

TTI's Center for Alcohol and Drug Education Studies Works to Eliminate Impaired Driving

Texas A&M's Center for Infrastructure Renewal Cuts the Ribbon on Infrastructure Innovations for State, Nation

TTI's Center for Ports and Waterways Helps Sponsors Navigate Economic Opportunity

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ON THE COVER: Researchers at The Texas A&M University System's Center for Infrastructure Renewal are developing advanced and sustainable materials and structural systems that will reduce costs associated with infrastructure while extending infrastructure life, safety, resiliency and durability.



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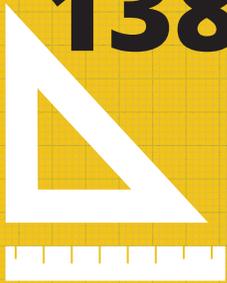
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By the Numbers: The Center for Infrastructure Renewal*

Located at The Texas A&M University System's RELLIS Campus

AT A GLANCE

See related story on page 10



138,000
square feet



10
LABORATORIES



4 participating
TEXAS A&M
COLLEGES



8 participating
TEXAS A&M
DEPARTMENTS



2 managing
state
AGENCIES



\$80 million
TO BUILD

**The Center for Infrastructure Renewal is a shared facility of the Texas A&M Engineering Experiment Station and the Texas A&M Transportation Institute.*

SAFETY RESEARCH ESSENTIAL IN LIGHT OF NATIONAL INCREASE IN TRAFFIC CRASHES

TTI's Center for Transportation Safety



With fatal and serious-injury crashes on the rise, the work of the Texas A&M Transportation Institute's (TTI's) Center for Transportation Safety (CTS) is more critical than ever.

"We've seen a steady increase in crashes over the last five years in Texas. A large part of this is due to the economy being better: we're driving more, and in particular, higher-risk drivers like young people between 18 and 24 are driving more," explains TTI Senior Research Engineer Robert Wunderlich, center director. "At CTS, we're researching and implementing strategic solutions to reduce risks for all users of the transportation system."

CTS was created in 2001 to focus on traffic safety research, policy analysis, education and outreach in Texas. The center has leveraged its annual appropriation of \$1 million in state funds to secure total annual funding in excess of \$6 million. Some of the center's most notable research contributions as a champion of traffic safety include the following.

Thought Leadership in Traffic Safety

Working with the University of Michigan Transportation Research Institute on a project funded by the National Cooperative Highway Research Program, CTS examined the primary factors related to the significant decrease in fatalities in the United States from 2005 to 2011 and why fatalities are rising again. Findings providing new insight into major factors impacting traffic safety risks have been well received. What began with Wunderlich serving as a panel speaker at the Governor's Highway Safety Association Annual Meeting has developed into an oft-requested keynote presentation at six state traffic safety conferences around the country.

Vehicle-Human Interaction

Leading the TTI team recently selected by the National Highway Traffic Safety Administration for an indefinite delivery indefinite quantity contract, CTS will evaluate how vehicle-based systems affect driver behavior and performance by examining deployment of new in-vehicle technology, evaluating options, and identifying potential safety issues. Researchers will look at crash-avoidance systems, how crash risk is affected, what system performance requirements should be implemented, and how to predict system effectiveness.

Cutting-Edge Techniques

CTS is developing new research techniques by exploring data mining of written narratives, using systems modeling to determine countermeasure potential, understanding the role traffic crashes play in occupational safety, developing apps and positive reinforcement to discourage distracted driving, and exploring how demographic characteristics relate to traffic crashes.

Outreach Efforts Targeting Specific At-Risk Populations

Center researchers lead outreach efforts like the Texas Motorcycle Safety Coalition, the Texas Impaired Driving Task Force, and the Pedestrian Safety Task Force. CTS's Youth Transportation Safety Program targets some of the most vulnerable road user populations — pre-teens, teens and young adults — and includes the award-winning Teens in the Driver Seat® program implemented in 38 states.

Behavioral Trends Research

Each year researchers conduct statewide surveys examining traffic safety culture and Texans' use of occupant protection, cell phones, attitudes and awareness, and provide the data to other professionals and the public. Results help track behavioral trends of Texans related to safety.



Implementation of Texas' Strategic Highway Safety Plan

Partnering with the Texas Department of Transportation, CTS is engaging Texans to develop and implement the new Texas Strategic Highway Safety Plan. Branded Texas Together on the Road to Zero, this effort aims to reduce traffic-crash risks in the state involving impairment, distraction, speeding, pedestrians, intersections, road and lane departures, and older road users.

"Each day in Texas, 12 people are killed in traffic crashes, and that number is absolutely unacceptable. Safety research is an essential piece of the equation in bringing that number down. The work we do here at the center is focused on bringing Texas together on the road to zero traffic deaths," says Wunderlich. ■



"At CTS, we're researching and implementing strategic solutions to reduce risks for all users of the transportation system."

*Robert Wunderlich, Director
Center for Transportation Safety*



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CENTER SUPERSTAR



Jena Prescott

In 2013, TTI Associate Transportation Researcher Jena Prescott graduated from The Bush School of Government and Public Service, where she developed a passion for research related to traffic safety and policy. Now a program coordinator for CTS's Center for Alcohol and Drug Education Studies, her research focuses on marijuana-impaired driving and ignition interlock devices. She also develops curricula and trainings for law enforcement, judges, probation officers and prosecutors.

"There are so many policy implications in impaired driving, especially with regard to marijuana impairment," Prescott explains. "We're at a crossroads where laws are changing more quickly than we can estimate what the traffic safety implications of marijuana use might be. It's fascinating to watch it all unfold and to be a part of it."

Prescott's current projects include ignition interlock training for the legal community and law enforcement, blood alcohol concentration (BAC) education and outreach to medical examiners and judges, and hosting two summits — one on improving BAC reporting in Texas and another on impaired driving and ignition interlock laws. Next year, she'll develop a policy tool kit and resource guides for use by the Texas Legislature and the Texas Department of Transportation.

"Many people in this arena agree that marijuana legalization is coming. We want to be as prepared as possible if and when that happens in Texas," Prescott says.



REACHING THE WORLDWIDE MARKETPLACE

TTI's Center for International Intelligent Transportation Research Solves Cross-Border Transportation Problems

For the international economy to thrive, economic development can't stop at national borders. Facilitating growth requires moving goods efficiently from one country to another, which in turn requires a vital, robust transportation system.

In 2006, the Texas Legislature established the Texas A&M Transportation Institute's (TTI's) Center for International Intelligent Transportation Research (CIITR). Through applied research, the center encourages cross-border economic competitiveness while improving the quality of life in border communities.

Over the past 12 years, CIITR researchers have conducted groundbreaking research to address problems unique to the El Paso-Juárez region but that often have global significance. For example, El Paso's projected growth from its 2010 Census population of 800,000 to 1.5 million by 2070 demands proactive approaches to mitigating problems that naturally arise, like traffic congestion.

"We apply technological innovations to troubleshoot congestion, improve mobility of people and goods, and mitigate air quality issues associated with growth

on both sides of the border," CIITR Director Rafael Aldrete explains. "Our overarching mission is to ensure security while facilitating mobility through innovative research solutions."

The three research projects profiled here demonstrate why the center's work is vital to the economic health of Texas and the nation as international trade continues to grow into the future. "But it's more than intellectual curiosity that drives us to find those solutions," Aldrete says. "El Paso is our home, too."

REDUCING CONGESTION: Making Connections Across Travel Modes

In El Paso, commuting at peak hours, like 8 a.m. or 5 p.m., can mean an hour sitting in traffic to travel 20 miles. The local metropolitan planning organization (MPO) is developing a multimodal plan promoting alternative travel modes (e.g., biking, walking or taking the bus) to help reduce congestion. CIITR researchers created a first-of-its-kind methodology to rate the relative benefits of each mode. The methodology provides for complete, multimodal trip-based evaluation, enabling the MPO to determine where gaps exist between modes and how to fill them. Beyond El Paso,



“CIITR personnel find solutions to problems through technological innovation, create new methodologies and processes to address challenges unique to the El Paso Region, and provide expert advice to decision makers who shape public policy.”

*Rafael Aldrete, Director
Center for International Intelligent Transportation Research*

any community wanting to find a multimodal solution to its mobility problems can adapt this methodology to meet local needs.



**TIME IS MONEY:
Better Estimating Wait
Times at the Border**

Knowing how long its trucks will take to pass through commercial ports of entry (POEs) is vital to any shipper’s business model. Until now, predicting freight crossing times simply hasn’t been practical due to disparate data sources and proprietary technology. Researchers created a website that supplies information from radio-frequency identification technology — currently

present in most trucks — to measure border wait times. Deployed at seven Texas commercial POEs, this system provides agencies like U.S. Customs and Border Protection (CBP) with reliable wait-time estimates, enhancing security. Moreover, shippers can use these estimates to more reliably schedule freight, and that can mean a better bottom line for U.S. manufacturers.

“Our core mission at CBP is to secure the nation’s borders while facilitating lawful travel and trade,” explains Jim Pattan, program manager for Innovative Programs Acquisitions, part of CBP’s Office of Field Operations. “TTI’s multiple research efforts over the years to better estimate border wait times and improve the accuracy of monitoring lane status at land ports of entry provide us with tools to accomplish that mission faster, smarter and more cost-effectively.”



**ENCOURAGING HEALTHY
U.S.-MEXICO TRADE:
Tracking Freight Traffic
Trends**

Since the mid-1990s, total yearly surface trade between the United States and Mexico has quadrupled from \$100 billion to \$400 billion. To help stakeholders better understand how freight moves between both countries via 25 land POEs, CIITR researchers identified freight traffic trends. One notable trend is the rate of increase of trade with interior states, especially Michigan and Illinois. Using these findings, manufacturers, shippers and policy makers can work together to move goods more efficiently, which can ultimately result in lower prices on store shelves for consumers. ■



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**CENTER
SUPERSTAR**



David Galicia

When TTI Assistant Research Scientist David Galicia moved to the United States from Mexico City in 2006, he noticed one big difference right away: public transportation played a larger role in facilitating mobility in Mexico City. So when he began his doctoral work at The University of Texas—El Paso, better transit planning in the United States became a passion. Galicia joined TTI as a graduate student researcher in 2008, inspired by a class taught by TTI Research Engineer Rajat Rajbhandari.

One of Galicia’s early innovations was a new methodology for estimating ridership demand. A 2009 study produced estimates that proved very accurate in 2015, when El Paso’s Sun Metro Mass Transit Department implemented route changes. This is one example of how Galicia’s work is already saving taxpayer dollars and improving transportation networks around the nation.

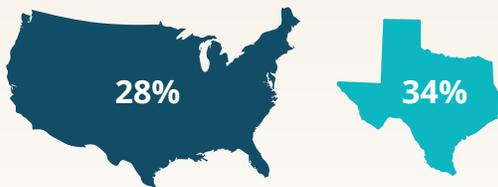
“GIS, wireless communication technology and other kinds of data are already out there,” Galicia says. “All we have to do is figure out how best to leverage them to help create a more cost-effective, useful transportation system for everyone.”



TTI's Center for Alcohol and Drug Education Studies Works to Eliminate Impaired Driving



Texas always ranks in the top 10 states for the highest rate of impaired-driving deaths per population.



Across the country, impaired driving accounts for 28 percent of all traffic deaths. In Texas, it's 34 percent.



TTI conducted a recent survey of 438 people in 25 Texas counties with the most alcohol-impaired fatal crashes and found:

40% favor marijuana legalization for recreational use

60% favor marijuana legalization for medicinal use

When traffic safety experts think about the problem of impaired driving in Texas, words like *troublesome* and *frustrating* come to mind.

Despite dedicated efforts to make Texas roadways safer, the Lone Star State typically leads the country in the number of alcohol-related deaths, and always ranks in the top 10 states for the highest rate of impaired-driving deaths per population.

Of the 10,497 U.S. impaired-driving fatalities that occurred in 2016, Texas experienced 1,438 of them. Across the country, impaired driving accounts for 28 percent of all traffic deaths. In Texas, it's 34 percent.

“Impaired driving is a huge problem in Texas, and there are numerous reasons for that,” says Research Scientist Troy Walden, director of the Center for Alcohol and Drug Education Studies (CADES) at the Texas A&M Transportation Institute (TTI). “One of the biggest hurdles we face is the cultural acceptance of drinking and driving.” Walden and his team of CADES researchers are dedicated to solving problems — through various education, outreach and research projects — caused by the irresponsible use of alcohol and other drugs.

Notable among these efforts is the Texas Impaired Driving Task Force that CADES organizes and manages each year through a Texas Department of Transportation (TxDOT) Traffic Safety Program grant. Approximately 60 members — professional safety advocates, transportation researchers, law enforcement, educators and members of the judiciary — serve on the task force.

The group targets specific problems with possible solutions to impaired driving at the state and local levels. As part of the TxDOT grant, CADES holds the Texas Statewide Impaired Driving Forum each year, which is open to professionals and the public concerned with impaired driving. (See <https://www.dyingtodrink.org/>.)

“TTI has played a big role in the partnership with TxDOT to address the most important driving safety issue in Texas,” says TxDOT Project Manager Frank Saenz. “The Impaired Driving Task Force and the annual Impaired Driving Forum are essential for Texans in bringing advocates to the table that have differing perspectives on what can be done to make our roadways safer.”

“Impaired driving is a huge problem in Texas, and there are numerous reasons for that. One of the biggest hurdles we face is the cultural acceptance of drinking and driving.”

*Troy Walden, Director
Center for Alcohol and Drug Education Studies*

For example, Saenz and other experts know that ignition interlocks help save lives. In Texas, judges are required to ensure all drivers convicted of a second DWI have an ignition interlock installed on their vehicles. When the device detects alcohol on a driver’s breath, his or her vehicle won’t start.

“Despite the law, we’ve found that many of the judges — especially in small rural counties — aren’t requiring ignition interlocks,” says TTI Research Scientist David Hodges, who joined CADES two years ago to help inform judges, prosecutors, probation officers and law enforcement. Hodges is a retired county court at law judge. “We need to get more buy-in about the benefits of ignition interlocks. There’s plenty of research that shows they work. But they can’t work if they aren’t installed.” This summer alone, Hodges will help conduct seven training sessions about the benefits of ignition interlocks.

Researchers are also focusing on the problems associated with drug-impaired driving. CADES is currently developing a broad-ranging marijuana policy toolkit for Texas



This driver is providing a breath sample via an ignition interlock device, an effective, proven countermeasure to driving under the influence.

that deals with all aspects surrounding legalization or decriminalization.

“With numerous states relaxing their marijuana laws, Texas needs to be prepared,” says TTI Associate Transportation Researcher Jena Prescott. The Institute conducted a recent survey of 438 people in 25 Texas counties with the most alcohol-impaired fatal crashes and found that 40 percent of respondents favor marijuana legalization for recreational use, and 60 percent favor legalization for medicinal use.

“The toolkit will include a resource guide and fact sheets that address things like taxation and impairment detection,” Prescott says. “We want to create a blueprint that sets the stage so legislators and other stakeholders can determine the best course of action before changing our laws.” ■



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**CENTER
SUPERSTAR**



Paige Ericson-Graber

After graduating six years ago from The Bush School of Government and Public Service at Texas A&M University with a master’s degree, Paige Ericson-Graber found herself working on domestic transportation issues at CADES.

Ericson-Graber works on various projects for CADES, but her biggest role is organizing the Texas Impaired Driving Task Force. It’s the center’s premier project and includes organizing the annual Texas Statewide Impaired Driving Forum.

“I found out pretty quickly that what we do is very important,” Ericson-Graber says. “The work sometimes takes extra hours, but the motivation is easy, especially when you consider that lives are at stake. It’s a noble cause, and I want to continue to be a part of that effort.”



TEXAS A&M'S CENTER FOR INFRASTRUCTURE RENEWAL Cuts the Ribbon on Infrastructure Innovations for State, Nation



“Imagine roads being paved with new materials that instantly harden so they reopen immediately afterward.”

*John Sharp, Chancellor
The Texas A&M University System*

Credited with acquiring the legislative funding needed for The Texas A&M University System’s Center for Infrastructure Renewal (CIR), Texas Lt. Gov. Dan Patrick was the special guest for the center’s ribbon-cutting ceremony held on Texas A&M’s RELIS Campus April 11. The 138,000-square-foot, multidisciplinary research center boasts state-of-the-art research facilities and laboratories aimed at making infrastructure smarter, more resilient and longer lasting. Ground was broken for the \$80 million project 17 months ago.

“At this particular time in history, infrastructure is a part of the national conversation,” Greg Winfree, agency director of the Texas A&M Transportation Institute (TTI), told the crowd gathered for the ceremony. “It’s never been more important to our state and to our country.”

The center is a joint facility operated by TTI and the Texas A&M Engineering Experiment Station (TEES) that will leverage the strengths of numerous engineering

professionals to develop research-based solutions to engineering and transportation challenges.

“Imagine roads being paved with new materials that instantly harden so they reopen immediately afterward,” A&M System Chancellor John Sharp said, highlighting some of the expected products of the center. “New ways to use asphalt that will pay for this place 50 times over, bridges that have sensors that self-report when they weaken and need replacing, and

homes and businesses that are flood- and wind-proof. Just imagine what this facility is going to be.”

Prior to the ceremony, Sharp, Patrick, Vice Chancellor and Dean of Engineering and TEES Director M. Katherine Banks, and several other elected officials who had critical roles in establishing the center toured its newly opened laboratories. CIR is designed to renew every public-critical infrastructure system — from transportation to nuclear reactors to water systems. This is a one-of-a-kind, coordinated, cross-disciplinary effort to focus on improving the nation’s infrastructure for the long term.

Sharp introduced Patrick, telling the crowd that CIR “absolutely would not have happened without him.”

“After walking through here, I know this is an investment that’s going to pay great dividends to the university, other universities, to the country, to the state of Texas,” Patrick said from the podium. “It’s going to make infrastructure more efficient, more affordable and safer for us.”

Texas Gov. Greg Abbott signed a proclamation presented to Sharp by Tommy Williams, senior advisor for fiscal affairs for the governor, recognizing the CIR ribbon-cutting ceremony. Charles Schwartz, chairman of the A&M System Board of Regents, gave attendees an overview of the new campus.

“I know this is an investment that’s going to pay great dividends to the university, other universities, to the country, to the state of Texas. It’s going to make infrastructure more efficient, more affordable and safer for us.”

*Dan Patrick,
Texas Lieutenant Governor*

“A few years ago, RELLIS existed only as an idea in the mind of John Sharp,” Schwartz stated. “In a few short years, we’ve seen an amazing development on these 2,000 acres. CIR will be a place where we’ll deliver the kind of professional workforce development training that we need in this state. We’ll see big things from these laboratories, and the people of the state of Texas will benefit from them.” ■



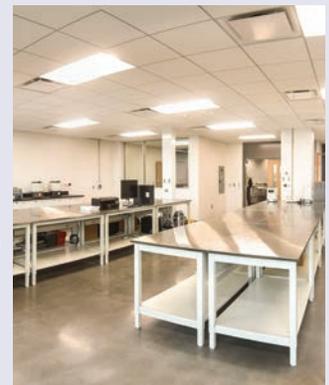
For more information, contact **Zach Grasley** at (979) 317-1201 or zgrasley@tamu.edu.

CIR Laboratories: Focused on Innovation

CIR’s 12 laboratories focus on the development of transformative infrastructure solutions — innovating new materials, technologies and processes to create solutions that last longer, have lower costs, and can be built in less time. CIR research is focused on nine critical infrastructure sectors: transportation systems; chemicals; communications; critical manufacturing; smart energy; information technology; nuclear reactors, materials and waste; and water and wastewater systems.

TTI maintains seven of the laboratories:

- ✓ Connected Infrastructure Laboratory
- ✓ Advanced Characterization of Infrastructure Materials Laboratory
- ✓ Asphalt Innovation Laboratory
- ✓ Asphalt Mixture Testing Laboratory
- ✓ Concrete Innovation Laboratory
- ✓ Soil/Unbound Materials Innovation Laboratory
- ✓ Structural and Materials Testing Laboratory



“CIR is the best civil infrastructure research and training facility in the United States. We’ve got the right people here to make a difference.”

*Zach Grasley, Director
Center for Infrastructure Renewal
Professor of Civil Engineering at Texas A&M University*





TTI's Center for Ports and Waterways Helps Sponsors Navigate Economic Opportunity

The Texas Marine Transportation System includes 1,000 harbor channels; 25,000 miles of inland, intracoastal and coastal waterways; and 3,700 terminals handling passenger and cargo movements. And it connects with 152,000 miles of rail, 460,000 miles of pipelines, and 45,000 miles of interstate highways.

With 11 deepwater seaports as international gateways and more than 1,000 miles of inland waterways along the Gulf Coast, waterborne freight transportation plays a vital role in the Texas economy, accounting for more than 17 percent of the Lone Star State's gross state product. That makes Texas one of the country's largest maritime states.

"Our wide-ranging expertise enables us to help TxDOT and other sponsors assess the broader impact waterways have and how properly maintaining them can positively impact local economies."

*Jim Kruse, Director
Center for Ports and Waterways*

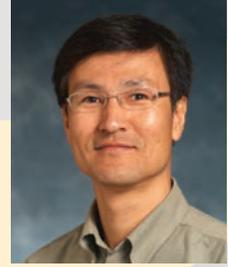
Since 1995, the Texas A&M Transportation Institute's (TTI's) Center for Ports and Waterways (CPW) has benefited Texas and the nation by conducting applied research at the local, regional and national levels. Its proven track record of innovative research, technology transfer and implementation makes CPW a valuable resource for the maritime industry. From local issues in water transportation to infrastructure funding and the proper evaluation of project cost/benefit, CPW researchers have helped ensure the safety, efficiency and productivity of our nation's maritime interests. Center professionals are thought leaders across multiple disciplines, including engineering and technology, environmental concerns, operations and logistics, planning and development, and trade and economics.

Maintaining a strong commitment to higher education and professional training, several CPW researchers hold joint teaching appointments and conduct specialized training programs. Additionally, graduate and undergraduate students actively participate in and make significant contributions to the center's successful research program.

"Our wide-ranging expertise enables us to help [the Texas Department of Transportation (TxDOT)] and other sponsors assess the broader impact waterways have and how properly maintaining them can positively impact local economies," explains TTI Research Scientist and CPW Director Jim Kruse. "From the cost of produce at the grocery store to the supply of refined products to encouraging a cleaner environment, Texas waterways are a vital factor in the economic equation."



**CENTER
SUPERSTAR**



Dong Hun (Don) Kang

Selected CPW Projects

Analysis of the Effects of Lack of Channel Maintenance Dredging

This study analyzed the effects of losing 1 foot of draft from actual maintained channel depths, resulting in increased economic impacts. Researchers identified five categories of effects: light loading non-container vessels, partial discharge at Woodhouse Terminal, maneuvering stern first, daylight restrictions, and light loading container shipments.

Gulf Intracoastal Waterway Master Plan

This research established a baseline for the condition and use of the Gulf Intracoastal Waterway in Texas (GIWW-T). The study looked at what's needed to restore and sustain the GIWW-T to its optimum level, major operational concerns, the impacts of operational obstacles (including a lack of dredging), and how TxDOT might be able to play a more active role in achieving a highly efficient and safe GIWW-T. This plan resulted in TxDOT partnering with the U.S. Army Corps of Engineers to identify solutions to problems posed by the current structures at the Brazos River Floodgates and the Colorado River Locks.

Preparation of Texas Strategic Maritime Plan

CPW experts identified knowledge gaps and potential research and development opportunities for TxDOT's Maritime Division to consider in its planning activities. The prepared document served as a springboard for the development of a formal five-year research and development plan.

Analysis of Effects on Port Operations from the March 22, 2014, Incident in the Houston Ship Channel

At 12:35 p.m. on March 22, 2014, a collision occurred in the Houston Ship Channel, spilling approximately 4,000 barrels of bunker fuel into the bay. This incident could have shut down the Houston-Galveston port area for a lengthy period and caused serious local and national economic harm. Instead, the channel was closed for five days. CPW researchers identified the effects the closure had on oceangoing and barge traffic, assessed non-traffic effects on refineries and petrochemical plants, and investigated how local industry and regulators managed the event, as well as how Houston Ship Channel users perceived their handling. ■

TTI Assistant Research Scientist Don Kang is housed in the Mobility Analysis Program. He's the Institute's lead data analyst on port mobility efforts and a recognized expert on automated identification service (AIS) data on vessel movements in and around marine ports. His background in industrial and systems engineering provides unique and extensive experience in a diverse set of mobility analysis and freight mobility projects.

Recently, Kang has contributed to groundbreaking work in the area of port operations and freight fluidity, and he continues development and implementation of a port performance management framework for the U.S. Army Corps of Engineers using AIS data transmitted by vessels. His thorough analytical skills have proven invaluable in dissecting and understanding complex port operations at the Port of Mobile, Alabama, and Port of Baltimore, Maryland, where he's tested the framework.



For more information, contact Jim Kruse at (713) 613-9210 or j-kruse@tti.tamu.edu.

Sharp Announces RELLIS, 3M Partnership

DURING THIRD ANNUAL
TEXAS A&M TRANSPORTATION
TECHNOLOGY CONFERENCE



“No testing facility anywhere can match the potential of the RELIS Campus as we work to build systems that enable safe and reliable communication between cars and our roadways. And TTI is both proud and grateful to have 3M as a valued partner in that mission.”

*Greg Winfree,
TTI Agency Director*

With the ability to make it rain at will, The Texas A&M University System’s RELIS Campus will soon boast a 1,000-foot-long, 50-foot-wide rain range thanks to a \$1.6 million investment by the 3M Company. The range will be used to test interactions between vehicle sensors and highway infrastructure under wet conditions at speeds of up to 60 mph. The sensors are essential to emerging technologies that support self-driving cars, as well as to systems enabling them to connect and communicate with roadway signs, signals and lane markings.

A&M System Chancellor John Sharp announced the partnership at the Third Annual Texas A&M Transportation Technology Conference May 7–9, hosted by the Texas A&M Transportation Institute (TTI). Attendees included officials from city, state and federal transportation agencies; automakers; consultants; educators; and researchers.

“No testing facility anywhere can match the potential of the RELIS Campus as we work to build systems that enable safe and reliable communication between cars and our roadways,” TTI Agency Director Greg Winfree told attendees. “And TTI is both proud and grateful to have 3M as a valued partner in that mission.”



The theme of this year’s conference was preparing for connected automation. Some 250 transportation professionals traveled to College Station, Texas, to discuss the various issues facing the private and public sectors as connected and automated vehicles (CAVs) grow closer to becoming a reality. From issues of security to the need for seamless communication among vehicles and between vehicles and infrastructure, this year’s conference asked the hard questions necessary to ensure a seamless transition to a connected transportation system.

“[3M] will substantially enhance and expand our research capabilities at RELIS,” Sharp told conference goers. “It will provide more opportunities for education and training for the next generation of the transportation workforce. This is also an exciting example of how the A&M System can work with private industry in all fields to address the challenging issues of today and tomorrow.”

The 3M collaboration with Texas A&M and TTI represents the first major industry partnership at the new RELIS Campus. In addition to funds for the rain range, the 3M investment will help purchase research equipment and support graduate students participating in CAV research.

“What talent will we need to help us realize the future of connected and automated vehicles?” asked Bob Anderson, 3M vice president of research and development. “We believe that sponsoring graduate



“We believe we will discover things by working together. All roads lead to College Station, Texas, with our extended collaboration.”

*Bob Anderson
3M Vice President of Research and Development*

students at the Ph.D. level is an important part of acting like a leader in this space.” Anderson urged others at the conference, especially private-sector representatives, to step up and do the same.

The TTI-hosted conference examined some of the numerous broad and complex questions surrounding CAV implementation, including the following:

- How quickly will the public embrace these new disruptive transportation technologies?
- What impact will CAVs have on employment and the economy?
- Will CAVs initially create more congestion?
- What will the impact be on insurance carriers and policyholders?
- Will there be enough trained engineers available for the future?

Recognizing that CAVs still hold many unknowns as the area develops, presenters at the conference

spoke with one voice: planning, collaboration, research and education are all vital in successfully navigating the uncertainties ahead.

“Right now our efforts are in proving these new technologies and demonstrating how these things are going to work,” Anderson said during the closing panel, titled Collaboration to Accelerate Deployment. “We believe we will discover things by working together. All roads lead to College Station, Texas, with our extended collaboration.”

Anderson predicted new educational disciplines will emerge as a result of the focus on transportation technologies. “The future has to start today. In the 1950s, it was rocket science. Autonomous vehicles today — that is the new rocket science.” ■



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Brydia Receives Partner of Excellence Award from Texas A&M



Brydia

Texas A&M University's Department of Industrial and Systems Engineering (ISEN) has recognized TTI Senior Research Scientist Bob Brydia for his ongoing collaboration with the department. Brydia was presented the Partner of Excellence Award April 13 and appointed an ISEN adjunct professor of practice.

"Over the last 18 months, Bob has worked closely with our students on 30 different projects he brought us as part of his leadership role with the Campus Transportation Technology Initiative," said Jose Vazquez, director of the ISEN Student Resource Center. "His one-on-one interactions with the students and his interest in furthering their education with hands-on research has truly been appreciated."

The team projects become part of the students' capstone design course, a two-semester-long course designed to "equip future engineers with important design, communication and presentation experience."

"Seeing the ingenuity and enthusiasm the students bring to the projects has been invigorating and rewarding," Brydia says. ■

TTI's Metsker-Galarza Receives Student of the Year Award



Metsker-Galarza

TTI Assistant Transportation Researcher Madison Metsker-Galarza of the Mobility Analysis Program received the David L. Pugh Outstanding Master of Urban Planning Student Award at the annual Texas A&M University College of Architecture's Landscape and Urban Planning Awards Banquet April 6.

She received her degree in environmental geoscience from Texas A&M and will graduate in December with a master's degree in urban planning.

Named for David Pugh, former head of Texas A&M's Department of Urban Planning and coordinator of the University's Master of Urban Planning (MUP) Program, the award is given to "a graduating MUP student who exemplifies exceptional service and academic excellence."

"Any recognition I receive is due to the mentors and the opportunities I've had during my time at TTI and Texas A&M," Metsker-Galarza said. ■



On March 9, Greg Winfree, TTI agency director, and Nathalie Crutzen, Smart City Institute director, participated in a memorandum of understanding signing ceremony.

TTI Signs Agreement with Smart City Institute in Belgium

On March 9, TTI signed a memorandum of understanding (MOU) with the Smart City Institute (SCI) of the University of Liège in Liège, Wallonia, Belgium. The MOU promotes collaboration on smart city issues among researchers at both institutes.

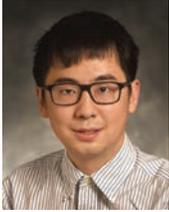
"We are pleased to be working with our partners at the Smart City Institute," notes TTI Executive Associate Director Katie Turnbull. "There are numerous opportunities to collaborate on research projects and conference presentations, as well as through exchanges involving students, researchers, faculty and community members."

The MOU signing ceremony took place at South by Southwest in Austin, Texas, on March 11, with TTI Senior Research Engineer Beverly Kuhn participating in a panel discussion organized and moderated by SCI Director Nathalie Crutzen. A second collaboration occurred May 18 when Executive Associate Director Katie Turnbull was featured as one of the keynote speakers for SCI's Smart Inspiration Day. ■



For more information about TTI News, contact **Rick Davenport** at (979) 862-3763 or r-davenport@tti.tamu.edu.

TTI's Ling and Lytton Awarded Best Paper by International Association



Ling

A National Cooperative Highway Research Program project describing a new mechanical-based method for testing aged asphalt led to international recognition for two TTI employees: Postdoctoral Researcher Meng Ling and TTI Research Engineer Robert Lytton.

"An Inverse Approach to Determine Complex Modulus Gradient of Field-Aged Asphalt Mixtures" was named a 2017 Best Paper by the peer-reviewed journal *Materials and Structures*, a publication of The International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM). The journal's board of editors chose the paper as one of 10 selected for recognition.

"Because of this work, for the first time, it is now possible to predict how solar radiation bakes an asphalt mixture in the field, making it more brittle and causing it to crack more readily," Ling notes.

"That kind of cracking is the major cause of the high deterioration rates of transportation infrastructure," Lytton adds. "It's a rare honor to be selected by RILEM as one of the best papers that it published in 2017."



Lytton

RILEM was founded in 1947 in Paris, France, and is made up of about 1,400 member institutions from 67 countries. The association was formed "to promote scientific cooperation and to stimulate new directions for research and applications, thus promoting excellence in construction worldwide." ■

TTI Partners with Mays Business School for Transportation Entrepreneurial Venture

TTI and the McFerrin Center for Entrepreneurship at the Mays Business School at Texas A&M University are combining forces in a new partnership announced May 9. The joint venture, called the Innovation Hub @ TTI, is the first of its kind for both TTI and Mays, since it marries the McFerrin Center's entrepreneurial-focused educational and experiential opportunities with TTI's deep transportation research expertise.

"We have the unique opportunity to help advance the discussion, create new knowledge, and bridge some of the gaps between the public and private sectors," TTI Agency Director Greg Winfree noted in announcing the partnership. The Innovation Hub @ TTI will function as a catalyst for interdisciplinary research and innovation in emerging transportation solutions and will involve TTI researchers, Texas A&M students, private-sector partners and the broader transportation community.

"TTI's researchers are a shining example of transportation thought leaders," said Blake Petty, McFerrin Center director. "We see the partnership as a prototype for problem-solving innovation and entrepreneurship training across the A&M System."



Left to right: TTI Senior Research Fellow Bill Stockton, TTI Senior Research Fellow Ginger Goodin, McFerrin Center for Entrepreneurship Director Blake Petty, Mays Business School Dean Eli Jones, TTI Agency Director Greg Winfree and McFerrin Center for Entrepreneurship Executive Director Richard Lester.

Leading the initiative for TTI, Senior Research Fellow Ginger Goodin says the partnership represents a paradigm shift in how the Institute formulates solutions to transportation problems. "The McFerrin Center offers TTI expertise in facilitating industrial partnerships and identifying marketplace needs to help us grow our private-sector relationships," she notes. ■

WTS Scholarship Awarded to TTI's Munira



Munira

This spring, TTI Graduate Research Assistant Silvy Munira received a \$7,000 scholarship from the Houston Chapter of the Women's Transportation Seminar (WTS).

The Helene M. Overly scholarship, a competitive award for women pursuing graduate studies in transportation, was awarded at the WTS Gala in Houston.

WTS is an international organization dedicated to the professional advancement of women in transportation. Munira is a Ph.D. student and has worked on multiple TTI research projects, including studies funded by the Institute's Safety through Disruption University Transportation Center. ■

Winfree Urges Advances in Connected Vehicles at Bloomberg Symposium

Predicting "a bit of the Wild West out there" as automated vehicles begin to share the road with human-driven vehicles, TTI Agency Director Greg Winfree



Bloomberg
Government

Next.

was the opening speaker of a Bloomberg Government symposium on transportation technologies held in Washington, D.C., May 16. Part of Bloomberg Government's Next. series, the gathering examined how infrastructure relates to future transportation technologies.

"There is going to be what I've been calling a mosh pit for the next 20 to 30 years," Winfree told the group. "There is conflict at the outset with all this new technology. It's simple human behavior versus digitized behavior, and how is that going to correspond? That's why there is a need for these vehicles to have the ability of situational awareness of other vehicles in the vicinity."

The symposium included speakers and panel participants from the U.S. Senate, U.S. Department of Transportation, Federal Communications Commission, American Automobile Association and Uber. ■

TTI's Talebpour, Texas A&M Student Team Place Second in AutoDrive Competition



Led by TTI Assistant Research Scientist Alireza Talebpour (far left), the Texas A&M University College of Engineering team, named The 12th Unmanned, placed second in the 2018 AutoDrive challenge sponsored by General Motors and the Society for Automotive Engineers.

Texas A&M University College of Engineering students recently placed second in the AutoDrive challenge sponsored by General Motors and the Society for Automotive Engineers, held in Yuma, Ariz. The competition ran from April 30 to May 5 and involved 40 Texas A&M engineering students led by TTI Assistant Research Scientist Alireza Talebpour, assistant professor of civil engineering at Texas A&M.

"I'm incredibly proud of my students," says Talebpour. "[They spent] day and night working on this car, and the team's success is a testament to their amazing work ethic."

Eight U.S. university teams competed in the challenge. Students are tasked to develop and exhibit the capabilities of an autonomous vehicle in multiple driving scenarios. On the obstacle avoidance course, Texas A&M's team achieved the fastest performance time while successfully detecting and avoiding obstacles.

"We couldn't be more proud of these Aggie innovators and hope to see some of them in transportation research careers in the future," says Christopher Poe, TTI's assistant director for connected and automated transportation strategy. ■



Getting Centered on the Big Picture

When I was assistant secretary for research and technology at the U.S. Department of Transportation, part of my job was to review proposals for the federal University Transportation Center grant program.

What I learned in that process is that a university-based center brings a number of unique strengths to the table: fresh ideas from the dynamic mix of practical and theoretical professionals, a natural outcome of the university environment; a matrixed research approach from multiple academic disciplines where the center is housed; and the freedom to think beyond a specific problem statement to the bigger picture of transportation issues.

It is important to note, however, that states also have an incentive to work with the academic community for innovation and solutions to challenges. The Texas A&M Transportation Institute (TTI) is home to five centers funded by the state of Texas. You've likely read their stories in this issue of the *Texas Transportation Researcher* already, so I won't list them all here. But each of them shares those characteristics I just mentioned.

TTI's Center for Transportation Safety (CTS), established in 2001, is a good example of how Institute thought leadership directs the discussion in Texas and beyond, in this case on the vital topic of transportation safety. As part of the Bloomberg Government's Next. series, I recently spoke on the challenges of human-technology interaction we'll face as connected-automated vehicles (CAVs) arrive in the coming decades. The unpredictability of human behavior and how to program CAVs to account for that might just be the most significant technological challenge of our lifetime. CTS is leading the TTI team recently selected by the National Highway Traffic Safety Administration for an indefinite delivery indefinite quantity contract to evaluate how vehicle-based systems affect driver behavior and performance. At the state level, center experts are helping the Texas Department of Transportation implement its Strategic Highway Safety Plan through an initiative titled Texas Together on the Road to Zero, which includes regional transportation safety workshops facilitated by CTS experts.

The Trump Administration has stated its commitment to update and upgrade U.S. transportation infrastructure. Yet there are less public funds to do that, so we have to figure out a way to do it smarter, more cost-effectively, and with longer-lasting results. That's the mission of the Center for Infrastructure Renewal (CIR), which held its ribbon cutting on April 11. The center represents a landmark of public-private cooperation never before seen in our country. TTI is partnering with the Texas A&M Engineering Experiment Station to manage CIR, which is more than merely a research center — it's a hub of forward-thinking exploration, analysis and testing that promises best-of-their-kind innovations to strengthen our nation's infrastructure.

Cross-cutting solutions, minds from multiple disciplines applied to problems, real-world educational opportunities for students, and a focus on the future — university-based state centers offer benefits unlike any other research entity. Whether it's studying unique issues of border trade and security, how drugs and alcohol impair drivers, or how seaports and inland waterways affect our economic vitality, TTI's centers find solutions — more than practical applications today, they'll help usher in a brighter, more prosperous and safer tomorrow. ■





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