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ON THE COVER: TTI’s 12 focus areas enable a matrixed approach to transportation research that helps our sponsors find interdisciplinary solutions to complex challenges arising from an increasingly interconnected transportation system.
The Oil and Gas Energy Sector in Texas (2018)

124,000
miles of transmission pipelines in Texas
(24% of the total mileage in the U.S.)

~50%
of U.S. drilling rigs located in Texas at any given time¹

1,076
number of new wells completed in October 2018²

7,713
number of new wells completed in Texas
(Jan.–Oct. 2018)

59%
increase of new wells completed in 2018
(compared to Jan.–Oct. 2017)²


See related story on page 10.
During the 92nd Annual Transportation Short Course on the Texas A&M University campus Oct. 15–17, Texas Department of Transportation (TxDOT) employees were challenged to address the enormous changes facing the Lone Star State from projected population and economic growth.

Short Course has been held at Texas A&M since 1926 and hosted by TxDOT’s partner, the Texas A&M Transportation Institute (TTI), since 1950. Nearly 2,600 TxDOT employees, researchers, consultants and public agency personnel attended this year’s Short Course, which is designed to share the latest transportation research and best practices from TxDOT-sponsored projects conducted by university-based agencies like TTI. It’s also the time that TxDOT honors its employees with achievement and safety awards.

“As we look at the many transportation challenges and opportunities before us, it is clear that the need for innovation is as strong as ever. To everyone at TxDOT, we promise to continue our commitment to serving you every day and helping you achieve your mission. We’ll ask the hard questions. We’ll seek the best solutions. And we’ll pursue the new innovations necessary to advance a safe, efficient and resilient transportation system for Texas.”

Greg Winfree  
TTI Agency Director

“Short Course is always a highlight of TTI’s year and an important and visible example of the continuing success of the TxDOT cooperative research partnership with the universities,” TTI Agency Director Greg Winfree said during the opening session. “This partnership, now 68 years old, remains the model for the rest of the country. It has led to innumerable transportation advances and innovations, not only for Texas but throughout the United States and the world.”

That partnership will be called upon numerous times over the next 30 years as TxDOT and TTI help prepare the state for a population boom, from 28 million Texans today to an estimated 54 million by 2050. The unprecedented growth will place increased demand on existing infrastructure, creating additional safety issues and a critical need to better manage current and future congestion. Texas already leads the nation in the number of roadway fatalities.
Because of this explosive growth, we need to focus on the most efficient and effective ways to move transportation projects forward,” said J. Bruce Bugg, chairman of the Texas Transportation Commission. “Now is the time to keep our promises to Texas voters to reduce congestion and improve mobility. The citizens of Texas have given us a vote of confidence, and we are ready to deliver. You are TxDOT, and together we are the TxDOT team.”

James Bass, executive director of TxDOT, told employees that safety is the priority for the agency going forward: “Something amazing happens when each of us has a personal stake in keeping the people we serve safe. When we do that, fewer people will die on the roads and more people will go home to their families at the end of the day.”

Winfree assured TxDOT employees that TTI is committed to helping TxDOT build and maintain the best and safest transportation system in the world.

“As we look at the many transportation challenges and opportunities before us, it is clear that the need for innovation is as strong as ever,” Winfree said. “To everyone at TxDOT, we promise to continue our commitment to serving you every day and helping you achieve your mission. We’ll ask the hard questions. We’ll seek the best solutions. And we’ll pursue the new innovations necessary to advance a safe, efficient and resilient transportation system for Texas.”

During the Short Course keynote address, former NASA astronaut Michael Fossum, who spent 167 days on the International Space Station in 2011, encouraged TxDOT employees to dream big for Texas.

“Footprints on Mars are the big dream for NASA,” Fossum explained. “What’s your big, audacious dream for TxDOT and the state of Texas? The challenges that you face are as big as the state of Texas. And this is the team to make [those dreams] happen.”

“Because of this explosive growth, we need to focus on the most efficient and effective ways to move transportation projects forward. Now is the time to keep our promises to Texas voters to reduce congestion and improve mobility. The citizens of Texas have given us a vote of confidence, and we are ready to deliver. You are TxDOT, and together we are the TxDOT team.”

J. Bruce Bugg, Chairman
Texas Transportation Commission

For more information, contact Terri Parker at (979) 862-8348 or t-parker@tti.tamu.edu.
Intersections are busy places, with passenger vehicles, trucks, buses, pedestrians and bicyclists all sharing space,” notes Texas A&M Transportation Institute (TTI) Executive Associate Director Katie Turnbull. “Transit stops are typically located near intersections, with boarding and alighting bus passengers joining other pedestrians crossing the streets. Bicyclists may also be transit riders, getting their bikes on and off buses, or traveling through intersections.”

Crashes involving transit vehicles, pedestrians and bicyclists are a concern in Texas and throughout the country. The 2013 National Transit Database reported 657 incidents involving transit vehicles, pedestrians and bicyclists in Texas. In addition to injuries and the tragic loss of life, these incidents have financial consequences. A 2017 pedestrian fatality in Seattle involving a bus making a right turn at an intersection resulted in a $7.7 million settlement.

“Making shared space safer for all users is the focus of the Texas Department of Transportation [TxDOT] Project 0-6875, Automated Vehicle/Connected Vehicle (AV/CV) Test Bed to Improve Transit, Bicycle, and Pedestrian Safety,” says Research Engineer Wade Odell, TxDOT’s manager on the project. “The safety of all road users, including pedestrians and bicyclists, is paramount to the department. This innovative research project examined using automated and connected vehicle technology to

Public transit vehicles, pedestrians and bicyclists share roads in urban, suburban and rural environments. Signalized intersections in urban areas represent complex shared spaces.

A supplemental bus sign above the pedestrian signal is illuminated, and an audio “Caution, Bus Turning” message in English and Spanish is provided if pedestrians and bicyclists are detected.
reduce and eliminate crashes involving buses, pedestrians and bicyclists.”

Turnbull and her research team held 25 meetings, four workshops and four roundtable forums in the first phase of the project to identify safety concerns when transit vehicles, bicyclists and pedestrians interact, and examined technologies to mitigate or eliminate those concerns. The research identified bus-turning movements at intersections as a safety risk for transit operators, pedestrians and bicyclists. In Phase 2 of the project, TTI researchers evaluated methods to warn pedestrians and bicyclists of turning buses at signalized intersections, and developed and pilot-tested a smart intersection using visual and audible alerts and a beta smartphone app. Researchers surveyed pedestrians at three intersections in Houston and conducted three focus groups with individuals using wheelchairs, transit riders with visual impairments, and individuals with hearing loss to gain further insights into preferred alert methods and messages.

TTI installed a state-of-the-art smart intersection at The Texas A&M University System’s RELLIS Campus to pilot-test the system. Econolite® — a private company that develops intelligent transportation system solutions — donated most of the signal control and detection equipment for the smart intersection. TTI supported construction of the intersection. The TxDOT project provided the first use of the smart intersection.

“The development of the smart intersection represents an excellent example of public- and private-sector collaboration to address key transportation safety challenges. The results from this project and the opportunities for ongoing research using the smart intersection will ensure that all road users benefit from AV/CV technology.”

Katie Turnbull
TTI Executive Associate Director

The application developed for the TxDOT project relies on a bus communicating with the traffic signal equipment using dedicated short-range communication, a radio frequency spectrum allocated by the Federal Communications Commission to support intelligent transportation systems. The smart intersection determines if the bus will be turning at the intersection based on information from a transportation management system and the bus route and schedule. Fisheye cameras and sensors allow the system to detect pedestrians and bicyclists waiting to cross at the intersection. A supplemental bus sign above the pedestrian signal is illuminated, and an audio “Caution, Bus Turning” message in English and Spanish is provided if pedestrians and bicyclists are detected. Researchers also developed and pilot-tested a beta version of a smartphone app.

“The development of the smart intersection represents an excellent example of public- and private-sector collaboration to address key transportation safety challenges,” says Turnbull. “The results from this project and the opportunities for ongoing research using the smart intersection will ensure that all road users benefit from AV/CV technology.”

The successful completion of the proof-of-concept test and a demonstration for the final roundtable forum on Oct. 23, 2018, wrapped up Phase 2 of the project. Participants at the roundtable forum also discussed potential Phase 3 deployment projects.
Car crashes remain the No. 1 cause of death and injury for young people. For most of the past decade, teen crash deaths in the United States were on the decline before the trend reversed in 2013. Over those 10 years, researchers in the Texas A&M Transportation Institute’s (TTI’s) Teens in the Driver Seat® (TDS) program—a peer-to-peer safety initiative—surveyed 109,266 teens at 281 schools in 11 states. What TDS found was enlightening and demonstrates a need for further research.

The results show a distinction between what young drivers think about safe-driving behaviors versus what they actually do. Teen drivers acknowledge the perils of texting or talking on the phone while driving, even as they cling to their devices behind the wheel. More than one-third of them say they talk or text “some” or “a lot” while driving. Texting while driving doubles a driver’s reaction time. So efforts to understand why they acknowledge the danger but also ignore it are vital.

“The part of the brain responsible for higher-level decision-making isn’t fully developed until age 25, so knowing something is dangerous isn’t enough,” says TTI Associate Transportation Researcher Lisa Minjares-Kyle of TTI’s Youth Transportation Safety Program. “While novice drivers can recognize risk, they may feel immune to it or that they’re more than capable of handling it.”

Although alcohol is a factor in only about 12 percent of fatal crashes involving 16- to 17-year-old drivers, young drivers identify driving intoxicated as their...
greatest road-safety threat. Only about 1 in 10 teens admit to drinking and driving, and more than 80 percent say they never combine those activities.

So, why do young drivers’ perceptions of the alcohol risk seem to exceed the reality while ignoring other real dangers, like texting while driving?

“A strong prevention culture that has helped to establish alcohol- and drug-impaired driving as socially unacceptable is part of the answer,” Minjares-Kyle says. “And yet research shows other behaviors present an even greater danger to teen drivers.”

It’s been acknowledged for years that teen passengers in a vehicle raise the crash likelihood for teen drivers. In a 2005 Temple University driving simulation study, young adults were about 50 percent more likely to make riskier decisions in the presence of friends, and adolescents were more than twice as likely to do so. Fully half the teens surveyed by TTI say they drive with teen passengers “some” or “a lot.”

Nighttime conditions present another, particularly dangerous situation for novice drivers. The Centers for Disease Control and Prevention’s data show that one-third of teen crash deaths happen between 6 p.m. and midnight. Roughly that same percentage of the teens surveyed by TTI acknowledge they routinely drive during those hours.

To some extent, new technologies can help mitigate these risks. Automated driving can deliver on the lofty promise of substantially safer travel, but it will likely be at least 20 years before results can be seen on a broad scale. To significantly decrease teen driving deaths in the next 10 years, finding and aggressively implementing alternatives is necessary.

One area of improvement, Minjares-Kyle says, is expanding the topics addressed by public outreach campaigns beyond drinking and driving. Speeding, nighttime driving, and passenger distraction all cause more crashes for young drivers than alcohol impairment, but drunk driving gets some of the largest public service-campaign funding. Providing additional support for programs and campaigns that address other dangerous behaviors is one path to effecting positive outcomes.

Another approach is to apply non-transportation public-health methods. Efforts to treat obesity, for instance, rely on small steps like portion control, breaking behavior intervention down to do-able steps. For teens, cell phone use is more than just a habit — it’s a functional addiction. Breaking that cycle so the dependency isn’t so overpowering when they get in a car should be a priority.

In Texas, the growth of TDS coincided with a multi-year decline in teen-driver fatal crashes (yet Texas, too, has seen an increase in teen fatalities in recent years). States can invest more to help channel the force of positive peer pressure more effectively as another strategy to reducing teen driving fatalities.

“Americans have come to accept a certain number of roadway crashes and deaths as a daily norm, the price a modern society pays for the convenience of mobility,” Minjares-Kyle says. “We can stop paying that price, but only if and when we choose to do so.”

For more information, contact Lisa Minjares-Kyle at (713) 613-9211 or l-minjares@tti.tamu.edu.
Your car’s next tank of gas is on its way to you. You can be assured of that, even though the journey it takes to get there is a sometimes arduous one.

That journey could begin at one of hundreds of active oil wells in Texas, located predominantly in remote rural areas. Crude oil extracted from those wells is then transported to faraway refineries and on to often farther-away gas stations. Much of the transport relies on a huge web of pipelines, but the state’s rural highway network is another critical link in the path to the pump.

Our almost unquenchable thirst for fuel has delivered great news on the job front, but it has also required rural highways to work overtime. Those roads are seeing far higher and heavier levels of traffic than they were designed to handle, not only from oil transports but also from the myriad vehicles that support drilling operations.
That path has sometimes been bumpy — literally and figuratively — thanks to a state that’s grown at a blistering pace, coupled with a robust energy industry. Improved production efficiencies, sustained high crude oil prices and rapid population growth have converged, yielding greater quantities of available gasoline and diesel, and more Texans in more cars and trucks eager to use it.

Our almost unquenchable thirst for fuel has delivered great news on the job front, but it has also required rural highways to work overtime. Those roads are seeing far higher and heavier levels of traffic than they were designed to handle, not only from oil transports but also from the myriad vehicles that support drilling operations. The result is big-city gridlock in rural locales.

That’s unlikely to change anytime soon. In fact, the Permian Basin could nearly double its crude oil output by 2023, according to a recent report by IHS Markit, an industry research group. If that happens, one single region of Texas would rank third worldwide in production, behind only Saudi Arabia and Russia.

Thankfully, both public- and private-sector players are working like never before to keep the path from the oil patch to the pump as clear and pothole-free as possible. The industry is working with local leaders and the Texas Department of Transportation (TxDOT) to find innovative solutions. Some of their collective thinking, it turns out, may provide a model for addressing urban traffic challenges.

Producers are providing insight into changing truck travel to match advances in energy development techniques, as well as potential new locations for drilling in the coming years. For instance, improvements in energy development or extraction techniques can require more trucks for construction or hauling sand and other products. Understanding those changes and having two to three years’ lead time on new drilling locations make it possible to account for things like the number and magnitude of heavy trucks needed to support drilling activity, and to shore up and improve the roads before that new heavy traffic arrives.

Engineers are reducing gridlock and moving more traffic in ways that sometimes run counter to familiar patterns, like converting an existing two-way frontage road to one-way traffic or using temporary bypass lanes until a needed overpass is built. The Texas A&M Transportation Institute (TTI) is using advanced data tools to identify travel patterns and new designs to mitigate congestion.

Safety experts at TxDOT and TTI are studying where and how more frequent commercial vehicle crashes are happening. What we learn can help the energy industry introduce programs and policies that help to address driver behavior issues (like excessive fatigue).

The energy sector is, of course, vital to the Texas economy. It’s big. More than 200,000 jobs big. More than 800 million barrels of oil a year big. Billions in tax revenue for state coffers big.

It’s also personal. The security of our jobs and the safety of our families on the road are ultimately most important.

That’s why energy producers and TxDOT will keep working together (particularly in rural Texas) to help ensure that your car or truck — and your state — will never be at risk of running on empty.
Plastic or paper. Decaf or regular. Cash or credit.

Consumers make choices every day. Whether it’s about how we shop, how we dine, or how we purchase goods and services, most of our decisions are pretty straightforward. We know what we want, and we know why. When it comes to how we commute, however, things aren’t so simple, according to ongoing research at the Texas A&M Transportation Institute (TTI).
Traveler use of managed lanes should be based on a logical assumption that drivers will weigh the benefits of reduced travel time against the cost of a toll. In theory, they will consider the options and make a conscious choice of whether to use the general purpose lane (GPL) or the managed lane (ML). This choice is the foundation of travel models that predict the use of toll roads or managed lanes. However, the models require that travelers adhere to a traditional economic concept of rational choice — that they act in a way to serve their own best interests. The problem is humans don’t always behave rationally.

That helps explain what Mark Burris — a professor of civil engineering at Texas A&M University and TTI research engineer — found in examining more than two years of trip data on the Katy (I-10) Freeway in Houston. That stretch of I-10 has four toll lanes that allow high-occupancy vehicles to travel free of charge during much of the day, while single-occupancy vehicles must pay to use the lanes.

Burris found that approximately 82 percent of travelers seem to be sticking with long-established patterns of travel behavior. Over the two-and-a-half-year period, some 79 percent of travelers used GPLs for all their Katy Freeway trips, and about 3 percent consistently chose MLs for all their Katy Freeway trips — regardless of congestion levels or toll charges.

“At some point before the period examined in the project, travelers made a choice about which lanes to use. But they appear to not be changing their travel behaviors using available information on costs and congestion levels.”

Mark Burris
Professor, Texas A&M Civil Engineering Department
TTI Research Engineer

their choices on rational economic considerations, nor were their actions illustrating any sort of patterns reflecting congestion and toll levels. The kind of results we would expect didn’t occur.”

The lane-use volumes were drawn from data on millions of individual trips recorded by transponders. Unique random ID numbers were assigned to all transponders to ensure the data were anonymized and that no vehicle owners could be identified.

A sample that large increases the confidence associated with trip patterns. It does not, however, offer insights into traveler choices and factors influencing those choices. Perhaps the drivers didn’t fully understand how the MLs operate, Burris and his colleagues posit, or maybe they’re simply creatures of habit.

Understanding how drivers compare alternatives and assign values to make their travel choices is important to agencies making informed infrastructure investment decisions. To gain such insights, Burris has fielded a multidisciplinary team that includes psychologists and economists to support a new four-year study, Using Behavioral Economics to Better Understand Managed Lane Use, sponsored by the Federal Highway Administration.

Beginning with surveys and continuing with lab experiments, the team hopes to identify the psychological traits that might influence someone to choose or not choose to use the MLs. For example, simulated driving tasks will involve choices based on variable payoffs that change slightly from day to day. A driving simulator will also be used to test research participants’ responses to different cost and travel-time saving options. Later in the project, hypotheses will be tested on travelers using one ML facility in Dallas, Texas, and another near Washington, D.C.

One concept of behavioral economics holds that people might find a more direct and easy path to rational decision making if the decision environment is restructured in some way. In other words, they can potentially be nudged into making wiser choices.

“We hope to communicate with our research volunteers in ways that influence them to more thoughtfully consider their options and become conscious choosers,” Burris says. “Our ultimate goal is an improved method for estimating ML use based on how travelers really behave — not the rational behavior model that seems inadequate when capturing true travel behavior.”

For more information, contact Mark Burris at (979) 845-9875 or mburris@civil.tamu.edu.
The U.S. Department of Homeland Security (DHS) has awarded the Texas A&M AgriLife Research Institute for Infectious Animal Diseases (IIAD) a 10-year grant to lead its new Center of Excellence for Cross-Border Threat Screening and Supply Chain Defense. The Texas A&M Transportation Institute (TTI) is part of the interagency Texas A&M team.

“Texas A&M looks forward to bringing together its expertise in many disciplines across the A&M System to deliver new, innovative technologies to reduce the risk of biological threat introduction across U.S. borders,” says Texas A&M University System Chancellor John Sharp.

The grant awarding the new center to the university was announced Oct. 1 and will include $3.85 million in funding for the first year. Joining TTI in the new center are A&M System team members:

- Texas A&M AgriLife Research and Extension Center at Weslaco,
- Texas A&M School of Public Health,
- Texas A&M Health Science Center,
- Texas A&M College of Veterinary Medicine,
- Texas A&M Engineering Experiment Station,
- Texas A&M Engineering Extension Service, and
- Texas A&M at Galveston.

Other project partners include The University of Texas Medical Branch at Galveston, the University of Washington, IBM Research, Quidel, Host Response and SunQ.

Led by Melissa Berquist, director of IIAD, the center will focus on:

- developing and deploying technologies and methods to better detect biological threats,
- establishing novel analytics through better integrating disparate data sources,
- leveraging private-public partnerships to improve training for Homeland Security Enterprises personnel, and
- implementing next-generation methods and containment techniques for isolating dangerous pathogens to support time-critical responses by DHS.

“TTI’s previous research, demonstration projects and deployments, along with the Institute’s strong working relationship with U.S. Customs and Border Protection [CBP] and other stakeholders, contributed to the success of the proposal,” states TTI Executive Associate Director Katie Turnbull.

Established relationships with DHS, CBP, the Federal Highway Administration, and various state departments of transportation provide TTI with a unique understanding of the strengths and weaknesses of the U.S. transportation network. For the center, TTI’s research will use a combination of blockchain technology and sensors to create an immutable, auditable and traceable supply chain of data to trace product movement.

“I can think of no better example of the benefits of well-coordinated, applied research than the DHS Centers of Excellence,” states TTI Agency Director Greg Winfree. “The centers break down silos, step across organizational boundary lines, and encourage team members to work together. TTI is proud to be a part of this new center, and we look forward to working with our partners to better protect Americans nationwide.”

For more information, contact Katie Turnbull at (979) 845-6005 or k-turnbull@tti.tamu.edu.
ENSURING THAT ASPHALT BINDERS don’t contain too many contaminants can be key to ensuring a longer-lasting roadway. The Texas Department of Transportation (TxDOT) is implementing use of an innovative technology in a new test method and updated specifications developed during a two-year study conducted by the Materials and Pavements Division of the Texas A&M Transportation Institute (TTI).

The paving industry routinely uses a variety of materials to produce and modify asphalt and seal-coat binders. A 2016 Asphalt Institute report estimated that nearly 160,000 tons of re-refined engine oil bottoms (REOBs) go into asphalt mixtures in the United States every year. As standard practice, most asphalt binders today still meet the requirements of the performance grade (PG) specification, despite relatively small amounts of these additives.

Transportation agencies, including TxDOT, have recently noticed premature failures of newly constructed pavements. Along with distresses — such as temperature cracking and raveling, aggregate loss, and instances of total surface course loss within five years — pavement engineers have had concerns about embrittlement and a lack of adhesion and tackiness of the asphalt and seal-coat binders. Suspecting that REOB might be contributing to the problem based on laboratory testing, TxDOT contracted Project 0-6881, Recycled Engine Oil Bottoms and Poly-phosphoric Acid in Texas Binders, with TTI to verify the acceptable levels, and to find efficient and accurate ways to test for it.

TTI researchers conducted a review of 30 years of literature on the impact of REOB on asphalt binders, asphalt mixtures and seal-coat performance. From extensive laboratory testing and analysis of multiple sources of binders and REOBs, the team then developed and verified scientific methods to detect and quantify the amount of REOB used in both asphalt binders and hot-applied seal-coat binders. The new lab test methods require using either a handheld or a benchtop x-ray fluorescence (XRF) instrument in a simple process.

XRF spectrometry is an analytical method to determine the chemical composition of materials, whatever their form (solid, liquid, etc.). XRF can also sometimes be used to determine the thickness and composition of layers and coatings. The XRF testing detects the presence and the intensities of some key elements that reveal whether REOB exists and estimates the amount in the binder being tested.

“The method is fast, accurate and non-destructive, and usually requires only a minimum of sample preparation,” says Research Engineer Fujie Zhou, TTI’s lead on the project. “The precision and reproducibility of XRF analysis is very high. It’s almost like taking a fingerprint of the asphalt binder. The analysis time after the measurement is only a few seconds.”

The lab tests done over the course of the project confirmed that adding more than 5 percent REOB by weight of total binder can negatively impact the rutting and cracking resistance of asphalt mixes. A similar result was found for seal coats. Researchers also found that binders produced with the same target PG but with different modification techniques can have quite different flow and embrittlement properties.

“For more information, contact Fujie Zhou at (979) 458-3965 or f-zhou@tti.tamu.edu.
Being able to teach students about this real-world application of science is made possible through funding from the Safety through Disruption (Safe-D) University Transportation Center, a consortium that includes researchers from the Texas A&M Transportation Institute (TTI), Virginia Tech Transportation Institute and San Diego State University.

TTI Research Engineer Melisa Finley worked with a science teacher from Allen Academy in Bryan, Texas, to develop the curriculum after years of putting on retroreflectivity demonstrations for school children. “Showing kids the scientific principles of light and retroreflectivity always seems to motivate and inspire them. Their eyes get big when they can see firsthand how it all works. It helps to open the world of science to them,” Finley explains.

Teachers interested in obtaining the curriculum and materials can request a materials kit by going to the Safe-D website, https://safed.tti.tamu.edu/k-12-teacher-resources/. The webpage contains downloadable lesson plans for teachers, presentation slides and links to teacher training videos.

“We’re excited about supplying everything teachers need for the curriculum at no cost,” Finley says. “We think that this unique project will help inspire students about the science associated with transportation safety.”
**TTI Travels to Africa for Transportation Improvement Expedition**

TTI Agency Director Greg Winfree, Assistant Director Joe Zietsman and Associate Research Engineer Tara Ramani met with Namibia’s Roads Authority in October to outline future work the Institute will conduct for Namibia and hold a workshop with the Roads Authority’s senior leadership. TTI also met with senior leadership of the U.S. Embassy in Namibia, who are enthusiastic about promoting and facilitating the Namibia/TTI relationship. The visit is a follow-up on a Road Transport Sustainability Plan TTI developed for the country five years ago.

Though Namibia’s roads are considered the best on the African continent, the country has numerous transportation-related issues it wishes to address. For example, Namibia’s traffic fatality rate is among the highest in the world — partly the result of speeding and wildlife crashes. Beyond traffic safety, the country wants to do everything possible to preserve its pristine environment.

“We have a great opportunity to help Namibia solve some of its unique transportation problems,” Winfree says. “I think it could lead to similar relationships with other African countries.”

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**Port Community of Veracruz Launches Blockchain Initiative to Improve Operations**

TTI researchers are teaming with dexFreight, a Florida-based blockchain and logistics startup, to test an innovative application of blockchain technology at the Port Community of Veracruz, Mexico. The project will help define blockchain applications for improving the safety and security of freight transportation within port communities. The project will be led by Rajat Rajbhandari, CEO and co-founder of dexFreight, and Juan Carlos Villa, TTI senior research engineer.

“The project and the Port Community system are critical in improving trade efficiency at the port and being competitive,” explains Baruc de la Fuente, administrator for Veracruz Customs. “The aim...is to reduce the time and effort it takes to securely export and import containers through the port and provide much better service to the customers.”

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**Stockton Promoted to TTI Agency Deputy Director**

On Nov. 14, 2018, TTI Agency Director Greg Winfree promoted TTI Executive Associate Agency Director and Senior Research Fellow William R. Stockton to agency deputy director. With more than three decades of service to TTI in various leadership positions, and more than 44 years in public service, Stockton has held virtually every engineering research position in the Institute and served in multiple executive management roles. As part of his new duties, Stockton will also serve as TTI’s chief operating officer, supporting the agency’s mission by assisting in planning, coordinating, and evaluating administrative and programmatic operations and leading or supporting other initiatives as needed.

“I am humbled in the confidence Greg has shown in me and pledge to wholly commit to working with my valued colleagues throughout the Institute to ensure that TTI remains an international leader in transportation research,” Stockton says.
Tooley Receives Prestigious ARTBA Lifetime Achievement Award

Melissa Tooley, TTI senior research engineer and director of external initiatives, received the Ethel S. Birchland Award Oct. 1 in New York City at the American Road and Transportation Builders Association (ARTBA) national convention. Named after ARTBA’s executive director in the mid-1920s, the award recognizes women who have “demonstrated outstanding leadership and long-term service in the transportation design and construction industry’s public or private sectors. Particular focus is given to the individual’s dedication to the advancement of innovation and other women leaders.”

Tooley, who supports, mentors, and advances women leaders in the transportation industry, has created numerous successful and beneficial transportation education and research programs and initiatives, at both the state and national level, in her more than 30-year career.

“I am humbled by this award — there is no greater honor than recognition by one’s peers,” Tooley says. “The ARTBA Women Leaders Council spotlights women’s achievements in transportation, and I am thankful that ARTBA is so supportive of women in transportation construction, design and research.”

Self-Driving Vehicles Begin Operating in Downtown Bryan, Texas

On Oct. 31, 2018, Mayor Andrew Nelson of Bryan, Texas, and Chancellor John Sharp of The Texas A&M University System introduced members of the media to two self-driving trolleys in downtown Bryan. The six-person vehicles were developed by Srikanth Saripalli, TTI associate research scientist and associate professor in Texas A&M’s Department of Mechanical Engineering. Saripalli and his students monitored the vehicles’ initial deployment.

“TTI is the best transportation research organization in the world,” Sharp told the crowd. “Greg Winfree [TTI agency director] and his folks are always on the cutting edge of things.” Mayor Nelson, Chancellor Sharp, Director Winfree and Dean of Texas A&M’s College of Engineering M. Katherine Banks rode the trolleys for the unveiling.

The first autonomous trolley in downtown Bryan, Texas, was assembled by TTI Associate Research Scientist Srikanth Saripalli and his students.

TTI Hosts FHWA’s Sustainable Pavements Technical Working Group

Hosted by TTI, the Federal Highway Administration’s (FHWA’s) Sustainable Pavements Technical Working Group met at The Texas A&M University System’s Center for Infrastructure Renewal, located at the A&M System’s RELLIS Campus, Oct. 30–31. The group’s stated purpose is to “provide technical input to the FHWA on sustainability and environmental aspects of pavements and materials and to serve as a forum for information sharing and exchange.”

“Refurbishing the nation’s existing infrastructure cost-effectively and building new facilities to meet future mobility demands in a smarter, more sustainable and environmentally friendly way are essential to the healthy evolution of our transportation system,” states TTI Executive Associate Director Jon Epps, head of TTI’s Pavement, Materials and Constructed Facilities Group. “Opening up communication among the academic, private and public sectors can help make that happen.”
Out of that fierce competition came the decision-making process that guided our country through the Civil War.

As Lincoln’s genius demonstrated, innovation is as much about process as it is product. In our business, how we conduct transportation research is just as important as our results. I’m not talking just about methodology or equipment or procedures; I’m also talking about the importance of the human factor in the equation.

Traditionally, transportation research has been divided into logical disciplines — pavements or traffic operations or safety or economics, to name a few. Separating these disciplines makes sense from an investigative perspective. It enables experts to hyper-focus on a particular problem from a particular angle. The downside is that doing so can lead to myopia that, over time, can limit our vision.

When it comes to study approaches, thinking of transportation research in four-dimensional terms is still a relatively new concept. How can we account for environmental impacts when we design roads? How do we program intelligent transportation algorithms to maximize safety? An autonomous vehicle (AV) can think faster than a human and without emotion, but should it overrule human judgment?

It would be difficult for any single research area to completely answer questions like these. But bringing multiple viewpoints to bear on a problem can create a resilient, responsive and robust solution that’s longer lasting and more cost effective and provides the safest solution possible. The whole can yield benefits greater than the sum of its parts.

Expertise at the Texas A&M Transportation Institute (TTI) spans 12 specific focus areas. Though somewhat topically traditional — economics, environment, mobility, etc. — our matrixed approach to research encourages shared thinking across disciplinary lines. Naturally, each expert on a project champions his or her specialty — no one knows it better, after all. At TTI, we encourage healthy competition among teams, enabling the best ideas to become the best solutions.

Need to measure how extreme weather events reduce pavement life? We’ve got you covered. How should public policy reflect the capabilities and limitations of AV technology to optimize safety? We can help you figure that out. In fact, TTI offers 240 million different possible combinations of expertise based on our 12 crosscutting focus areas. So, what question do you need answered?

We’ve got a team for that.
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