Securing Our Homeland
<table>
<thead>
<tr>
<th>HOME LAND SECURITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. From Every Angle: Engineering Homeland Security at the Texas A&amp;M University System</td>
</tr>
<tr>
<td>7. Keeping Ports Afloat</td>
</tr>
<tr>
<td>8. Working Together to Secure the Homeland</td>
</tr>
<tr>
<td>10. Didn’t See It Coming</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNIVERSITY CENTER FOR MOBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. University Center for Mobility Launches at TTI</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A TRANSPORTATION PIONEER</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. Black History and the Transportation Industry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROFESSIONAL DEVELOPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Tolling in the Americas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INSTITUTE NEWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Retirements, awards and more</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TTI PUBLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>20. Listing of reports available for sale</td>
</tr>
</tbody>
</table>
Dr. G. Kemble Bennett, dean of the Dwight Look College of Engineering, director of the Texas Engineering Experiment Station and vice chancellor of the Texas A&M University System talks about terrorism, engineering solutions to protect our citizens and the day the towers fell.

“Not in my wildest moments did I ever think Osama bin Laden would become a household name. I honestly thought we had more to fear from radical militia groups like Timothy McVeigh’s. The concern about domestic terrorism was embedded in my mind when the Murrah Federal Building was bombed in Oklahoma City in 1995. But even before that I knew the name bin Laden. He was clearly enemy number one in international terrorism, but I don’t think that fully hit me until the World Trade Center attack on 9/11. I was driving to an appointment that morning when I heard on the radio that an airplane had hit the World Trade Center. I knew immediately we were under attack. I knew without hesitation that it was terrorism.

The radio commentators were discussing that maybe a small plane had hit the building, but I knew there was no way such a thing could happen in that airspace.

Twenty minutes later I got a call asking me to standby to deploy our Urban Search and Rescue team. They’d hunted me down in my meeting.

Now almost six years later I can say, without question, we’re better prepared than we were back then—considerably better prepared.”

G. Kemble Bennett, Ph.D., P.E.
I don’t think there was much focus on homeland security before about 1995. In those days people mainly thought that terror attacks or acts of extreme violence would happen somewhere else. Then the first attempt on the World Trade Center, the bomb, served as a warning that we were being targeted. I think the people in the intelligence community and the first responders very much viewed that attack as a warning, but among the rest of the country, I don’t think it was given much thought.

Then, the Oklahoma City bombing came along. It was a domestic act of terrorism. That was a wakeup call to me and to others here at Texas A&M. We knew we were in a new era. At the time I was responsible for the Texas Engineering Extension Service (TEEX), which was training first responders, meaning fire, police and emergency medical personnel. This bombing told us, “We better get prepared to respond to new types of threats we hadn’t seen before.” We needed to focus on heavy rescue and mass casualty incidents. During that time the public really didn’t want to admit that we were being targeted and that weapons of mass destruction could be used in this country. People thought that we were being alarmist, but we pushed ahead and received federal funding from the Department of Justice to provide training for our nation’s first responders.

Then 9/11 happened. Although there were a limited number of people trained around the country to handle an emergency of that magnitude, the nation as a whole wasn’t prepared for such a massive attack. 9/11 got everyone’s attention. We realized we were at war. We faced a new type of enemy that threatened our very way of life. Before that attack, if we had talked about putting barriers around the Capitol Building in Washington or any of the security steps we now endure at airports, people would have felt it was absurd. Our whole way of life changed.

The U.S. took the attack very seriously. The Engineering Program took it seriously, too. After 9/11 Congress passed a special appropriations bill that doubled

"By having the research areas clearly focused on transportation and conducted by leaders in transportation, TTI is the natural lead to study ways of securing our national transportation system. Who better to lead that in the nation but TTI?"  

G. Kemble Bennett, vice chancellor and dean of Texas A&M Engineering
our budget and doubled our mission. And unfortunately since then, terrorism-related engineering and training has been a growth industry. With respect to funding, the first thing the government needed to do was boost intelligence funding. Next, they needed to make sure our communities were prepared for an attack with emergency equipment. We had to find ways to coordinate local, state and federal emergency responses. Then the government consolidated a number of related federal entities and agencies by creating the Department of Homeland Security.

It became clear that our engineering research program and our training programs could contribute. Shortly after the attacks, communities began getting federal money to purchase equipment for use in case of another attack. Companies cropped up everywhere to supply a plethora of emergency equipment, but there was no “Consumer Reports” these communities could use to evaluate how well this equipment really worked.

So we started to test and evaluate equipment. We created the System Assessment and Validation for Emergency Responders (SAVER) program to test equipment and to make sure first responders have functional protective gear, the right tools to disable or minimize explosives and other essential, life-saving tools.

The Texas Transportation Institute’s (TTI) transportation experience and expertise has helped study barrier systems that facilities worldwide need in order to hinder or stop attacks. Funds flowed into this area for research, but not enough. We’re now starting to see some national centers form and more focus on research and testing. Some of the funds that were in “response” have been shifted to “research.” But I think we’re still in our early years of research for homeland security.

There’s probably not an area in abundant homeland security needs for research and advancement that the Engineering Program between TTI, the Texas Engineering Extension Service (TEEX), the Texas Engineering Experiment Station (TEES) and the Look College doesn’t have a role in. We certainly make an impact.

Can you describe for us the importance of the homeland security research underway at TTI?

For years TTI’s Riverside Campus has served as an applied laboratory designed to study all areas of transportation safety, including roadway barrier designs and vehicle features. The facility is being used, for example, to test security barriers to protect facilities from terrorist attacks.

More broadly, TTI has also worked in El Paso with border security work. They’re helping answer questions like, “How do we keep the traffic flowing along the border and still monitor what might be in vehicles along the border?” The whole area of border security is a big one for Texas, which is a microcosm of the U.S. Like the U.S. we have a border that needs securing. We have ports with goods coming in from international ships and we have goods flowing in from Mexico. The border is a very important place where we can help provide national security.

The Texas Engineering Experiment Station (TEES) and the Texas Engineering Extension Service (TEEX) are providing vital, world-class, weapons of mass destruction training and first responder equipment testing programs. How well does the comprehensive partnership between these agencies and TTI or the broader Engineering Program help position Texas A&M as a leader in the fight against terrorism?

I don’t know of another engineering program in the country organized as we are. Our four entities, TTI, TEES, TEEX and the Look College of Engineering, comprise this unique engineering program. Each organization has its mission. Three are state agencies, and one is an academic college, but they’re all formed under the land grant mission of the 1860 Morrill Act. Meaning, these land grant universities were to provide services, education and research that would help citizens. Back then those schools were mostly oriented toward agriculture. Extension helped researchers share what they learned with farmers. As the country became more technical, that same model found its way into engineering. The “M” in Texas A&M stood for “mechanical,”
and today that has evolved into using technology to serve our citizens—and that’s what our research programs are about.

TTI focuses on all modes of transportation. TEES is oriented toward a broad area of other research disciplines. And TEEX carries this knowledge to the outside world through its training programs. In the area of homeland security, we have faculty looking at new sensors and new security construction techniques, and we also have applied research groups like TTI who take knowledge and put it into practice. TTI can deploy technologies to make them useful. Coupled with the faculty here and the other agencies, the power of our engineering program is the fact that agencies with different missions come together here. The sum of these agencies is stronger than any of the individual parts. By having the research areas clearly focused on transportation and conducted by leaders in transportation, TTI is the natural lead to study ways of securing our national transportation system. Who better to lead that in the nation but TTI?

Put the research of TTI, TEES, and the Look College of Engineering together with the training and outreach at TEEX, and you’ll see that the Engineering Program at Texas A&M University has amassed quite a bit of intellectual power to approach some of the major homeland security challenges our country will face.

That original 1860 mission is still alive today; we’re just looking at different problems. Homeland Security is something we need to do for our country. We can talk about lofty solutions, but the Engineering Program here also puts solutions in place where the rubber meets the road. Here we can bring teams together. We don’t have to hand off research or progress to someone else. We can “think tank” issues, and we can field test, too.

In my conversations with the Department of Homeland Security, they’re delighted with our capabilities. We’re strong because our diverse engineering components aren’t separate or disconnected.

What avenues of homeland security and safety research do you see the Engineering Program pursuing in the future?

We know we need to work on security sensors and emergency equipment to make equipment portable and reliable in all circumstances—emergency and otherwise. We’ll need to look at our infrastructure, roads and buildings, and our food supply to determine how to protect them along with communication lines and computer systems.

With TTI’s help we’ll continue to look at ways to evacuate people from disasters and develop better models to get people out of harms way. When disasters do strike or when terrorists attack we’ll have already studied, simulated, and analyzed our response. We need plans. We need to have them on hand and ready to use, and TTI is helping with that as well.

The Aggie family has always answered when our nation needed us. Through world wars and economic roller coasters Texas A&M University (TAMU) and the broader University System (TAMUS) have risen to offer the men, women and mindset necessary to tackle the challenges of the day and prepare for those yet to come. TTI would like to thank Dr. Bennett for his leadership and for sharing his views.

For additional information about the homeland security research efforts at the programs referenced in this interview, please see:

- Texas Transportation Institute
  http://tti.tamu.edu/
- Texas Engineering Extension Service
  http://www.teex.com/nerrtc/
- Dwight Look College of Engineering at Texas A&M University
  http://teeshs.tamu.edu/
- Texas Engineering Experiment Station
  http://tees.tamu.edu/
A recent study for the Southwest Region University Transportation Center (SWUTC) examined the effects of new security measures on port infrastructure development and finances. Texas Transportation Institute (TTI) researchers examined nine Texas public ports, which accounted for 88 percent of the foreign cargo moving through Texas ports in 2003. From this analysis, the team identified several policy issues at the federal level that ports face:

- how best to allocate limited funds to maximize security,
- how to distribute funds fairly so as to prevent a competitive imbalance,
- how to ensure that all ports meet a minimum level of security,
- how much financial responsibility the federal government should assume for security infrastructure,
- how the federal government and ports will deal with ever-increasing costs as more security projects are completed, and
- who will pay to replace worn-out or obsolete equipment.

“The federal government gives the ports grants to fund security infrastructure,” says Jim Kruse, the director of the Center for Ports and Waterways at TTI. “It also sets general goals for security and leaves it up to the ports to decide how they achieve those goals.”

For example, one goal may be to secure the perimeter of the port. The port may choose cameras, fences, boats, intelligent motion detectors and/or even underwater sensors. Port officials at many ports in the state express concern that the federal investment in security is not great enough to address the need. While the Port Security Grant Program pays for security equipment, it also stipulates that the ports must pay for maintenance and operation. “Anywhere from 3 to 16 percent of ports’ operating revenues go to maintenance of security measures, like normal wear and tear,” says Kruse.

The research team identified alternate security financing measures. Among the variations currently being debated and implemented are:

- Various port charges – Ports on the East and Gulf Coast have begun adding security surcharges as high as 10 percent on dockage and wharfage.
- Department of Homeland Security (DHS) appropriations – Thus far, most of the federal government’s financial participation has been through appropriations for DHS.
- Earmark customs fees – A certain percentage of duties collected on articles transported by vessel and unloaded for purposes of entering the customs territory of the U.S. could be set aside for security improvements.
- Federal security fees – Several bills have been introduced that would establish federal user fees to help offset the costs of security at the national level.

Ultimately, continuing to find ways to keep ports secure and operating efficiently can only strengthen Texas’ homeland security efforts.

For more information, please contact Jim Kruse at (713) 686-2971 or j-kruse@ttimail.tamu.edu.
Texas A&M Engineering is composed of the Texas Transportation Institute (TTI), Texas Engineering Experiment Station (TEES), Texas Engineering Extension Service (TEEX) and the College of Engineering. Texas A&M Engineering is a technical agent of the Department of Homeland Security’s System Assessment and Validation for Emergency Responders (SAVER) Program.

SAVER provides fire/rescue, law enforcement and other emergency responders with comparative information about equipment they use on the front lines of homeland security. This includes market surveys, technology guidebooks, and test and evaluation reports.

As part of Texas A&M Engineering, TTI supports TEEX and TEES by providing test instrumentation, analysis and documentation for SAVER.

The project capitalizes on Texas A&M Engineering’s unique qualifications, internal and external to the organization. “The partnership that TTI has with TEEX, TEES and the College of Engineering, enables each of us to leverage the others’ strengths. By doing so we’re able to conduct research and testing as a team much more effectively than any one agency could do alone,” explains David Bierling, TTI Assistant Research Scientist.

According to Bob McKee, Director of TEEX’s Urban Search and Rescue Division and Texas Task Force 1, the SAVER pro-

Working Together to Secure the Homeland

The events of September 11, 2001, brought us together as a nation unlike any event since the bombing of Pearl Harbor. Now more than ever, Americans are working together to meet the public safety challenges facing our country—from terrorist attacks, to natural disasters, to everyday emergency response needs.
gram recruits some of the best firefighters and police officers in the country to help Texas A&M with the testing and evaluation. “These people are leaders in their departments as well as on the national level,” explains McKee. “SAVER is all about testing by emergency responders, for emergency responders.”

The A&M Engineering team has tested various technologies— including hydraulic rescue tools (HRTs), portable tire deflation devices (PTDDs), and search cameras—vitaly important to homeland security and emergency responders. For example, fire and rescue teams use HRTs (cutters, spreaders and rams) to pry open crashed vehicles and free trapped victims. Working in close cooperation, the A&M engineering agencies conducted several tests at TTI’s Riverside Campus facilities, identifying performance differences for six different manufacturers of HRTs. The results will help public agencies make wise purchasing decisions for systems that can have a nationwide annual market value in the millions of dollars.

“Working across organizational boundaries in an efficient, cost-effective manner is a challenge for any project such as this,” explains Don Dickson, executive director of the Texas Center for Applied Technology for TEES. “Texas A&M Engineering’s ability to respond to SAVER project needs with input from our federal sponsor, and emergency responder community, depends on this cooperation.”

A&M’s teamwork also includes evaluation of video inspection cameras. These systems are used by search and rescue teams to inspect holes and crevices in rubble piles and find trapped victims, and are also used by law enforcement officers to inspect vehicles for hidden bombs and drugs.

Last summer, the team worked together to test “spike strips” that police officers use to disable vehicles in high-speed chases. The challenge is to deploy the spikes effectively so that they impact suspects vehicle’s tires, and then remove the spike system quickly to avoid damaging police or civilian vehicles.

Coordinated by TEEX’s Urban Search and Rescue Division and TTI’s Multimodal Freight Transportation Programs, the testing used a tire pressure monitoring device designed and built by Dick Zimmer, TTI’s Proving Ground Manager. Law-enforcement officers from local police departments and TEEX’s law-enforcement driving instructors helped evaluate system effectiveness. One of the systems proved ineffective on dirt roads, and another created safety concerns. Armed with these data, law enforcement agencies can more effectively protect and serve their citizens.

“Homeland Security’ is a monolithic term we hear a lot about these days. In reality, it’s the sum total of numerous efforts around the country. As one of those vitally important efforts, Texas A&M’s partnership in the SAVER program is helping secure our nation’s future.”

G. Kemble Bennett, vice chancellor and dean of Texas A&M Engineering
Didn’t see it coming.

New crash barrier standard in development to protect pedestrians from wayward vehicles, or something worse

Five people were uninjured after a 1998 Lexus plowed into a shop in Houston, Texas. Photo courtesy of the Houston Chronicle, 2002.
It’s sobering to think that stopping in at the neighborhood coffee shop could cost us our life. Yet dig into media coverage in communities everywhere, and you will discover that an alarming number of errant vehicles are crashing into sidewalk cafes, daycare centers and banks. Most of the crashes are unintentional, but what if they were not?

In a post-9/11 era it’s better to be safe than sorry and prepare for both. Thanks to a new standard under development by the Texas Transportation Institute (TTI) and ASTM International (formerly the American Society for Testing and Materials), pedestrians may be able to enjoy their mocha latte’ without fear of a close encounter with a few tons of glass, steel and wheels—regardless of the driver’s intent.

“The problem we’re addressing with this new standard isn’t getting a lot of media attention,” says Dean Alberson, assistant agency director and research engineer at TTI. “But a lot of people are getting hurt nonetheless, and we’re developing a standard to test safety and security devices—bollards, for example—for low-speed areas like parking lots.”

Alberson, who is spearheading TTI’s contribution toward the new standard, says that contemporary designs of sidewalk cafes, convenience stores, malls and bus stops often put pedestrians in close contact with vehicles.

“Pedestrian traffic is concentrated around store entrances, so that’s where we’re focusing this new standard,” says Alberson. “Ten years ago we would have just geared the standard toward protecting pedestrians against errant vehicles. But today our awareness has been raised because of terrorist attacks, and we have to account for that.”

Alberson says that while the new standard doesn’t cover the design of parking lots, designers can boost the safety of their parking lots by not allowing drivers a straight shot through the parking lot and into the front of a building.

Rob Reiter, national sales manager for Cal Pipe Security Bollards, helped spur development of the new standard with the ASTM International Committee F12 on Security Systems and Equipment.

“Separating pedestrians from traffic and protecting storefronts from the impacts of cars that jump curbs as a result of operator error are compelling issues of public safety and building design,” says Reiter. “Research from news sources and the insurance industry indicates that cars slam through doors, windows and walls of schools, public areas and commercial buildings at the rate of more than 100 per month around the country. Property damage, business interruption losses, personal injuries and fatalities are common.”

Reiter says the testing protocols being pioneered at TTI help create ways to evaluate products and materials that provide simple security, pedestrian protection or the ability to stop vehicles less than 5,500 pounds, traveling at normal speeds.

“We at Cal Pipe Security Bollards look forward to working with TTI in the formulation of ASTM testing standards and to conducting our impact testing program at the premier testing facility in the United States,” says Reiter.

Ed Conrath, a structural engineer with the Protective Design Center of the U.S. Army Corps of Engineers, is an ASTM committee member who recently echoed the importance of developing the new standard for protecting pedestrians.

“This is a necessary standard that, if implemented, will save lives and property,” says Conrath.

Once crafted by the ASTM committee, the standard will be binding when a governing agency adopts it. Meaning, if the U.S. Departments of State, Homeland Security, or any other agency require the standard, then builders will have to install proven, tested materials outside the building for maximum safety.

“The standard will give municipalities and others a means to evaluate competing safety and security products,” says Alberson. “Right now there is no testing standard, so if a vendor says, ‘I have a bollard to put in front of your café,’ there’s really no way to know its resistance to impact. This should be a boon to the public and private sector because they’ll have a means to compare the safety devices they’re buying for their facilities—and that’s a really valuable part of the standard.”

Alberson expects to conduct testing on protective bollards and other devices using a low-speed, wheeled bogie type test vehicle or pendulum bogie test apparatus.

For more information, please contact Dean Alberson at (979) 458-3874 or d-alberson@tamu.edu.

A wrecker loads a car that ran into a store in Houston, Texas, killing a woman that was inside. Photo courtesy of the Houston Chronicle, 2003.
Bridging Ivory Towers: 
U.S. Universities Join Forces for National Security

College rivalries do not just involve sports teams. Academic institutions also compete for federal research dollars. But the academic community also works together on many projects, including combining resources to most effectively protect our nation.

Two groups—the Southwest Border Security Consortium (SBSC) and the Texas Homeland Security Group (THSG)—are striving to improve security in their respective regions. A leading member of both teams is Texas A&M Engineering.

Some in the private sector might charge that anything academia can do, they could do as well or better. In terms of providing practical solutions to real-world problems, TTI Associate Director Bill Stockton disagrees.

“Sometimes academia gets a bad rap for being exclusionary, elitist and too research oriented,” explains Stockton, who is also Texas A&M’s representative to the SBSC. “The reality is that we offer world-class staff, faculty and research facilities aimed at applied problem-solving. 9/11 reminded us that, research efforts conducted to solve one problem can be readily adapted to homeland security challenges. Furthermore, the universities in the southwest have been conducting a wide variety of significant research at the border for many years—we know the region.”

The SBSC focuses on advancing the security of the U.S. southwestern border by sharing resources and maintaining open communication among constituent universities. The consortium seeks to apply its unique assortment of world-class research, development, testing and evaluation assets to solve national security problems. Though focused on homeland security, this partnership has already produced real-world applications through other joint ventures among the partners, leading to successful teaming on non-security research opportunities. Over the long term, the partnership will also help border states overcome localized security challenges, as well as broaden and expand the research portfolios of participating universities.

The THSG—composed of Texas A&M and University of Texas institutions—evolved from the cooperative model established by Don Phillips, Chevron Professor of Industrial and Systems Engineering at Texas A&M. As academic institutions, the schools offer objective academic research and practical application. In short, they’re not vendors selling something; they’re public institutions acting in the public good. And because each component offers unique capabilities, the whole is truly greater than the sum of the parts.

Some habits die hard, but the spirit of cooperation encouraged by these groups enables member colleges to overcome old rivalries and work together to improve the country’s capability to predict, prevent and respond to security threats, for example: adapting expertise applied to disaster response, truck inspections and illegal drug interdiction. Each institution has learned to shed its individual school colors to join a bigger team with a vital mission.

“Throughout our history, American ingenuity has proven essential to the success and welfare of this nation,” notes Phillips. “There is no greater source of that kind of innovative thinking than in our higher institutions of learning.”
University Center for Mobility Launches at TTI

Former United States Department of Transportation Secretary Norman Y. Mineta said it best, “Congestion kills time, wastes fuel, and costs money...We need a new approach and we need it now.” The Secretary notes that this country loses $200 billion per year just to freight bottlenecks and delayed deliveries. Secretary Mineta added further that Americans lose 3.7 billion hours and 2.3 billion gallons of fuel per year due to traffic jams.

A new center dedicated to addressing mobility issues was recently established at the Texas Transportation Institute (TTI). The University Transportation Center for Mobility (UTCM), paired with the broad capabilities of TTI, presents a unique opportunity to make a positive difference in mobility for Texas, the region and the country.

In combination with the long-standing Southwest University Transportation Center (SWUTC), which was recently renewed with additional funding following a national competition, the University Transportation Centers (UTC) Programs at TTI will strengthen interdisciplinary collaboration in transportation education and research across the A&M System. They will also provide opportunities to partner with other UTCs in this region of the nation. UTCM’s programs will strengthen TTI’s existing academic relationships, as the new center’s research and education programs will be conducted in partnership with such diverse colleges and programs as architecture, engineering, agriculture and the Bush School, among others.

The mission of the center focuses on the following four key research areas.

- Coast-to-coast, border-to-border mobility – This research focus area addresses all transport modes and the linkages between them from a regional and national viewpoint. “Because we are a center without regional boundaries, we have a chance to address the coast-to-coast, border-to-border mobility issue in a way that no other transportation center can,” says Melissa Tooley, UTCM director. “I believe that we have a tremendous opportunity to make a difference in national mobility in this research area.”

- Rural public transportation – Potential research topics address enhancing routing methods and advancing the use of technology by rural transit systems, and improving safety. The Colonias, a series of economically disadvantaged small communities along the Texas/Mexico Rio Grande border, have unique transit needs that will also be considered.

- Congestion management and mitigation – UTCM support will facilitate an expansion of TTI’s current efforts in congestion management and mitigation, provide support for expanding the estimates of benefits from mobility improvement programs and set the stage for a major, long-term research initiative in this area.

- Innovative financing – UTCM will coordinate with TTI’s Center for Tolling and other relevant groups to explore financing strategies for different transportation modes. UTCM will also work with industry partners, such as the American Road and Transportation Builders Association (ARTBA), which is already active in this area. Research conducted by TTI on managed lanes has helped advance this approach in Texas and throughout the country. This expertise will be invaluable in the public education efforts necessary for successful implementation of public-private partnerships in Texas and nationwide.

The center was established using designated funds from the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), enacted on August 10, 2005. SAFETEA-LU authorized the United States Department of Transportation to establish and operate up to 60 UTCs throughout the United States.

“The center has a great opportunity to make a lasting impact with research on some of the major challenges that currently exist in transportation,” says Herb Richardson, director emeritus of TTI.

One of the goals of the newly established University Center for Mobility is to reduce congestion.
The son of slaves, Morgan had only an elementary education. He left Kentucky in 1895 as a teenager searching for opportunity. He settled in Cincinnati, Ohio, and soon became well-known for his talent as a sewing machine repairman, eventually starting his own tailor shop. In fact, much of the sewing in his 32-employee operation was done on machines he built. Morgan is also recognized as the inventor of a version of the gas mask eventually modified and used by the U.S. Army in World War I. He established a successful newspaper, and over his lifetime held patents on a variety of personal grooming products.

It was his experiences driving on the streets of Cleveland, however, that prompted Morgan to enter the transportation arena. Early twentieth-century vehicle crashes were frequent, and after witnessing the death of a young girl in a collision between an automobile and a horse-drawn carriage, he crafted a T-shaped pole unit that featured three positions: Stop, Go and an all-directional stop position that halted traffic in all directions to allow pedestrians to cross streets more safely.

In his 1923 U.S. patent for the manual traffic signal, Garrett Morgan stated “This invention relates to traffic signals, and particularly to those which are adapted to be positioned adjacent the intersection of two or more streets and are manually operable for directing the flow of traffic.... In addition, my invention contemplates the provision of a signal which may be readily and cheaply manufactured.”

Morgan’s hand-cranked semaphore traffic management device was in use throughout North America until all manual traffic signals were replaced by early models of the automatic red-, yellow- and green-light traffic signals currently used around the world.

Shortly before his death in 1963, the United States Government awarded Morgan a commendation for his traffic signal.
Tolling is an important issue not only in Texas, but throughout America and abroad. For this reason, it is important to disseminate the most current research and information available to transportation professionals. The “Freeway and Tolling Operations in the Americas” conference seeks to accomplish this goal by bringing together professionals throughout the world during a two-day conference in Houston, Texas, on May 20-23.

“This conference will bring together professionals from across the Americas representing a number of transportation specialty areas including freeway operations, tollway operations, emergency management and highway finance to share experiences, identify research requirements and develop solutions where possible,” says Phil Masters, chair of the Transportation Research Board (TRB) Freeway Operations Committee. “The focus of the conference is on the impacts of pricing and public-private partnerships on the operations of freeways and tollways.”

The event is sponsored by the following TRB Committees: Freeway Operations, Congestion Pricing, High-Occupancy Vehicle Systems and Emergency Evacuation. Hosted by the Texas Transportation Institute (TTI), other supporting agencies include the United States Department of Transportation and the Texas Department of Transportation.

Conference planners hope to build upon the success of the 1st International Symposium on Freeway and Tollway Operations, which was held June 4-7, 2006, in Athens, Greece. The symposium was attended by 500 participants and included nearly 120 speakers over a 3-day period.

“That symposium, which was also spearheaded by the TRB Freeway Operations Committee, identified that the differences between freeway and tollway operations were rapidly disappearing, and these two groups had much they could share and learn from each other,” says Masters.

On Monday afternoon, conference attendees are invited to travel around Houston on a technical bus tour to view the IH-10 Katy Freeway & Tollway (Managed Lanes), Westpark Tollway and Houston TranStar Transportation Management Center.

“The Center on Tolling Research at TTI is pleased to have the opportunity to help host this event. The conference represents our goal of sharing research and best practices on toll road operation,” says Christopher Poe, center director and TTI assistant agency director.

For more information on the program, please contact Christopher Poe at (972) 994-0433.

For registration information, please contact TTI Event Management and Planning at (979) 862-1219, e-mail events@tamu.edu or visit the website at http://tti.tamu.edu/conferences/ftoa/.

“This conference will bring together professionals from across the Americas representing a number of transportation specialty areas including freeway operations, tollway operations, emergency management and highway finance to share experiences, identify research requirements and develop solutions where possible,” says Phil Masters, chair of the Transportation Research Board (TRB) Freeway Operations Committee.
TTI at TRB

The Texas Transportation Institute (TTI) was well represented at the Transportation Research Board (TRB) 86th Annual Meeting January 21-25 in Washington, D.C. TTI researchers presented papers on numerous topics, and chaired and participated in committee meetings and other activities.

Richardson receives CUTC award

Texas Transportation Institute (TTI) Director Emeritus Herb Richardson received the 2007 Council of University Transportation Centers (CUTC) Award for Distinguished Contribution to University Transportation Education and Research during a ceremony preceding the TRB annual meeting.

Awarded annually by CUTC, the honor recognizes individuals with a long history of outstanding contributions to university education and research, resulting in a lasting impact on the transportation field. Richardson was selected by the CUTC executive committee from a list of nominees submitted by council members.

“The CUTC Award for Distinguished Contribution to University Transportation Education and Research is a premier award, reserved for those whose service has been at the highest levels for an extended period, and whose accomplishments have made a significant difference,” says Dan Turner, University of Alabama, President, Council of UTC. “In simple terms, past winners are icons of our profession, and Herb Richardson certainly falls in that category.”

Herb Richardson Honored

Director Emeritus Herb Richardson received the Roy W. Crum Distinguished Service Award January 24 during the Chairman’s Luncheon. The prestigious Crum Award recognizes outstanding achievement in the field of transportation research.

Richardson retired from TTI last fall after 22 years of service to the Texas A&M University System, which included 13 years as TTI director.

Bligh Team Wins Award

Four TTI coauthors were recipients of the K.B. Woods Award for their paper entitled “Low-Deflection Portable Concrete Barrier.” The award was presented January 22.

Roger Bligh, Nauman Mansoor Sheikh, Dean Alberson and Akram Abu-Odeh were recognized for best paper in the area of design and construction of transportation facilities. The paper describes a new barrier system developed for use in a highway work zone.

Bligh was also the recipient of last year’s K.B. Woods Award.

Other Notable Events

- Ginger Goodin was named incoming chair of the High Occupancy Vehicle Systems Committee.
- Jerry Ullman was named incoming chair of the Work Zone Committee.
- Gene Hawkins was honored for his six years of service as chair of the Traffic Control Devices Committee.
- A paper by Dominique Lord and Ravi Agrawal, a former student, was selected as the best paper by young researchers by the Statistical Methodology and Statistical Computer Software in Transportation Research Committee.
Deer-Vehicle Research Set to Begin after Inaugural Meeting

Members of the eight-state Deer-Vehicle Crash Information and Research Center (DVCIR Center) Pooled Fund Project, operated through the Texas Transportation Institute (TTI), held their inaugural meeting January 30-31 at the Minnesota Department of Transportation training facility in Shoreview, Minnesota. The group discussed the project organization and status and recent and ongoing deer-vehicle crash projects. They identified and prioritized potential research ideas for project funding. The Pooled Fund Project members decided to pursue four research projects that focus on defining and reducing the number of deer-vehicle crashes.

The members of the Pooled Fund Project are department of transportation employees from Connecticut, Iowa, Maryland, Minnesota, New Hampshire, New York, Ohio and Wisconsin. Those states, along with the Federal Highway Administration, have pooled their funds and have assembled more than $300,000. The Southwestern Region University Transportation Center and Center for Transportation Safety at TTI are supporting sponsors of the project.

TTI Associate Research Scientist Keith Knapp, who is the director of the DVCIR Center, says the group started with more than 40 ideas and ultimately voted on nearly 20 potential projects. “This list of the top four projects will get us all moving in the right direction. Now, we have to develop the structure and focus for the projects and conduct the studies,” Knapp said.

The potential projects are:

- roadside management and policies including vegetation choices, mowing, and other factors,
- evaluation of crash data to pinpoint and prioritize trouble spots for countermeasures,
- assessment of public opinion and development of effective outreach methods and messages, and
- quantitative methodologies for the placement of existing or re-designed warning signs.

“The problem of deer-vehicle crashes is in almost each state and has been around a long time, so I’m happy that we will soon be moving forward with a plan of action,” Knapp said. Deer-vehicle crashes kill about 200 people a year and cost the traveling public more than $1 billion.

Second Annual Texas Transportation Forum

An efficient transportation network is the lifeblood of economies and communities across Texas and the nation. Join us at the second annual Texas Transportation Forum as local, regional and state leaders join national experts to discuss ways to “Keep Texas Moving.”

Proudly serving as your co-hosts are the Texas Department of Transportation, the Associated General Contractors of Texas, the Texas Good Roads Transportation Association and the Texas Transportation Institute.

For registration information, please contact:
Event Management & Planning
Texas Transportation Institute
979-862-1219
979-862-1225 (FAX)
888-550-5577 (toll-free)
E-mail: events@tamu.edu
http://tti.tamu.edu/conferences/ ttf07/

Chancellor McKinney Tours TTI

Newly appointed Texas A&M University System Chancellor Michael McKinney toured the Texas Transportation Institute (TTI) on March 6. TTI Director Dennis Christiansen kicked off the meeting with an overview presentation, which was followed by summaries of TTI’s work in areas including ground-penetrating radar, teen driving safety and congestion research.

“Through the Texas Transportation Institute (TTI), we are doing great work in developing materials and safety devices for the transportation industry. This work is more far-reaching than most of the general public knows,” said McKinney.

McKinney heard about the Institute’s reputation and working relationships during presentations from Civil Engineering Department Head David Rosowsky, Texas Department of Transportation Research Engineer Rick Collins and TTI Council Chair David Cain.

McKinney’s visit concluded with a full-scale crash test at TTI’s Riverside Campus facility, where researchers are developing a new guardrail system.

“TTI’s contribution to the state’s economy through improving the transport of goods and materials across our roads and through our pipelines is tremendous,” McKinney said.
Jim Carvell Retires

After 26 years with the Texas Transportation Institute (TTI), Senior Research Engineer Jim Carvell now has more time to fish, visit with grandchildren and play guitar with fellow engineers who make up a group of “musicians” known as Tonedef.

At his retirement reception on December 14 in Dallas, Carvell reflected on his many friends at the Institute. “I had friends and colleagues who came from Nevada, Oklahoma, Arkansas, Colorado, Houston and College Station to wish me well,” Carvell said. “This is absolutely the best place in the world to work. There is a certain camaraderie here that you can’t find anywhere else.”

Among the speakers for his reception were TTI Director Dennis Christiansen, TTI Director Emeritus Herbert Richardson, Carvell’s former boss and TTI Houston Office head Dick McCasland, TTI Associate Director Ed Seymour and Robert Wunderlich, international director of the Institute of Transportation Engineers (ITE), who presented Carvell with a citation from the International Board. Also on hand was TTI Associate Research Engineer Jason Crawford who presented Carville with a resolution from TexITE. Carvell’s family presented TexITE with an endowed fund which will generate funds for an ITE student member to attend the annual ITE meeting.

“I am most proud of the work that has been done on freeway management projects and the relationship with TxDOT,” Carvell said.

TTI Research Engineer Receives ASCE’s Kapp Award

TTI Research Engineer and Buchanan Chair Professor of Civil Engineering Jean-Louis Briaud received the prestigious Martin S. Kapp Foundation Engineering Award during ceremonies at the American Society of Civil Engineers (ASCE) Geo-Institute conference in Denver.

The Kapp Award is given on the basis of the best example of innovative or outstanding design or construction of foundations, earthworks, retaining structures, or underground construction. Emphasis is placed on constructed works where serious difficulties were overcome or where substantial economies were achieved.

Briaud’s plaque reads “for his many contributions to innovative foundation engineering through his work in academia and private consulting practice, and for his efforts leading to numerous practical innovations which have permitted difficult foundation problems to be overcome.”

TTI’s Robert Lytton Receives NOVA Award

Robert Lytton, TTI research engineer and Benson Chair Professor in the Zachry Department of Civil Engineering at Texas A&M University, received the 2006 NOVA Award from the Construction Innovation Forum for his Pavement Composition Analysis (PCA) research.

Lytton’s award-winning research uses an air-launched, ground-penetrating radar to aid highway construction quality control. The radar is swept over a completed section of pavement to analyze its properties, including its composition, number of layers and the thickness of each layer. Engineers can then plot lane-width maps with contours of each composition element, helping them pinpoint flaws in the construction process and ultimately resulting in safer, longer-lasting roadways. This method is equivalent to analyzing 18,000 core samples in a given lane-mile of a project, while only two cores every four lane-miles is required for calibration with Lytton’s PCA method, saving both time and money.
HEART Crash Cushion wins award

The HEART Crash Cushion is much easier to say than the Hybrid Energy Absorbing Reusable Terminal. But that’s what it is. The crash cushion, developed by Texas Transportation Institute researchers Dean Alberson and Lance Bullard, is designed to be reusable after most crashes and therefore, a money saving product for taxpayers.

Alberson and Bullard were honored February 23 by the Texas A&M University System Office of Technology Commercialization during its 2007 Patent and Innovation Awards Luncheon. In all, 21 Texas A&M researchers were recognized for their ideas.

“It was a five-year project to get the HEART Crash Cushion developed, tested and patented,” Alberson said. “We came up with the idea on a notion that we could improve what was on the road at the time.”

Alberson says the Federal Highway Administration has given its acceptance to the crash cushion.

Managed Lanes Open House

With several managed lanes proposed in the Austin region in coming years, the Texas Transportation Institute (TTI) helped the Austin District of the Texas Department of Transportation organize an open house February 20 at The University of Texas Thompson Conference Center to explain how this relatively new concept offers options for commuters.

“We answered a lot of questions,” says TTI Research Engineer Ginger Goodin. “The open house was well attended and it prompted plenty of media attention.”

Managed lanes are a cousin to the high-occupancy vehicle (HOV) lanes that have been in operation for decades around the county. The most common type is one where lower-occupant vehicles are allowed into HOV lanes by paying a toll, providing the driver with the option of a less-congested trip on a one-time or regular basis. These vehicles are charged a varying toll based on traffic conditions in the lanes in order to keep the lanes flowing.

Currently, managed lanes with this kind of variable pricing are in operation in Denver, Colorado; San Diego and Orange County, California; and Minneapolis, Minnesota, with a new facility under construction in Houston on the Katy Freeway.

During the open house, displays representing several projects were on hand for public viewing, experts were available for one-on-one Q&A, and a brief presentation was provided to the public every 30 minutes explaining how managed lanes operate.

Briaud Recognized for Engineering Innovations

Texas Transportation Institute (TTI) Research Engineer and Buchanan Chair Professor of Civil Engineering Jean-Louis Briaud has been awarded the 2007 Ralph B. Peck Award from the American Society of Civil Engineers (ASCE). The awards ceremony was February 19 at the National Congress of the Geo-Institute in Denver.

In a letter notifying Briaud of the award, the Executive Director of ASCE, Patrick Natale told him “the selection committee particularly noted your development of a new method for prediction of bridge scour depth which was applied to the design of the new Woodrow Wilson Bridge.”

In addition, Briaud received the Martin Knapp Lecture Award after his presentation to the ASCE in New York City on December 14. The lecture included details of three major research projects over the last 15 years that led to advances in foundation engineering.
“Moisture-Related Cracking Effects on Hydrating Concrete Pavement,” by Anil Mukhopadhyay, 0-1700-6, November 16, 2006.


“Content for the Forensic Flexible Pavement Knowledge Management System,” by Paul Krugler, 0-4505-P7, October 12, 2006. (set of CDs)


“List of Tier-One Pavement Sites and Summary of Data and Information,” by Paul Krugler, 0-5472-P3, November 17, 2006. (CD)


“Regional Mobility Authority: Creation to Implementation,” by Tina Collier, 5-4055-01-2, November 10, 2006.

ORDERING INFORMATION
To order published reports or project summary reports listed above, please contact:
Nancy Pippin at (979) 458-0481
Fax: (979) 845-7575
e-mail: n-pippin@ttimail.tamu.edu

Report prices vary depending on the length. The Texas Transportation Institute accepts checks, money orders and credit cards.
A full catalog of TTI publications and other products can also be found at http://tti.tamu.edu/publications.