specific but methodologically consistent," explains Dennis Perkinson, program

"These analyses of long-term trends support a proactive approach to air quality management that can help preserve the environment and protect public health, from Houston to Wink, Texas. Small towns and big cities — everyone wants clean air."

*Dennis Perkinson,
TTI Program Manager*

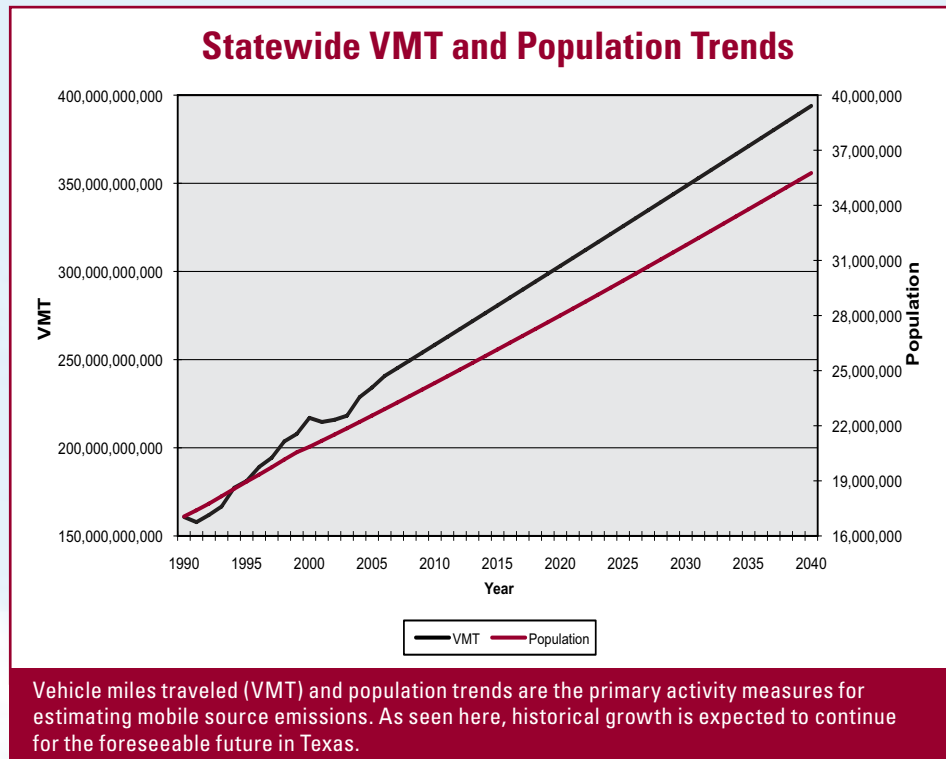
manager for TTI's Transportation Modeling Program. "In short, our model allows the agency to project the potential pollution in a specific county and then compare that county with others statewide." TTI created the methodology to cover all counties, whether they're currently in nonattainment or not. The model covers 50 years, from 1990 to 2040, to capture data from both the early emissions control programs and the expected effects of new vehicle standards, as well as growth in the number of vehicles on the road. Researchers rely on actual or estimated vehicle miles traveled (VMT) as the primary activity measure for making predictions of on-road mobile source

emissions. For future analysis years, VMT becomes a function of historical VMT and the population projections supplied by the Texas State Data Center.

"These analyses of long-term trends support a proactive approach to air quality management that can help preserve the environment and protect public health, from Houston to Wink, Texas," says Perkinson. "Small towns and big cities — everyone wants clean air."

The real value of the methodology is that it provides consistent estimates, which means better analysis is possible on a larger scale. And better analysis can lead to smarter policies for the Lone Star State.

"It is our hope that this analysis will make it easier for TCEQ to examine the big picture of air quality throughout Texas," says Perkinson. ■



MORE INFORMATION
For more information, contact Dennis Perkinson at (979) 862-4926 or d-perkinson@tamu.edu.



The historic relationship between Texas Transportation Institute and the Texas Department of Transportation (TxDOT) was the focus of Agency Director Dennis Christiansen’s remarks to the 82nd Annual Transportation Short Course, Oct. 14-15, held at Texas A&M University.

“The universities in this state take great pride in the relationship we have with TxDOT,” Christiansen, the Short Course co-chair, told this year’s 2,200 attendees. “The vision expressed by Mr. Greer [Dewitt Greer, longtime engineer-director of the department] in the 1940s — that the universities should be valued partners with TxDOT in building the best and safest system of roadways in the country — has long been a reality.”

Christiansen cited the 1948 cooperative agreement between TxDOT and the universities, which established the longtime research relationship. “This

document, now celebrating its 60th anniversary, remains the envy of the nation,” he said. “It created a research program that, according to TxDOT statistics, produces results with a benefit/cost ratio well in excess of 5 to 1.”

Christiansen told the crowd that having the TxDOT family as guests on campus “is one of the high points of our year.”

The opening session began with an uplifting, team-spirited video of TxDOT’s work during Hurricane Ike, which hit the Texas coast Sept. 12. The video chronicled the massive TxDOT preparation and cleanup efforts by employees in dealing with the challenges of the third-most expensive hurricane in the nation’s history. The video was followed by a campus welcome from Brett Giroir, vice chancellor for research for The Texas A&M University System.

In her first comments to a Transportation Short Course, newly appointed chair of the Texas Transportation Commission Deirdre Delisi spoke to the crowd in a video message. “We are on the precipice of a new era in transportation,” she said. “We cannot only keep up with, but we must exceed, expectations. Transportation is integral to the economy.” Referring to recent high rankings by publications about Texas infrastructure, Delisi acknowledged that TxDOT has been receiving some national recognition.

At the end of the session, TxDOT honored three employees with its annual “Extra Mile Award,” which is given to workers who risk their own lives to save the lives of others. The employees received standing ovations following details of their heroic efforts. All TxDOT award winners were honored at a luncheon following the opening session. Among the special guests participating in the luncheon were Texas A&M University System Chancellor Mike McKinney and his wife, Lou Ann, and Kem Bennett, vice chancellor and dean of engineering. ■

“We are on the precipice of a new era in transportation. We cannot only keep up with, but we must exceed, expectations. Transportation is integral to the economy.”

*Deirdre Delisi,
Texas Transportation Commission Chair*

Charles J. “Jack” Keese inducted into Texas Transportation Hall of Honor

Right: Members of the Keese family and other dignitaries gather for a photo following the ceremony.

Bottom: Per a request from the Keese family, friends, family and TTI employees were treated to a barbecue.



Charles J. “Jack” Keese was inducted into the Texas Transportation Hall of Honor on Oct. 22. Keese served as the first full-time director of the Texas Transportation Institute (TTI) from 1962 to 1976.

Friends and family joined TTI staff to celebrate Keese’s contributions to transportation at the Gibb Gilchrist Building in the Texas A&M University Research Park. Following the induction ceremony, TTI staff were treated to a barbecue luncheon.

Several visiting dignitaries spoke about the life, achievements and legacy of Keese, noting how he ably led TTI during its crucial adolescent years. Created in 1950 to help the Texas Highway Department improve the state’s transportation system through research, TTI became a nationally recognized center for research excellence under Keese’s leadership.

“This gentleman set the tone and culture for this organization and is largely responsible for establishing TTI as a premiere research organization,” acknowledged TTI Agency Director Dennis Christiansen. “The jobs we have and the work environment and culture that we enjoy are, to a large extent, a Jack Keese legacy.”

Drawing on his experience as a captain in the U.S. Army during World War II, Keese established the basic organizational structure that still guides TTI today. When he retired as director, TTI employed 200 staff and 120 students with an annual budget of \$3.9 million. Training transportation professionals at Texas A&M University was also important to Keese, who received his bachelor’s and master’s degrees in civil engineering from Texas A&M. He is generally credited with

starting Texas A&M’s graduate program in traffic engineering.

Keese was also a founding member of the Texas Section of the Institute of Transportation Engineers (ITE) and served as its president. He received numerous awards during his 32-year career, including the Luther DeBerry Award, and was named as the 61st Honorary Member of ITE. He also received a Purple Heart for his military service.

Speaking on behalf of the family, Joe Keese let those in attendance know that working at TTI “was not a career, it was not a job, it was a passion for my father. His inclusion in the Texas Transportation Hall of Honor is truly a great honor for our family.”

The induction ceremony took place only a few hundred feet from the Gilchrist’s sister building, currently under construction and scheduled for completion next fall. The new building will serve as TTI’s state headquarters.

“The new state headquarters building is, in large part, a tribute to the blood, sweat and tears Jack Keese put into this organization,” says Christiansen. “TTI is the world-class research agency it is today because of his vision and dedication to educational excellence.”

Keese joins a select group of fellow pioneers in the Hall of Honor, all of whom played pivotal roles in the advancement of transportation in Texas and the nation. In November, two additional 2008 inductees were also honored in Austin: Marquis G. Goode, Jr., and Louis L. Heil. The Hall of Honor is overseen by a five-member board of senior transportation professionals. ■

Briaud seeks top job of international society



Briaud

Next year, TTI Research Engineer Jean-Louis Briaud will learn if he will become president of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE). Briaud, a Texas A&M University Zachry Department of Civil Engineering professor and holder of the Spencer J. Buchanan Chair in Civil

Engineering, has become renowned worldwide for his work in soil mechanics and foundation engineering.

ISSMGE is an 84-member society representing 18,000 individual members. It works to promote cooperation among engineers and scientists for advancement in the field of geotechnics as well as its engineering and environmental applications. The elections will take place Oct. 4, 2009, in Alexandria, Egypt.

"It is exciting to have a chance to serve all my colleagues on the international scene, to get an appreciation of the geotechnical practice and culture in different countries and to further develop communication between countries," Briaud says. "If there are any Aggies out there with good ties to the geotechnical leaders of the member countries, I sure could use some help."

Professor Briaud developed a website (<http://ceprofs.tamu.edu/briaud/>) that details his experience and presents his vision for ISSMGE. ■

Shunk remembered for professionalism, caring

The former manager of the Urban Analysis Program at the Texas Transportation Institute, Gordon A. Shunk, died Nov. 5, 2008, after a lengthy struggle with frontal temporal lobe dementia.

Shunk's career in transportation forecasting and modeling spanned 35 years after he received his Ph.D. from Purdue University. His work included duties with the Metropolitan Transportation Commission in Berkeley, California, the North Central Texas Council of Governments (where he was director of transportation) and 13 years with TTI before retiring in 2003.

"Gordon was known for his professionalism and his ability to communicate on a very human level despite his precise, technical work," says TTI's Montie Wade, a colleague of Shunk. "Even during the time of his illness, he expressed concern about his co-workers and their well-being."

An honorarium on Shunk's behalf was held Jan. 12 at the Transportation Research Board Annual Meeting in Washington, D.C., highlighting his engineering work. ■

Visiting scholar brings China to TTI

From her home in Beijing, China, Jianping Sun travels the 8.5 kilometers to her office every day to the Beijing Transportation Research Center (BTRC) where she's worked as a mobility expert for four years. She's one of about 50 employees at the center, which was established in 2001. Her 5-mile commute takes nearly an hour each way. "The mobility in College Station is much better," she laughs.

In her first trip to the United States, Sun arrived at TTI on Sept. 6, as a visiting scholar working in the Mobility Analysis Program, alongside Shawn Turner and Teresa Qu. According to Turner, Sun is one of the first visiting scholars at TTI, "but because of our international efforts, I think we need to do this more often. These one-on-one personal interactions do a lot to foster our relationships with experts in other countries."

Agreeing, Sun says, "At BTRC, we all know of TTI. Actually being here is impressive because you have so many employees and so many fields of study."

TTI first worked with BTRC in 2006 on a congestion evaluation project, but the collaboration on several topics has continued since then. Sun hopes to work with the Institute again. "In the future, I think BTRC will be better known because of our work with TTI." She finished her work in College Station and traveled home to Beijing at the end of November. ■

TTI center to study increased waterway travel

TTI's Center for Ports and Waterways (CPW) has been selected as the contractor for a \$100,000 National Cooperative Freight Research Program (NCFRP) contract that will determine the feasibility of increasing freight traffic on our nation's waterways.

"The North American marine highway system is underutilized at a time when the nation's roads and freight systems are at near-maximum levels," says CPW Director Jim Kruse. "Increasing waterway freight transport is essential, considering that freight traffic will need to double in the next 25 years to accommodate our growing population. By shifting our emphasis to short sea shipping, it will help in numerous areas, from congestion to pollution."

The research project will evaluate the obstacles for increasing short sea shipping. In part, Kruse and his staff will produce a white paper that proposes strategies to overcome those current barriers.

CPW released a report this year for the National Waterways Foundation and the U.S. Maritime Administration highlighting the benefits of moving cargo by water. For example, barges move a ton of cargo 576 miles for each gallon of fuel expended. That's a much better average than railroads (413 miles) and trucks (155 miles). ■



Mobility researcher Jianping Sun is one of the first visiting scholars at TTI.

TDS Summit showcases teen driver safety

In the first Teens in the Driver Seat (TDS) Summit, the peer-to-peer education and outreach program included 48 different schools from 35 cities. With 200 attendees, the Oct. 24-25 summit in San Antonio highlighted students and their accomplishments in presentations, breakout sessions and video interviews.

"I think the summit hit a home run," TDS Director Russell Henk said afterward. "Many of the teenagers said they were grateful that the event and the TDS program gave them a voice on this issue...something they say they are not used to, but are excited about and very much welcome."

TDS is a TTI-developed program that pinpoints the causes of most teen car crashes. The in-school program has grown across Texas and is now beginning in Georgia and Connecticut, with two other states considering the program for their schools.

Prior to the event, U.S. Representative Ciro Rodriguez held a press conference to announce a 27 percent decline in fatal accidents involving teen drivers in Texas from 2002 to 2006, a decline that is more than twice the pace of the national average. "Effective laws and parental involvement are essential," said Rodriguez. "But laws and parents will never be enough. We need teenagers to drive the message — just as they're doing through Teens in the Driver Seat."

Rodriguez and Maria Teresa Cerqueira of the World Health Organization, both strong supporters of TDS, were among the speakers at the summit, which was held at The University of Texas at San Antonio.



U.S. Representative Ciro Rodriguez speaks at a press conference to announce a decline in teens deaths related to driving.

The summit's breakout sessions included both adult and teenager "tracks," all specifically geared to them. HEB grocery stores and Fiesta Texas sponsored door prizes, which included iPods and tickets to the Fiesta Texas theme park.

The second annual TDS Summit will be held next year in El Paso. ■

Ike changes lives of TTI Houston, Galveston employees

When Hurricane Ike was approaching the Texas coast Sept. 11, staff members in the TTI Houston and Galveston Offices were preparing to secure their

facilities and head home to protect life and property. But for some of the 25 Institute employees at 701 N. Post Oak, it meant that work was just beginning.

In advance of the storm, Darrell Borchardt and Jonathan Tydlacka led the deployment of traffic count

equipment at almost 50 locations across the Houston region to provide traffic data along hurricane evacuation routes. To support Texas Department of Transportation (TxDOT) staff at Houston TranStar, Borchardt, Tony Voigt and Mike Vickich monitored the regional traffic sensor network as evacuations commenced.

After the storm, Vickich and Kathy Tran managed critical updates of public information to the TranStar website. At the request of TxDOT and the Harris County Office of Emergency Management, Tydlacka and the Houston Office field crew staff — including Paul Adamson and Michael Davis — transported and set up TTI's data collection trailer at Houston's Reliant Park so that emergency management personnel could remotely monitor the flow of Federal Emergency Management Agency (FEMA) supply trucks in and out of the city.

"While many of us in the Houston Office were busy boarding up our homes and preparing our families for the worst, we were also doing the best we could to continue to help our sponsors collect and disseminate traffic and emergency management information to decision makers and the public," says Voigt, program manager for the Houston Research and Implementation Office. "Ike impacted all of us in the Houston Office in various ways. Most of us sustained damage to our

homes and were without electricity for a week or so."

The basement and elevators of TTI's Houston Office building received water damage from the storm but were repaired so that employees could return to work by Sept. 22. The TTI office on the Texas A&M campus on Pelican Island reopened Thanksgiving. Two employees live in Galveston and have offices on campus. Ryan Taylor temporarily relocated to the Arlington Office. Linda Cherrington worked out of her home.

"I was one of the very fortunate," Cherrington says. "My home was not damaged, electricity came back quickly, and I have Internet access. So, I'm working as most residents here are cleaning up and trying to get their lives back to normal."

Ike also had an impact on numerous employees living in the Navasota, Somerville and Caldwell areas due to electrical outages.

For more about TTI's involvement in preparing for Hurricane Ike, see "Houston versus the hurricane" on page 4 of this issue. ■



TECHNICAL REPORTS

"GIS Models for Analyzing Intercity Commute Patterns: A Case Study of the Austin-San Antonio Corridor in Texas," by Benjamin Zhan, **0-5345-2**, Nov. 18, 2008.

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"Guidelines on Corridor Management and Preservation for Texas," by Ed Hard, **0-5606-P1**, Aug. 7, 2008.

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"Access Management Program: Processes and Benefits," by Bill Frawley, **5-4221-01-P2**, July 16, 2008.

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"PAVECHECK: Updated User's Manual," by Wenting Liu, **5-4495-01-P1**, July 15, 2008.

TTI PUBLICATIONS

A full catalog of TTI publications and other products is online at <http://tti.tamu.edu/> publications. You can find the publications by searching for either the title or publication number listed here. Most of these publications are available as free downloads in portable document format (PDF).

Printed, bound versions of these reports are also available through the URL above. Publication prices vary depending on length. The Texas Transportation Institute accepts checks, money orders and credit cards.

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