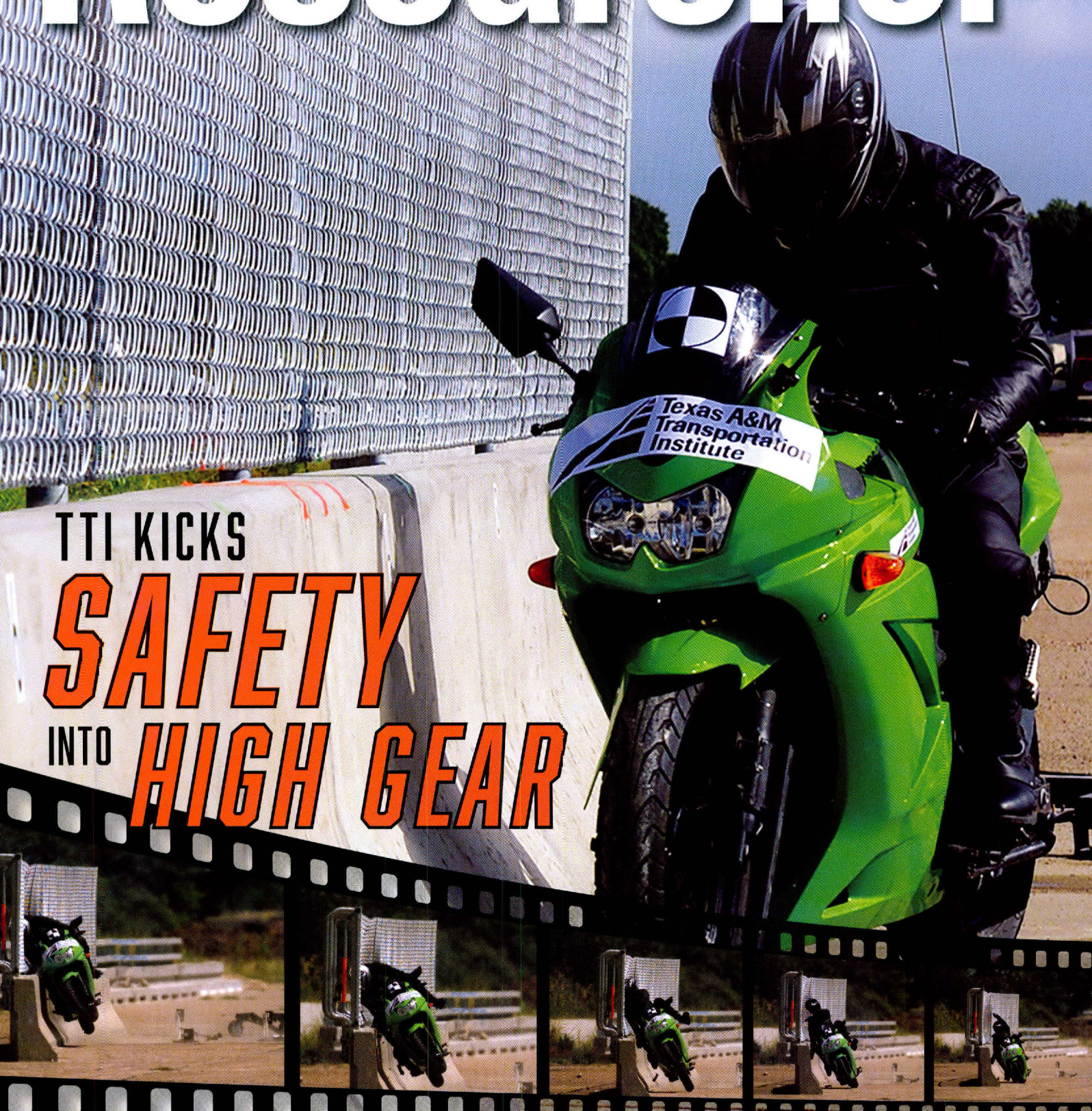


TEXAS TRANSPORTATION

VOL. 56 | NO. 2 | 2020

Researcher

TTI KICKS
SAFETY
INTO **HIGH GEAR**

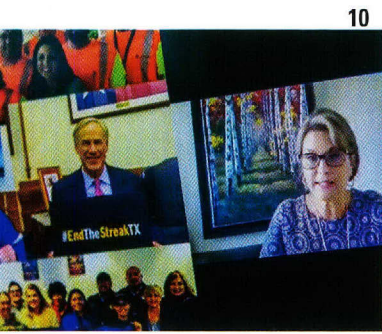


TEXAS TRANSPORTATION Researcher

VOL. 56 | NO. 2 | 2020

ON THE COVER: The Texas A&M Transportation Institute (TTI) studies all aspects of transportation safety — from improving roadway design and changing driver behavior (to help avoid crashes whenever possible) to developing roadside devices that mitigate injuries and fatalities when crashes happen. The Institute celebrated its 70th birthday in June 2020 and 70 years of research innovation and implementation that have saved “countless lives throughout Texas and the nation” (Texas A&M University System Chancellor John Sharp).

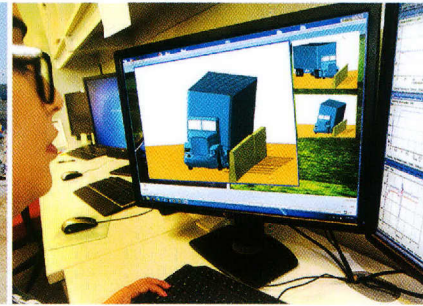
Photos courtesy Richard Badillo, TTI.



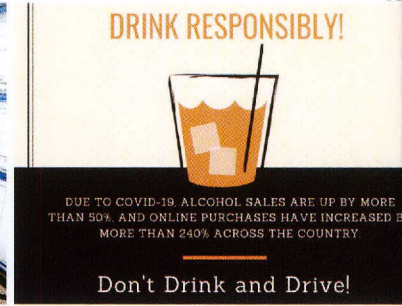
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TEXAS'

Seven Deadly Safety Stats*



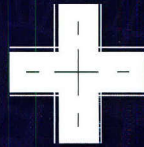
45% occurred with roadway and lane departure.

1



39% involved impaired driving.

2



23% occurred at intersections.

3



22% involved speeding.

4



16% involved pedestrians.

5



14% involved distracted driving.

6



14% involved older drivers.

7

* Statistics are relative to all Texas traffic crash fatalities (2010–2016) and taken from the Texas Strategic Highway Safety Plan website (<https://www.texasshsp.com/>).

what we're
THINKING

Melissa Tooley

Teleworking — *THE NEW NORMAL?*

WHEN COMPANIES ACROSS THE COUNTRY recently announced new work-from-home policies in response to COVID-19, the news sent employees and companies alike into a tailspin, creating hardships for many. Workers scrambled to retrieve computers, files and supplies from their workplace and identify a space at home to work; IT departments hustled to assist employees with connectivity and virtual meeting capabilities; and leaders of companies with more traditional cultures wondered if any work would get done at all.

However, none of these issues applied to my household. My husband and I simply walked downstairs, entered our offices, and got to work.

I have teleworked in my position at the Texas A&M Transportation Institute since 2015 and with a previous employer from 2000 to 2007. My husband pioneered telework for AT&T in 1991, when he volunteered for an AT&T telework initiative and sent his entire staff to work at home. Although no longer at AT&T, he has worked from home ever since in the telecommunications industry.

The benefits of the home office greatly contribute to our overall quality of life. Our jobs are demanding, and we have our files and computers accessible to us when we need them, which in our case is often



THIS ARTICLE WAS ORIGINALLY PUBLISHED IN THE ARKANSAS DEMOCRAT-GAZETTE MAY 3, 2020.

outside normal work hours. We are able to balance our personal and professional lives much more easily than when we were both working in a company-based office.

During the COVID-19 shelter-in-place orders, working parents have suddenly found themselves juggling work responsibilities with homeschooling and childcare. While we were raising our daughter, we found it easier to manage doctors' appointments and school or athletic events when we worked from home and could easily return to our home office afterward. If she got sick, it was less disruptive than if we had to stay home from a company-based office. These benefits would also be realized if one is responsible for the care of other family members.

Reduced congestion from teleworking benefits those who can't telework as well. Commuters can expect shorter travel times; shippers of medical supplies, groceries and other goods enjoy a more unobstructed delivery path; and first responders can handle emergencies more quickly and efficiently.

Pet owners can more easily accommodate vet visits, daily walks and other pet needs. Household management is facilitated as well because usually one of us is home to meet individuals for home repair and other services and to receive deliveries. Exercise can be more easily incorporated into the daily routine, and access to fresh food in the kitchen can result in better nutrition and health.

There are more tangible financial and time-saving benefits as well. For example, our dry cleaning and transportation costs have reduced. Perhaps most importantly, teleworking saves time that can either be spent with loved ones, meeting work deadlines, or doing whatever provides the most benefits on a given day. In a traditional office scenario, the time spent getting ready to go to work, commuting, making a lunch, or going out for lunch adds up quickly and can total hours a day. There are also fewer distractions from chatty co-workers and impromptu meetings.

As a transportation professional, I know teleworking on a big scale has other benefits. Roadways are less congested, the air stays a little cleaner, and we waste less fuel when vehicles aren't creeping along bumper to bumper. Consider also that vehicles staying in driveways and garages don't get into crashes, so there's a public health bonus.

Reduced congestion from teleworking benefits those who can't telework as well. Commuters can expect shorter travel times; shippers of medical supplies, groceries and other goods enjoy a more unobstructed delivery path; and first responders can handle emergencies more quickly and efficiently.

Granted, there are inherent challenges to teleworking. Teleworkers need to be self-motivated, responsible and focused. Technology must be readily available for videoconferencing, with access to online resources. Designated spaces for offices are imperative, and

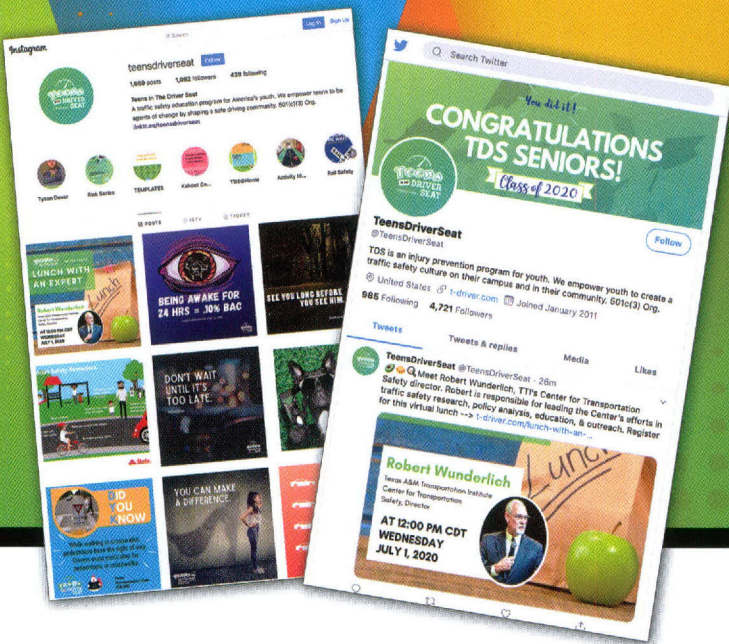
separate home offices furnished with office furniture for each remote employee work best. Creative approaches to modify spare rooms or other areas can also create functional workspaces. To avoid feelings of isolation, a plan should be in place to connect with co-workers on a regular basis. This can be accomplished with regular video calls with team members.

Because teleworkers are home all day, utility bills are higher, and more resources like that precious toilet paper, groceries and computer bandwidth may be needed. However, some of these costs are offset by the tax exemption that can be claimed for a home office.

Not all workers have the same work styles, but differences can be accommodated. My husband and I are *blenders*, meaning that we routinely blend our personal and professional lives. For us, having our offices at home greatly facilitates our lifestyle. But others are *separators* who like to draw a distinct line between work and home life. Separators may have misgivings about working at home, but these may be addressed by having a home office with a door that can be closed at the end of the day and an established work schedule.

We may find at the end of this national experiment in teleworking that brick-and-mortar facilities are not as essential as we once thought they were. For industries that can accommodate teleworking, this may result in a paradigm shift — a new normal, which has the potential to improve the quality of life for many American workers and their families, while also enhancing productivity. It certainly has for us. ■

DR. MELISSA TOOLEY, P.E., is a senior research engineer and director of external initiatives at the Texas A&M Transportation Institute. She is a graduate of the University of Arkansas and a member of the Arkansas Academy of Civil Engineering, and works in her home office in Little Rock, AR.



YTS PROGRAM ADAPTS YOUNG DRIVER OUTREACH FOR ONLINE LEARNING

The Texas A&M Transportation Institute's (TTI's) Youth Transportation Safety (YTS) program — part of the Institute's Center for Transportation Safety — is active in schools and communities across the country. The program supports peer-led road safety education and outreach to encourage young drivers to practice safe driving behaviors.

When schools closed during the COVID-19 pandemic, fulfilling that mission became significantly more difficult. The YTS team found creative ways to produce innovative content that still reaches their target audiences — teen- and college-aged youth — by transitioning their message to a virtual environment.

Before the pandemic, YTS staff would typically give presentations in schools, providing hands-on education activities about traffic safety. This spring, the team turned to YouTube, creating TDS Talks, a YouTube video series emphasizing the top teen driver risks. At less than 15 minutes each, the videos serve as primers for traffic safety best practices.

YTS staff also used social media, where youth spend most of their time. Their strategy focused on engaging (and providing transportation safety information to) students, parents, teachers and safety partners by facilitating easy ways to share content with others. On April 9, for example, Teens in the Driver

Seat® (TDS) — a YTS program that empowers teens to change unsafe behaviors through positive peer pressure — hosted a pedestrian and bicycle Twitter chat using the hashtag #CallingAllRoadUsers. This chat focused on pedestrian and bicycle safety, and enabled teens to learn from experts in the field. TDS held a second Twitter chat on April 21 focused on big rig and bus safety using #RespectTheRig. Both chats were well received.

TDS further expanded its efforts using Instagram TV (IGTV) to deliver weekly program updates, educational videos and motivational messaging to teens. Along with IGTV, TDS is producing weekly Instagram story challenges and messaging adapted for Internet delivery. The YTS team developed trivia challenges using Kahoot!, a trivia

platform for students, that offer fun educational opportunities highlighting impaired driving and top driving risks. The team also prepared a Pedestrian and Bicycle Safety Digital Learning Toolkit, among other innovative materials, to share with target audiences. The YTS team produced similar virtual learning materials through their U in the Driver Seat program aimed at college-aged constituents.

“Despite the challenges we’ve all faced during the pandemic, YTS staff are working hard to ensure young drivers, their parents and our safety partners continue to receive reliable information in a timely way to help reduce the number of crashes involving young drivers,” explains TTI Senior Research Engineer Russell Henk, YTS program manager. “Now our audiences can learn how to drive safely from the comfort of their own homes.” ■

Youth Transportation
SAFETY
 PROGRAM
 y-driver.com



For more information, contact **Russell Henk** at (210) 321-1205 or r-henk@tti.tamu.edu.



REDESIGNED

LookLearnLive.org

Expands Content, Improves Usability

When Texas A&M Transportation Institute (TTI) Senior Research Scientist Michael Manser sought a redesign of LookLearnLive.org, his number-one priority was to improve its usability as a resource for stakeholders in motorcycle safety. The site supports the safety and awareness campaign developed by TTI, the Texas Department of Transportation and the Texas Department of Public Safety to reduce the number of motorcycle crashes, injuries and fatalities on Texas roadways.

Along with an aesthetic overhaul, the site now has new and enhanced usability features and other significant improvements. While the new look might be the first thing a user notices, it's the easy access to information that will pay dividends down the road, hopefully in the form of fewer crashes. The previous version of the website served as a repository of select content, which was sometimes difficult to find on the old site.

"The website redesign was a significant step in making sure we better serve motorcyclists by providing them an easy way to access content and resources," says Manser.

For example, all Texas Motorcycle Safety Coalition (TMSC) past meeting agendas, minutes and materials, and information on upcoming meetings are available on the new site. Videos demonstrating safe riding practices are viewable, and users can also find materials from the Motorcycle Safety Forum, the annual meeting where coalition stakeholders gather to discuss the latest in motorcycle safety.

"The website redesign was a significant step in making sure we better serve motorcyclists by providing them an easy way to access content and resources."

Mike Manser

TTI Senior Research Scientist and Human Factors Program Manager

TMSC meetings are open to motorcyclists from all over the Lone Star State. However, before the site redesign, access to the meetings was limited to those who could attend in person. Now, motorcyclists will have one-click access to join TMSC meetings from anywhere in Texas. This is one way the redesign provides an opportunity for more riders to join and be active with the coalition.

"I would like to thank my fellow TTI employees Vicky Nelson, James Moughon, Jamie McKinnerney, Chris Bratlien and Laura Higgins," says Manser. "Their hard work has resulted in a wonderful LookLearnLive.org website that is easy to use and contains content that will be valuable to riders and help make Texas roads safer." ■



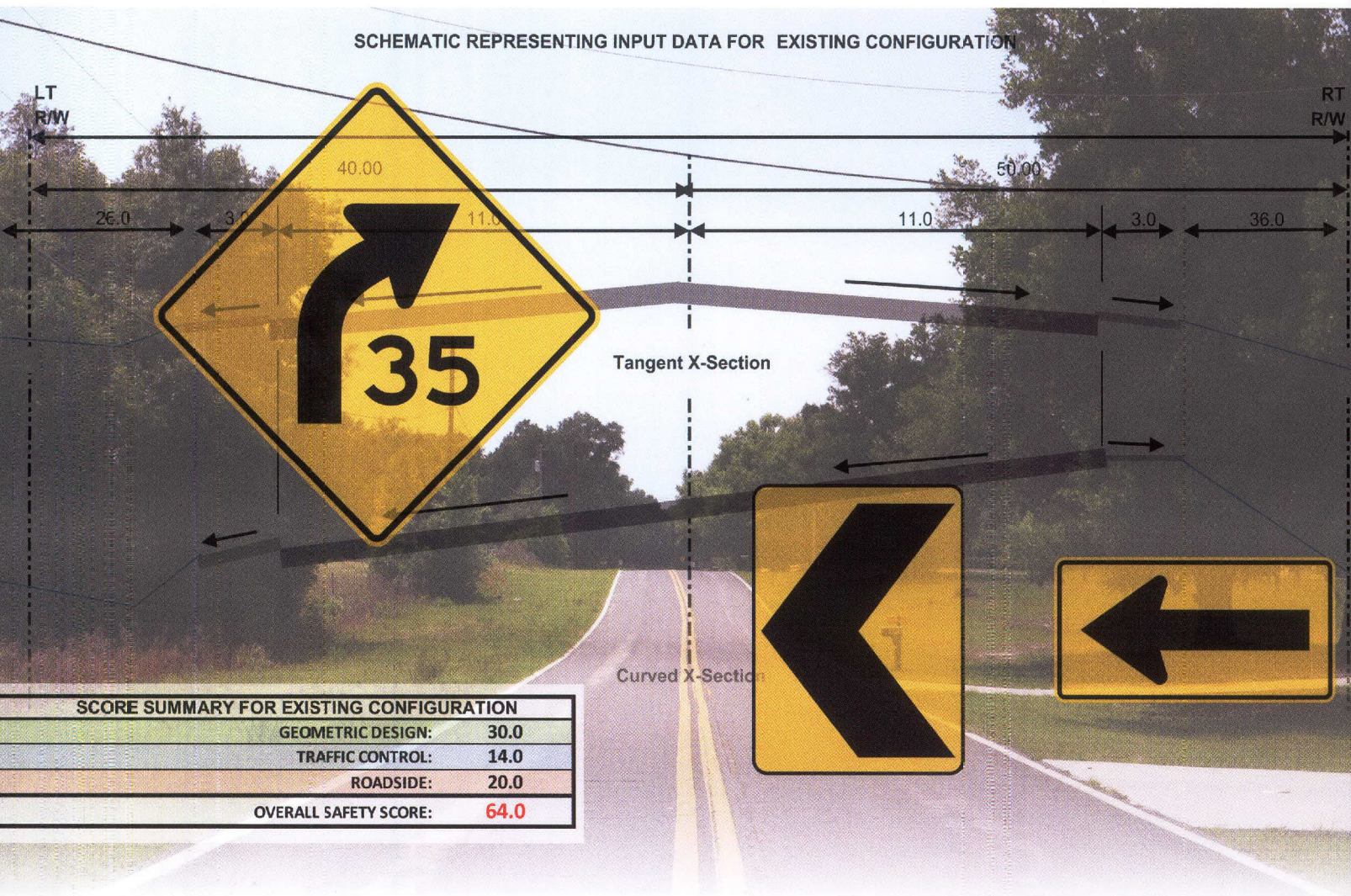
The redesigned website will soon be live at <https://www.looklearnlive.org/>.

**Promoting Safety
for All Riders in Texas**



*For more information, contact
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SAFER BY DESIGN: New TTI Tool Prioritizes Roadway Safety from the Get-Go



“The concept is simple: the higher the design option score, the safer the roadway will be. How effective each countermeasure is at enhancing safety is backed up by a mountain of data gathered over decades of crash analysis.”

*Robert Wunderlich
TTI Senior Research Engineer and
Director of the Institute’s Center for
Transportation Safety*

MEASURE TWICE, CUT ONCE — that’s the old carpenter’s adage aimed at improving quality and reducing error. A new tool created by researchers at the Texas A&M Transportation Institute (TTI) can help engineers achieve similar efficiencies when designing roadways while saving lives and reducing injuries.

Typically, roadway designs are largely dictated by engineering decisions driven by established standards. For example, what slope angle should the curve include, or where should the signage be placed to alert drivers the curve is ahead? Once the road is constructed, safety data can help engineers better understand how past engineering decisions and driver behavior sometimes resulted in crashes. Adjustments can then be made to improve safety. But what if roadway safety could be maximized *before* those crashes occur?

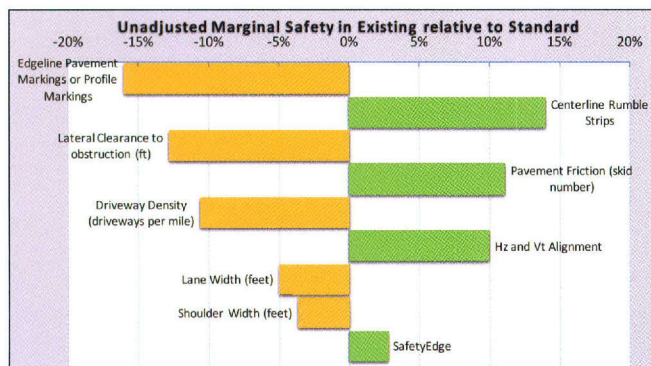
TTI created the Safety Assessment Methodology and Tool to help designers understand how interventions can affect the safety of roadway design before construction even occurs. Each countermeasure's safety effectiveness is scored using crash modification factors (CMFs) for each roadway feature in a new design. According to the Federal Highway Administration, a CMF is used "to compute the expected number of crashes after implementing a countermeasure on a road or intersection." In designing this new tool, TTI researchers used Texas-specific CMFs, when available, or factors developed from safety studies conducted across the country and catalogued at the CMF Clearinghouse. The project was sponsored by the Texas Department of Transportation (TxDOT) as part of its new initiative to maximize the overall safety of roadways statewide.

"The scoring tool is intended to be used by designers as early as project scoping and through the design process to take a hard look at what can be done to make a project safer," explains Jessica Butler, deputy director of TxDOT's Design Division. "Availability and use of the tool can help drive dialogue and support design decisions that enhance the safety of the roadway."

Generally speaking, traditional design looks at existing conditions (geography, weather, etc.) where a roadway is proposed and then applies accepted design standards to construct it. The methodology behind the tool works within that framework while providing safety-enhancement options for designers to consider. The tool enables designers to explore two options scored on a scale of 1 to 100 based on their expected safety performance. The tool also compares those scores to one another, the standard design for the proposed roadway, and a conceptual optimal design for that facility.

"Prioritizing safety in the design process can prevent and mitigate crashes from day one, compared to simply designing to meet today's standards, assessing safety problems after the fact, and then applying safety countermeasures," explains TTI Associate Research Engineer and Roadway Safety Program Manager Raul Avelar, who led TTI's development team.

Three input categories — geometric (40 points), roadside (40 points), and traffic (20 points) — add together to reach the potential maximum score of 100 points. Geometric



How the different interventions compare (positively and negatively).

"Prioritizing safety in the design process can prevent and mitigate crashes from day one, compared to simply designing to meet today's standards, assessing safety problems after the fact, and then applying safety countermeasures."

Raul Avelar
TTI Associate Research Engineer and
Roadway Safety Program Manager

and roadside elements are weighted more heavily than traffic elements because they're likely to remain in place the longest (e.g., the shoulder width usually isn't changed once constructed). Less permanent traffic devices, however — like signs and markings — can more readily be replaced as design standards evolve.

"The concept is simple: the higher the design option score, the safer the roadway will be," says TTI Senior Research Engineer Robert Wunderlich, director of the Institute's Center for Transportation Safety. Wunderlich and TTI Senior Research Engineer Karen Dixon, head of TTI's Traffic Operations and Roadway Safety Division, were key contributors on the project. "How effective each countermeasure is at enhancing safety is backed up by a mountain of data gathered over decades of crash analysis."

Anyone who can use Microsoft® Excel® can use the tool, which is an editable spreadsheet. The user chooses the existing conditions and required design standards for the planned roadway and then selects combinations of elements (e.g., rumble strips, signage and wider shoulders) to determine how implementing those countermeasures can affect the roadway's overall safety score. Not only will the tool compare the basic design to the two optional and optimal designs, but it will even show whether the safety options selected will help or hinder overall safety. The user can then tweak options to improve the design score and optimize safety.

"Our intention is to offer designers a simple, straightforward decision aid to identify the benefits of different safety components," says Avelar. "We're not trying to override engineering judgment or suggest CMFs or safety should be the only driving criterion in the design process."

Presented to multiple TxDOT districts around the state, the tool has garnered accolades for the way it empowers designers to advocate for safety in a language they can understand: engineering innovations applied under specific circumstances. ■



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A GALAXY NOT SO FAR AWAY: SAFETY INNOVATION AT THE 2020 VIRTUAL TRAFFIC SAFETY CONFERENCE



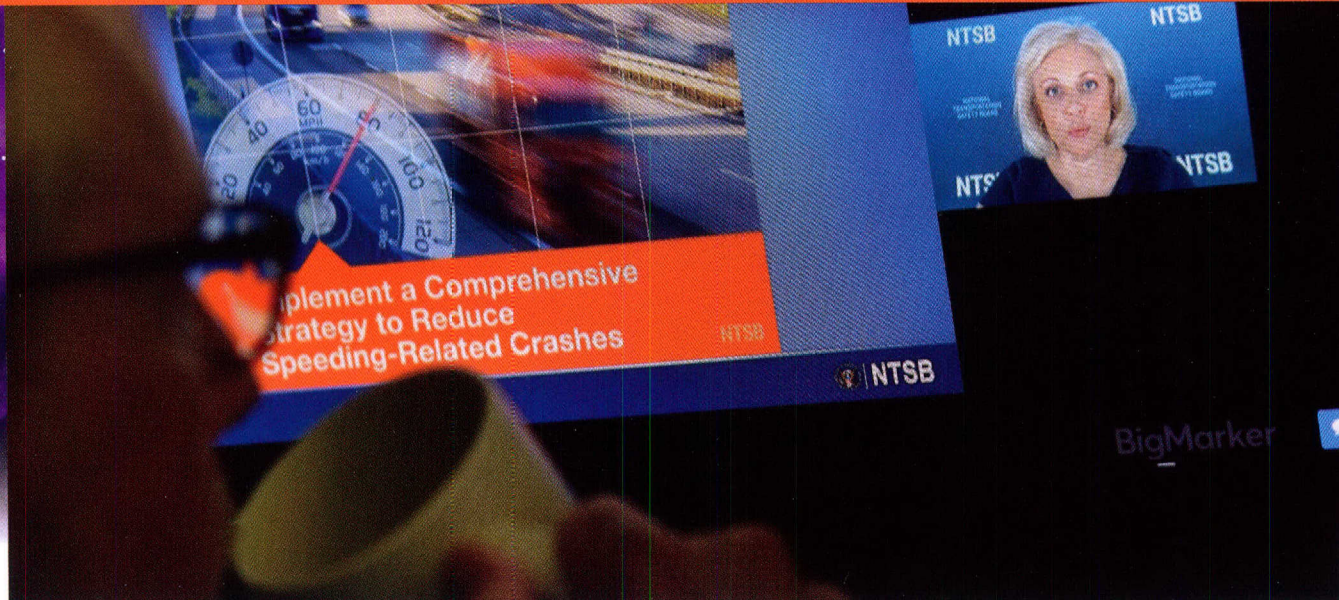
Texas Transportation Commissioner Laura Ryan speaks to attendees of the 2020 Virtual Traffic Safety Conference, emphasizing the lives we can save by committing to end the streak of daily fatalities on Texas roads. TxDOT's #EndTheStreakTX campaign seeks to achieve zero traffic deaths in Texas by 2050.

“We really appreciate everyone coming together, at least virtually, to learn about traffic safety. This is our first rodeo [online], so please pack a little patience. This is the largest group we’ve ever had for a Traffic Safety Conference.”

*Robert Wunderlich
Director of TTI’s Center for
Transportation Safety*

The Texas A&M Transportation Institute (TTI) hosted the first-ever virtual Traffic Safety Conference June 10–12, 2020. The conference, supported by the Texas Department of Transportation (TxDOT), focused on traffic safety issues and forward-looking research aligned with TxDOT’s goal to end all traffic fatalities on Texas roadways by 2050. For more information on the zero deaths goal, read TxDOT’s press release: <https://www.txdot.gov/inside-txdot/media-center/statewide-news/012-2019.html>. Even with the conference moving online, more than 550 attendees viewed and participated in sessions.

“We really appreciate everyone coming together, at least virtually, to learn about traffic safety. This is our first rodeo [online], so please pack a little patience,” urged Robert Wunderlich, director of TTI’s Center for Transportation Safety, as he opened the conference. “This is the largest group we’ve ever had for a Traffic Safety Conference.”



National Transportation Safety Board Member Jennifer Homendy stressed the issue of speeding in her keynote address, which opened the conference on June 11.

Other sessions over the three-day conference supported the goal to reduce traffic fatalities with topics such as telemedicine technology, improved data collection and analysis methods, and tailored law enforcement training.

National Transportation Safety Board Member Jennifer Homendy stressed the issue of speeding in her keynote address on June 11. “Roadways aren’t race tracks. ... Speeding was a problem before the pandemic, and it’s something that needs to be addressed. I drive I-95 every day on the way to work, when not at home during the pandemic, and everyone is speeding around me.”

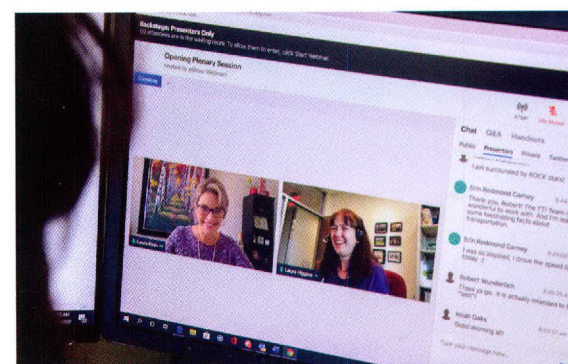
Wunderlich zoomed out to a systemic view of safety in two breakout sessions on the Safe System approach. He stressed, “We should be stewards of a safer environment. We also need to integrate the needs of all users, anybody using the system. The stewards of the system have a responsibility to recognize that users make mistakes and bad decisions. ... What we want to do is to reduce the opportunity for those mistakes to happen in the first place and to mitigate the consequences.”

Other sessions over the three-day conference supported the goal to reduce traffic fatalities with topics such as telemedicine technology, improved

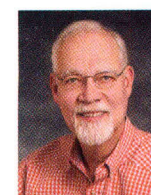
data collection and analysis methods, and tailored law enforcement training. TTI Center for Alcohol and Drug Education Studies Director Troy Walden presented on impaired-driving technology, including the Driver Alcohol Detection System for Safety. As Walden explained, “The main goal of this technology is to separate the driver from making the poor choice to drive impaired.”

Texas Transportation Commissioner Laura Ryan’s June 12 keynote address focused on meeting TxDOT’s zero deaths goal: “With all that has changed over the past few months, one thing is constant, and that’s keeping Texans safe on our roadways.” Ryan encouraged conference attendees to increase awareness about preventable traffic-related deaths on Texas roadways. She said, in closing, “I have a picture in my office of a saying, ‘One day or day one, you decide.’ I hope you will choose ‘day one.’”

Anecdotal accounts suggest the 2020 Traffic Safety Conference — now in its 11th year — was a resounding success. A strong social media campaign



advertising the event ahead of time, along with conveniences like online attendance (requiring no travel or the associated expenses) and access to webinars after the fact, helped recruit nearly twice last year’s number of participants. Surveys are now out to attendees to determine their satisfaction with the conference and to identify improvements for next year. ■



For more information, contact **Robert Wunderlich** at (979) 317-2504 or r-wunderlich@tti.tamu.edu.

TTI Experts Help TxDOT Enhance Roadside Safety

Groundbreaking Motorcycle Net Containment System for Concrete Barriers

For decades, concrete barriers have proven successful in helping vehicles stay on the roadway during a crash. Sometimes motorcyclists also crash into these barriers and are often injured or killed if thrown over the top. Researchers from the Texas A&M Transportation Institute's (TTI's) Roadside Safety and Physical Security Division designed and tested a semi-rigid containment system to help mitigate this phenomenon as part of a project sponsored by the Texas Department of Transportation (TxDOT). Made from a chain-link fence attached to the barriers, this net is intended to catch the motorcyclist and reduce the number of injuries and fatalities when crashes occur.

"What is really unique about this project is that currently no national standard exists for motorcyclists with regard to bridge rails or other crash-tested devices," says TxDOT Bridge Standards Engineer Taya Retterer, who worked with the TTI team. "So this Texas motorcycle barrier system standard will be the first of its kind in the state."

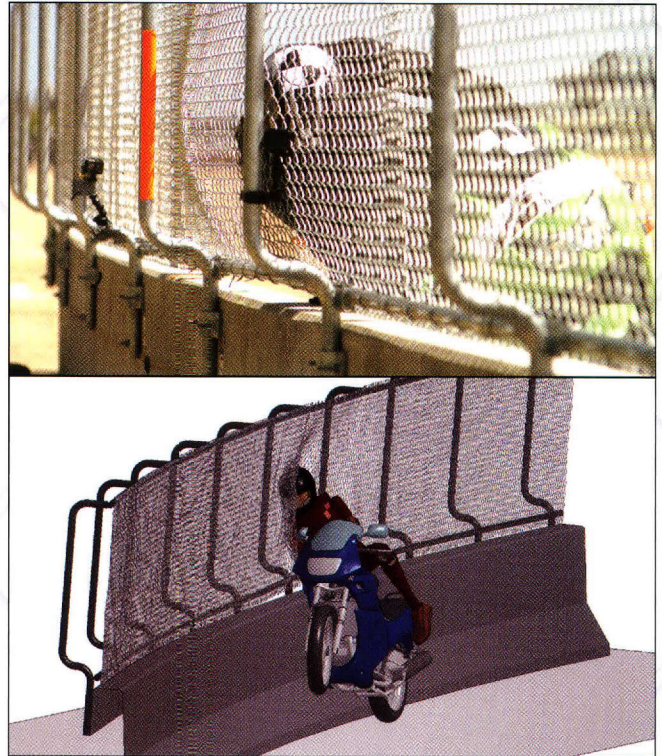
In the design phase, TTI researchers knew they were facing a three-part challenge. They had to:

1. create a semi-flexible system that would easily attach to existing or new rigid concrete barriers,
2. find a post type and placement that could only protrude a certain amount on the other side of the barrier, and
3. minimize the interaction of the errant motorcyclist with the barrier fence posts upon impact.

"With the crash simulation software, we are able to conduct many virtual crash tests to optimize the design for the best placement and configuration of the posts, as well as to locate

"What is really unique about this project is that currently no national standard exists for motorcyclists with regard to bridge rails or other crash-tested devices. So this Texas motorcycle barrier system standard will be the first of its kind in the state."

*Taya Retterer
TxDOT Bridge Standards Engineer*



Actual (top) and predicted (bottom) trajectory and interaction between the motorcycle rider and the net system during an impact event.

the critical point of impact for the crash-test dummy used in conducting the live crash test," explains TTI Research Scientist Chiara Silvestri Dobrovolny, the Institute's lead researcher on the project.

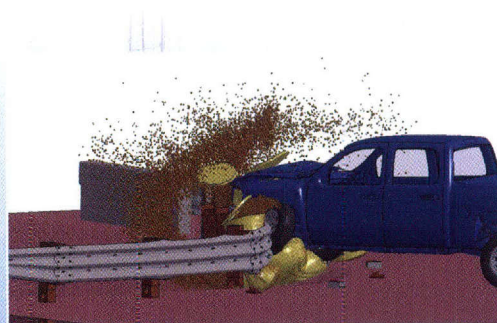
Both simulated and live crash tests were successful in addressing all design and safety criteria. In fact, the simulation prediction was reproduced perfectly in the live test, and TxDOT now has a new Motorcycle Net Standard posted on its Bridge Standards web page for implementation by TxDOT districts.

"TxDOT chose to invest in this system because we are always interested in making our safe system even safer for all types of drivers in the traveling public," says Retterer. ■



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TTI Tests New Standard for Innovative TL-2 Short Radius Guardrail Treatment



A research team from TTI's Roadside Safety and Physical Security Division designed and tested a new short radius guardrail treatment designed for use at intersections on low-speed roadways. Before real-world testing occurs (above), researchers perfect the design using computer model simulations (insets).

Geometric challenges, special conditions and restrictions often make it difficult to accommodate an effective and compliant curved guardrail, particularly at intersections on low-speed roadways. Working with the Texas Department of Transportation (TxDOT), engineering experts in the Texas A&M Transportation Institute's (TTI's) Roadside Safety and Physical Security Division have developed a short radius guardrail system. The new standard meets the American Association of State Highway and Transportation Officials' *Manual for Assessing Safety Hardware* (MASH) Test Level 2 (TL-2) performance criteria for use on low-speed roadways.

"When a secondary road or driveway intersects a highway close to a bridge, it's difficult to fit the proper guardrail length along the primary roadway to effectively protect motorists from crashing into the drop-off and other hazards under the bridge," explains TxDOT Transportation Engineer Christopher Lindsey, who worked with the project team. Roadside safety researchers have been seeking crashworthy solutions for a short radius guardrail treatment for two decades. According to Lindsey, "They have finally succeeded."

TTI researchers first established TxDOT design requirements and site constraints for practical implementation on low-speed roadway intersections, where traffic travels at 44 mph or less. The initial design concepts came from engineering reviews of previous tests, including those previously conducted for the TTI-developed short radius MASH Test Level 3 guardrail treatment for high-speed roadways.

"Then, with repeated computer simulation models, we were able to add

some innovation to the design by using sand drums behind a three-beam rail," says TTI Research Scientist Akram Abu-Odeh, who led the project. "The sand drums absorb a good bit of energy as the vehicle is enveloped by the rail, slowing it down substantially."

TTI conducted five full-scale crash tests in compliance with MASH TL-2 test conditions, modifying some test conditions by increasing the impact angle from 15 to 25 degrees. All tests were successful according to MASH test evaluation criteria. TxDOT now has a new standard for a crashworthy short radius design that can be implemented on low-speed roadways.

"The magic in the system is the sand barrels TTI designed to absorb the amount of energy needed to both shield the bridge rail and keep the car from going into the drop-off," says Lindsey. "No other project has been able to accomplish that until now." ■

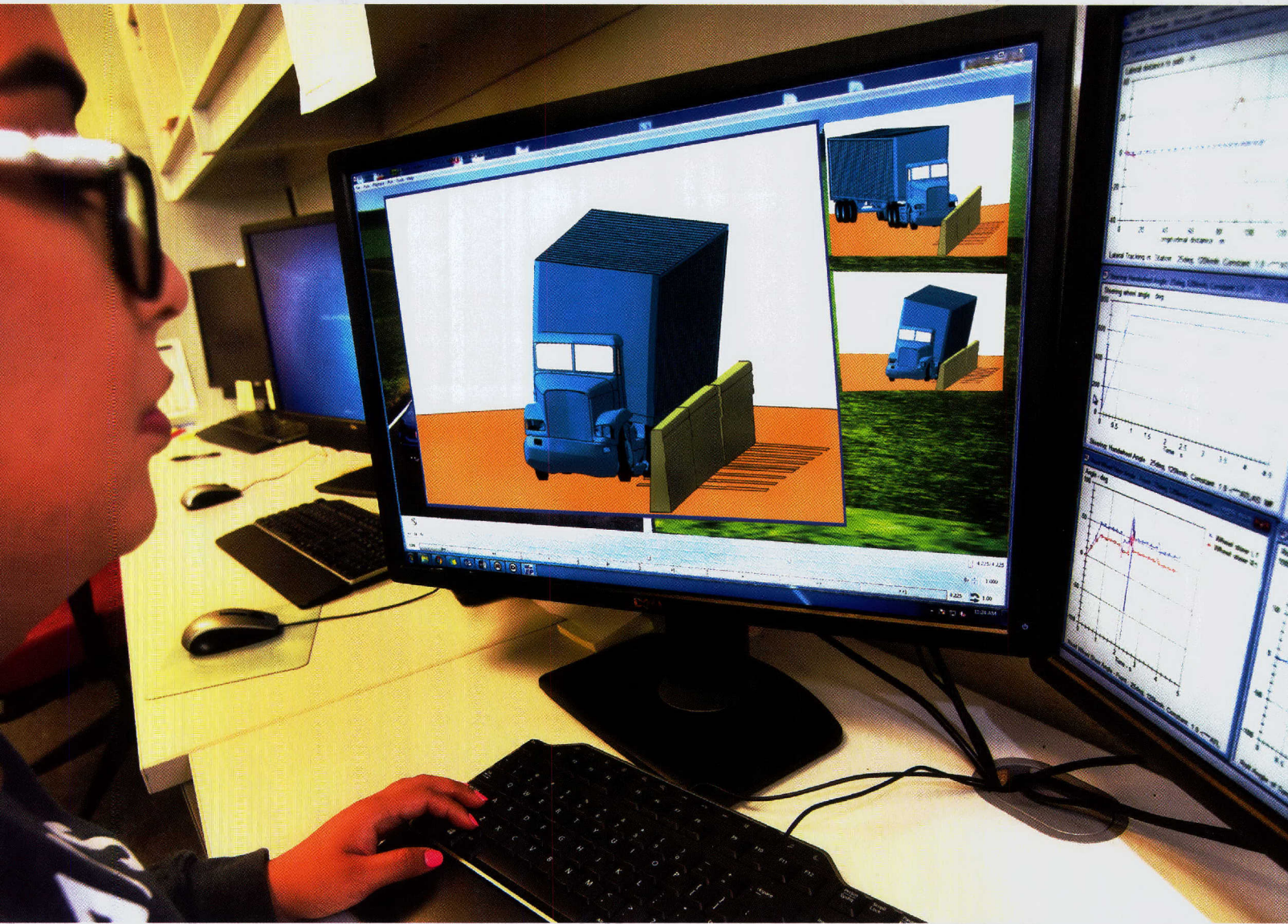
"The magic in the system is the sand barrels TTI designed to absorb the amount of energy needed to both shield the bridge rail and keep the car from going into the drop-off. No other project has been able to accomplish that until now."

*Christopher Lindsey
TxDOT Transportation Engineer*



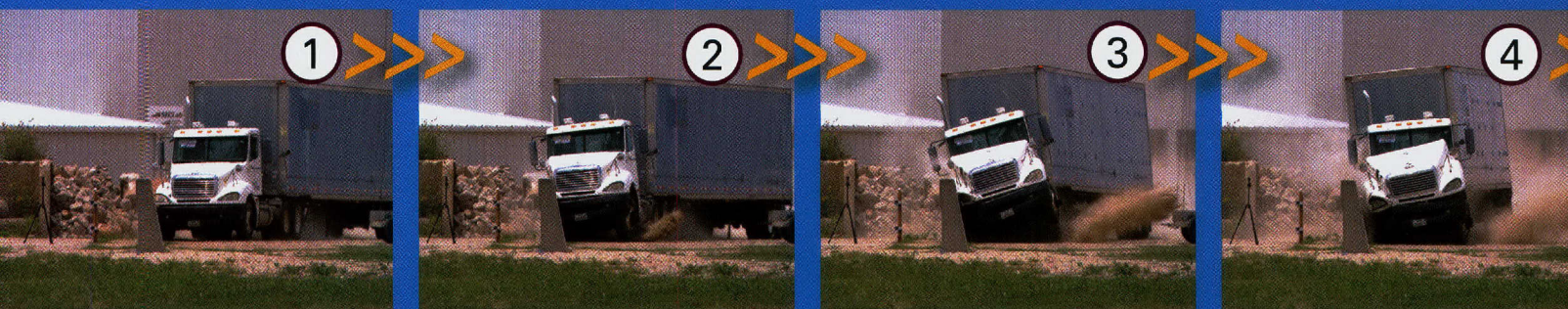
For more information, contact Akram Abu-Odeh at (979) 317-2682 or a-abu-odeh@tti.tamu.edu.

TTI Develops New MASH-Compliant Barrier Design, Foundation System to Shield Older Bridges during 18-Wheeler Crashes



Computer simulation shows an 18-wheeler crash into a newly designed concrete barrier with an independent foundation. TTI researchers conducted simulations of the different crash scenarios before performing the actual full-scale crash test (below).

Sequential photos below show the approach, impact and aftermath of an 80,000-pound tractor-trailer crash into a foundation-supported concrete barrier.



A large, anxious crowd was gathered for a full-scale crash test on a hot July day in 2019. Although a rare event, using 18-wheelers to crash-test guardrails, bridge railings and, in this case, a concrete barrier, is always memorable.

And if the test (conducted at the Texas A&M Transportation Institute [TTI] Proving Grounds on The Texas A&M University System's RELIS Campus) was successful, it would mean that lives could be saved and bridge safety could be improved. The Texas Department of Transportation (TxDOT) was interested in ways to prevent trucks from crashing into bridge columns adjacent to older designed, high-speed roadways. The department sponsored the project, Analysis of 54-Inch Tall Single Slope Concrete Barrier on a Structurally Independent Foundation, with TTI to develop a new barrier.

The project developed the first 54-inch tall barrier with a structurally independent foundation to meet the new *Manual for Assessing Safety Hardware* (MASH) Test Level 5 testing requirements. The 18-wheeler's trailer was loaded with 80,000 pounds and reached a speed of 50 mph before it rammed the barrier at a 15-degree angle. It was a short-lived thrill for the crash test newcomers, but for the TTI researchers and officials from TxDOT, a lot was riding on this moment.

The test was successful, demonstrating that the drilled shaft foundation and the barrier designed by TTI engineers combine to shield bridge columns adjacent to roadways from an 18-wheeler impact. This new design could soon be used across Texas as a test-proven tool in the toolbox.

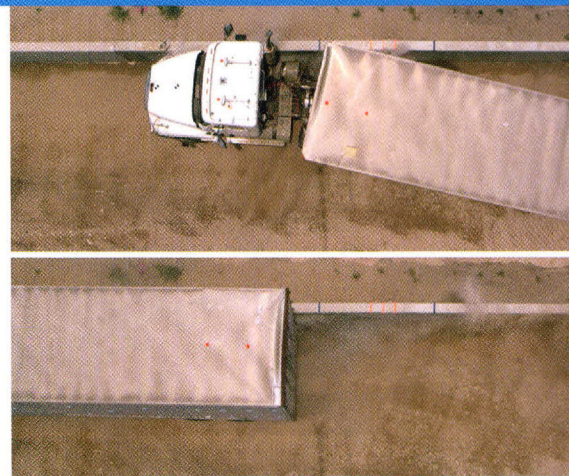
"I was extremely pleased with the results," TxDOT Bridge Standards Engineer Taya Retterer vividly recalls. "Our eyes were focused on the 54-inch-tall concrete barrier hit by the truck. We were very impressed that there was very little movement of the barrier and its foundation. It's what we needed to see to know that the test passed."

"Newly constructed bridges in Texas have columns that are already designed to survive a hit from an 18-wheeler, but that is not the case for some older bridges across the state."

*Nauman Sheikh
TTI Associate Research Engineer*

"Newly constructed bridges in Texas have columns that are already designed to survive a hit from an 18-wheeler, but that is not the case for some older bridges across the state," explains TTI Associate Research Engineer Nauman Sheikh, the Institute's research supervisor on the project.

According to Sheikh, an 18-wheeler hitting the columns of such bridges can be catastrophic, which speaks to the need for a barrier design and foundation system that can withstand such high-powered impacts. Before



An aerial view of the tractor-trailer impacting the foundation-supported concrete barrier.

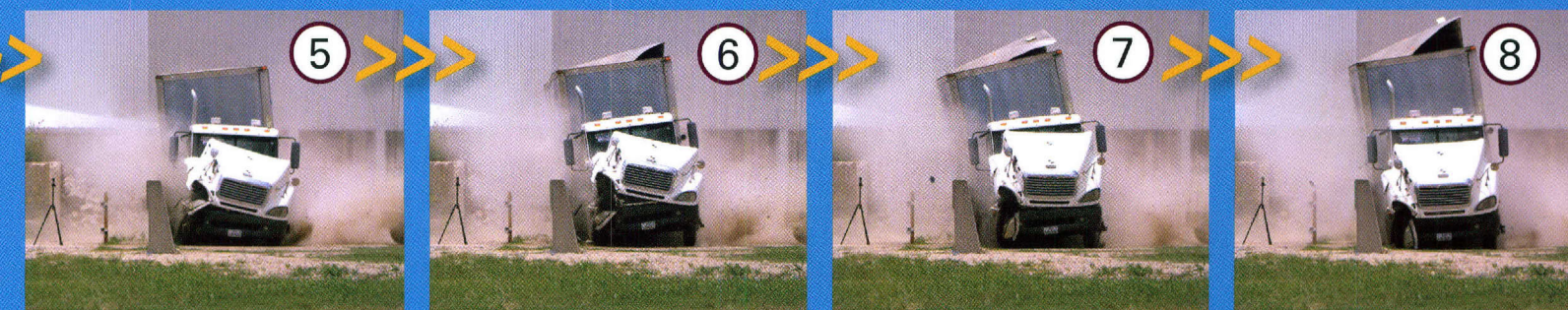
conducting expensive, real-world crash tests, however, Sheikh and his team relied on numerous design combinations, testing them via computer simulation before focusing on the drilled shaft foundation for crash testing. Those computer simulations were critical to determining foundation sizes and the depth of the shafts that would stand up to the high impact force of an 18-wheeler.

"The system kept the truck from penetrating the barrier," Sheikh confirms. "In addition, the vehicle did not go over the installation and was safely directed away from the barrier, without much possibility of impacting any bridge columns behind the barrier." Sheikh points out that when installing the system, the barrier should be 2 feet away from columns to make up for the 18-wheeler's lean angle upon impact.

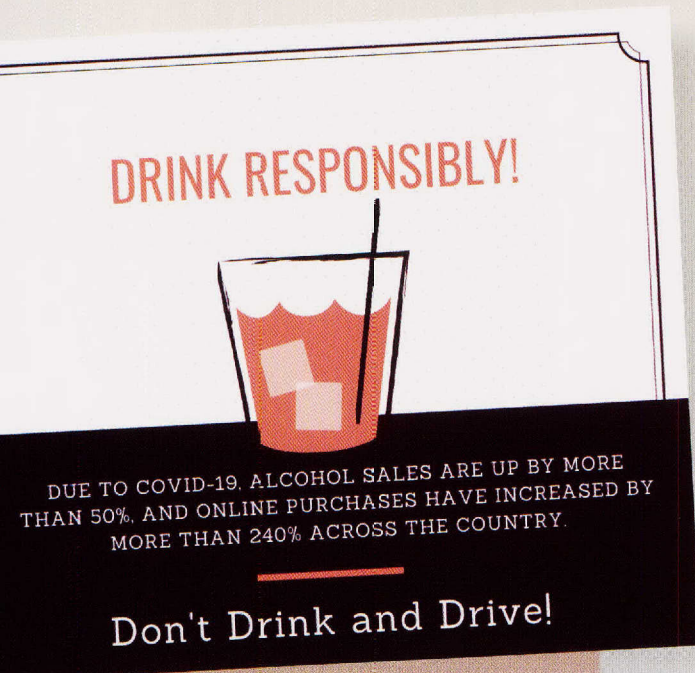
The TxDOT approval process for the new system is under way, and it should be available as an option for use as early as this summer. ■



*For more information, contact **Nauman Sheikh** at (979) 317-2695 or n-sheikh@tti.tamu.edu.*



Texas Impaired Driving Task Force ENCOURAGES VIRTUAL HAPPY HOUR DRINKERS TO STAY HOME



SOCIAL DISTANCING GUIDELINES during the COVID-19 pandemic prompted people to get creative with the ways they socialize with friends and family. With alcohol sales on the rise and more people staying at home, virtual happy hours were born. One option for holding a virtual happy hour: having a meetup from the comfort of your home using videoconferencing software.

But virtual happy hours have one thing in common with traditional ones — participants can become too inebriated to drive. To remind people not to drive impaired, the Texas Impaired Driving Task Force (TxIDTF) started a social media campaign, End Your Virtual Happy Hour Right. The campaign suggested fun things to do at home after a virtual happy hour to deter impaired driving through clear “don’t drink and drive” messaging.

“With a spike in alcohol sales during the pandemic, we understood the need to continue to use TxIDTF social media platforms to provide clear messaging against impaired driving. The campaign encouraged people to stay at home and do a puzzle, organize their closet, or read a book instead of running an errand impaired.”

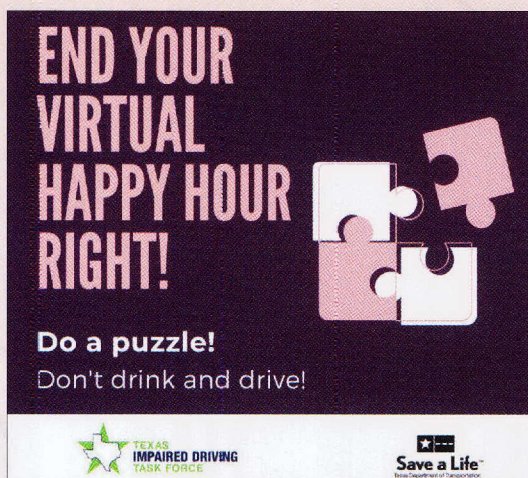
*Troy Walden
TTI Research Scientist and Director
of TTI’s Center for Alcohol and Drug
Education Studies*

Housed at the Texas A&M Transportation Institute (TTI), TxIDTF has the mission to eliminate crashes and injuries caused by impaired driving in Texas. A traffic safety grant funded through the Texas Department of Transportation (TxDOT) makes the task force possible. TxIDTF’s 45 members represent nearly every facet of the impaired-driving spectrum, with stakeholders from education, enforcement, prosecution, transportation research, the highway safety office and the judiciary. Topics like toxicology, breath testing and ignition interlocks are regularly addressed by the task force. TTI Research Scientist Troy Walden, director of TTI’s Center for Alcohol and Drug Education Studies, and Allison Rounsavall, alcohol program manager at TxDOT, serve as TxIDTF co-chairs. TxIDTF also maintains the Texas Impaired Driving Plan, a strategic plan for reducing impaired driving statewide.

“With a spike in alcohol sales during the pandemic, we understood the need to continue to use TxIDTF social media platforms to provide clear messaging against impaired driving,” says Walden. “The campaign encouraged people to stay at home and do a puzzle, organize their closet, or read a book instead of running an errand impaired.”

The social media campaign succeeded in reaching more than 3,000 individuals and received significant engagement from TxIDTF followers.

“Social media is one of the best places to reach people when they are at home under shelter-in-place orders,” says Rounsavall. “This campaign allowed TxIDTF to continue to remind people that driving impaired is not something they should do.” ■



For more information, contact Paige Ericson-Graber at (979) 317-2521 or p-ericson@tti.tamu.edu.

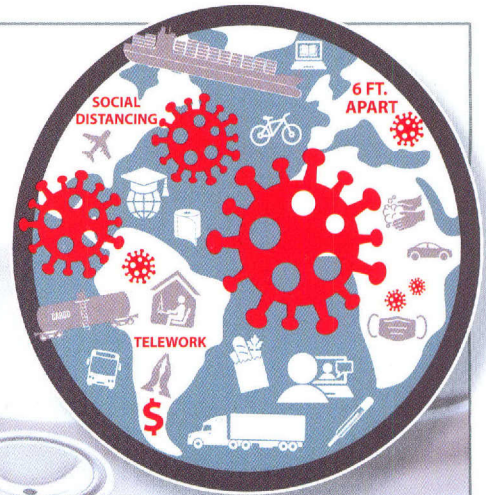
To learn more about TxIDTF and to find it on social media, visit its website at www.texasimpaireddrivingtaskforce.org.

TTI Experts Address the COVID-19 Pandemic

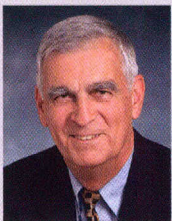
CCOVID-19 is changing everything we know. That includes transportation. Our most severe public health crisis in a century is drastically reshaping how we work, learn, worship and recreate. It's also transforming how we — and the products we need every day — are moved safely and efficiently from one place to another.

In the midst of our national emergency, transportation can assume conflicting roles, paradoxically facilitating the spread of disease while at the same time supporting our ability to fight and recover from it. This underscores our need to contemplate mobility needs in a way that bolsters public health considerations.

TTI researchers are leading these important discussions on topics ranging from telework to freight supply chains to public transit. Their thoughts are collected on a web page, <https://tti.tamu.edu/covid-19/>, which is updated frequently. Visit the page to learn what TTI experts are saying about the long-term impacts of COVID-19 on our transportation system and, by association, our global culture. ■



Epps Presented with Lifetime Achievement Award, Inducted into AMAP Hall of Fame



Epps

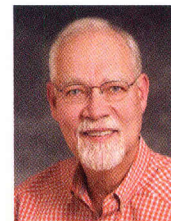
TTI Executive Associate Director Jon Epps accepted the 2020 Lifetime Achievement Award from the Association of Modified Asphalt Producers (AMAP) Feb. 12. The AMAP board of directors also inducted Epps into the AMAP Hall of Fame. AMAP promotes the value of asphalt modifiers and additives, and serves the industry as a clearinghouse of information about existing modifiers and modifier technologies as well as innovations in the field. AMAP gave Epps the AMAP 2020 Lifetime Achievement Award "in recognition of lifelong leadership advancing asphalt paving technologies."

"I'm honored to receive this award from AMAP and be an inductee to the association's Hall of Fame," says Epps. "What's important is giving back to the industry that means so much to me."

With over 50 years in this industry, Epps has authored or co-authored more than 500 research publications in fields such as soils stabilization, recycling, design of flexible pavements, polymer modification, warm-mix asphalt, sustainable pavements, and structural testing. He has also encouraged up-and-coming generations of engineers and asphalt technologists to increase the industry's knowledge base for building sustainable asphalt pavements.

Everett Crews, AMAP president and director of research and development pavement technologies at Ingevity, notes, "We're witnesses to Epps's devotion to professional service in our industry, and he continues to mentor and inspire others to follow in his footsteps." ■

The Safe System Approach with Wunderlich



Wunderlich

Robert Wunderlich, P.E., Institute of Transportation Engineers fellow and director of the TTI Center for Transportation Safety, discusses

the Safe System approach to reducing serious injuries and fatalities on roadways. He highlights the various aspects of the Safe System, including roadway design that reduces user error and lowers impact forces, and explains what transportation professionals can do to help implement a Safe System approach.

Listen at <https://www.speaker.com/user/ite-talks-transportation/robert-wunderlich>. ■

For more information about TTI News, contact **Rick Davenport** at (979) 317-2408 or r-davenport@tti.tamu.

Kuhn Elected ITE International Vice President, Named A&M System Regents Fellow



TTI Senior Research Engineer Beverly Kuhn was elected the 2021 international vice president of the Institute of Transportation Engineers (ITE). Kuhn, head of TTI's System Reliability Division, will take office in January 2021.

Kuhn's expertise covers a number of transportation fields, including advanced transportation operations, connected infrastructure, active transportation and demand management. She's led cutting-edge research projects for the U.S. Department of Transportation and various state departments of transportation around the country, among other sponsors. The work has led to roadways that are better designed, less congested and safer to travel.

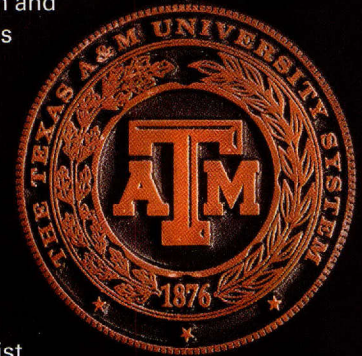
Since joining ITE as a student 35 years ago, Kuhn has been active at every level and is currently an ITE Fellow. As international vice president, Kuhn will work with the International Board of Direction and the membership to further embrace diversity, enhance collaboration among transportation stakeholders, and fully leverage the expertise and perspective of ITE's councils and committees. Her vision is to enhance the integral role transportation plays in the prosperity of our communities and citizens.

"I believe ITE can help ensure our members and our neighbors are not only included but heard in a meaningful dialogue so that their needs are met, and they can realize the future they want for themselves and their families," says Kuhn. "As transportation professionals, we play a key role in helping make their success a reality."

Kuhn has also been named a Regent's Fellow by The Texas A&M University System Board of Regents and will be honored with the Regents Fellow Award during a ceremony scheduled for this summer.

In addition to her vast experience helping solve transportation problems through research, Kuhn has shared her knowledge with students by teaching courses in transportation and civil engineering. Besides volunteering her time and expertise for transportation-affiliated associations, Kuhn has shown her devotion to humanitarian causes with her service to numerous Texas A&M and College Station, TX, organizations — a long list that includes the Texas A&M University Council of Principal Investigators and Boy Scout Troop 102.

"I am honored to receive the Regents Fellow Service Award," Kuhn said of the prestigious recognition. "I chose a research career in transportation in an attempt to help make our transportation system better and improve the lives of our neighbors. I am humbled to be recognized by the A&M System for my efforts to serve my community and the state of Texas, and to make the world a better place." ■



Lomax Receives TSPE 2019 Engineer of the Year Award

TTI Research Fellow Tim Lomax received the Texas Society of Professional Engineers (TSPE) Brazos Chapter 2019 Engineer of the Year Award Feb. 18. Founded in 1936, TSPE, a part of the National Society of Professional Engineers, encourages and supports engineers across Texas in 24 local chapters and 8 student chapters.

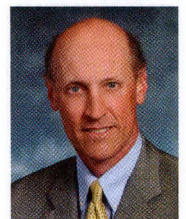
Lomax received the award for his efforts scoping and implementing the Kyle Field Football Game Transportation Plan and assisting local agencies in communicating the status of several large, ongoing local transportation projects. He's the 10th TTI engineer to receive the award.

"I've been lucky to work with many great professionals across a range of disciplines at our excellent local partner

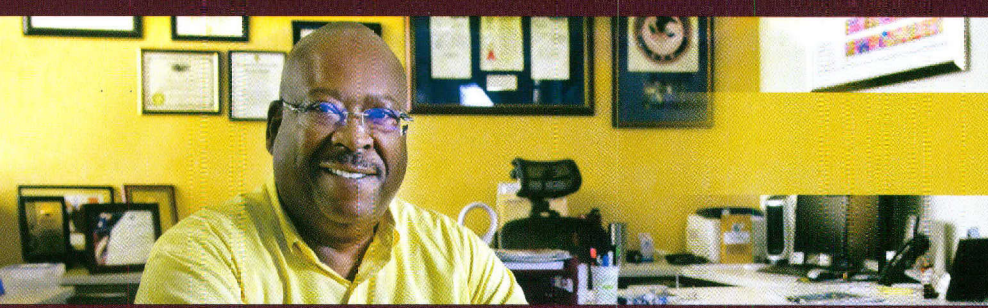
agencies," says Lomax. "My TTI research colleagues have been very supportive in these efforts — particularly David Schrank, Bill Eisele and Shawn Turner."

Lomax's career in urban mobility research spans more than 35 years. He is perhaps best known for his leadership in producing TTI's *Urban Mobility Report* and contributes to regional and statewide congestion analyses and often helps to generate solution strategies.

"The Brazos Chapter of TSPE is excited to present this award to such a deserving member of our local engineering community," says Susan Monnat, vice president of TSPE's Region II. ■

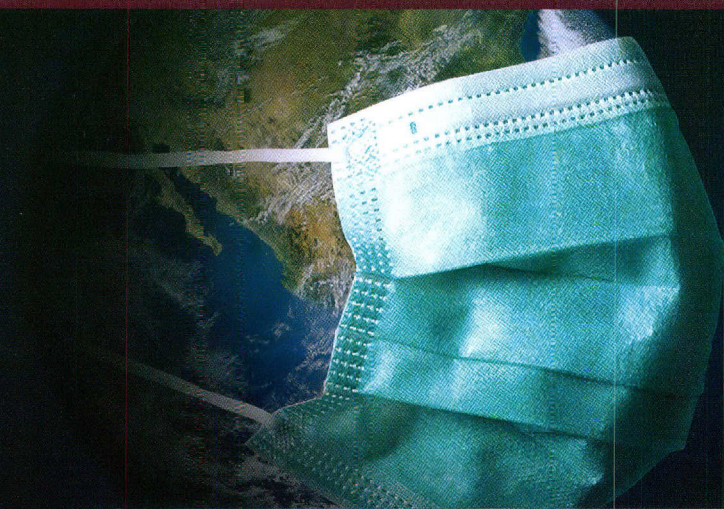


Lomax



More than Meets the Eye —

Expanding How We See Transportation Safety in a World with Pandemics



Historically, transportation research has focused on avoiding dangers we can see. The first traffic light troubleshooted human errors in judgment by better regulating traffic flow. As the 20th century unfolded, our focus shifted to innovations like seat belts and air bags to help us survive crashes we couldn't avoid. Nowadays, sensors and cameras — high-tech “eyes” in connected-automated vehicles — guide self-driving cars around roadway hazards.

We've survived viral threats before, but the COVID-19 pandemic will have long-lasting impacts felt on a global scale. Texas A&M Transportation Institute (TTI) experts have published numerous articles in recent months identifying some of these: from teleworking becoming the new normal (and the impact on congestion and mobility) to the effects of pandemic protocols on public transportation and the economic supply chain. (Access these insights at <https://tti.tamu.edu/covid-19/>.)

In the wake of COVID-19, we must zoom in our view of safety to include dangers we can't see: microbial threats even more deadly in the scale of their effect than roadway hazards. As we evolve

our research agenda, our ingenuity and innovation must address the harder-to-see hazards on our steering wheels, bus handrails and airline seats. We must redefine the concept of individual safety beyond safety belts and air-bags to include personal hygiene and its impact on our shared transportation environment.

The concept of *shared mobility* has new resonance in the wake of COVID-19: public transit, rental cars and airline flights are just a few travel spaces we share. In fact, the Transportation Research Board forum I co-chair is currently evaluating research topics that examine transportation *exclusively* within the context of mitigating the spread of deadly diseases. TTI,

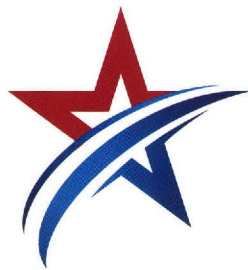
too, is reexamining how we can adapt our research approach to promote public safety by focusing on these kinds of threats. And on the front lines of the viral war, New York's Metropolitan Transportation Authority is pilot-testing the use of ultraviolet light to kill viruses in public spaces like hospital operating rooms and subways.

Such innovative approaches to safety represent an expansion of how we define public health within the context of transportation. We should absolutely continue more traditional research efforts in developing crash-avoidance technologies and conducting behavioral research aimed at preventing crashes. But we should also focus on discovering and developing new ways to apply technology to protect public health from contagious diseases like COVID-19. We can start by looking at — and *seeing* — the concept of transportation safety a little differently ■

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