

Innovative Technologies and Services: TTI Helps Texas A&M Create Greener, More Pedestrian- and Bicycle-Friendly Campus

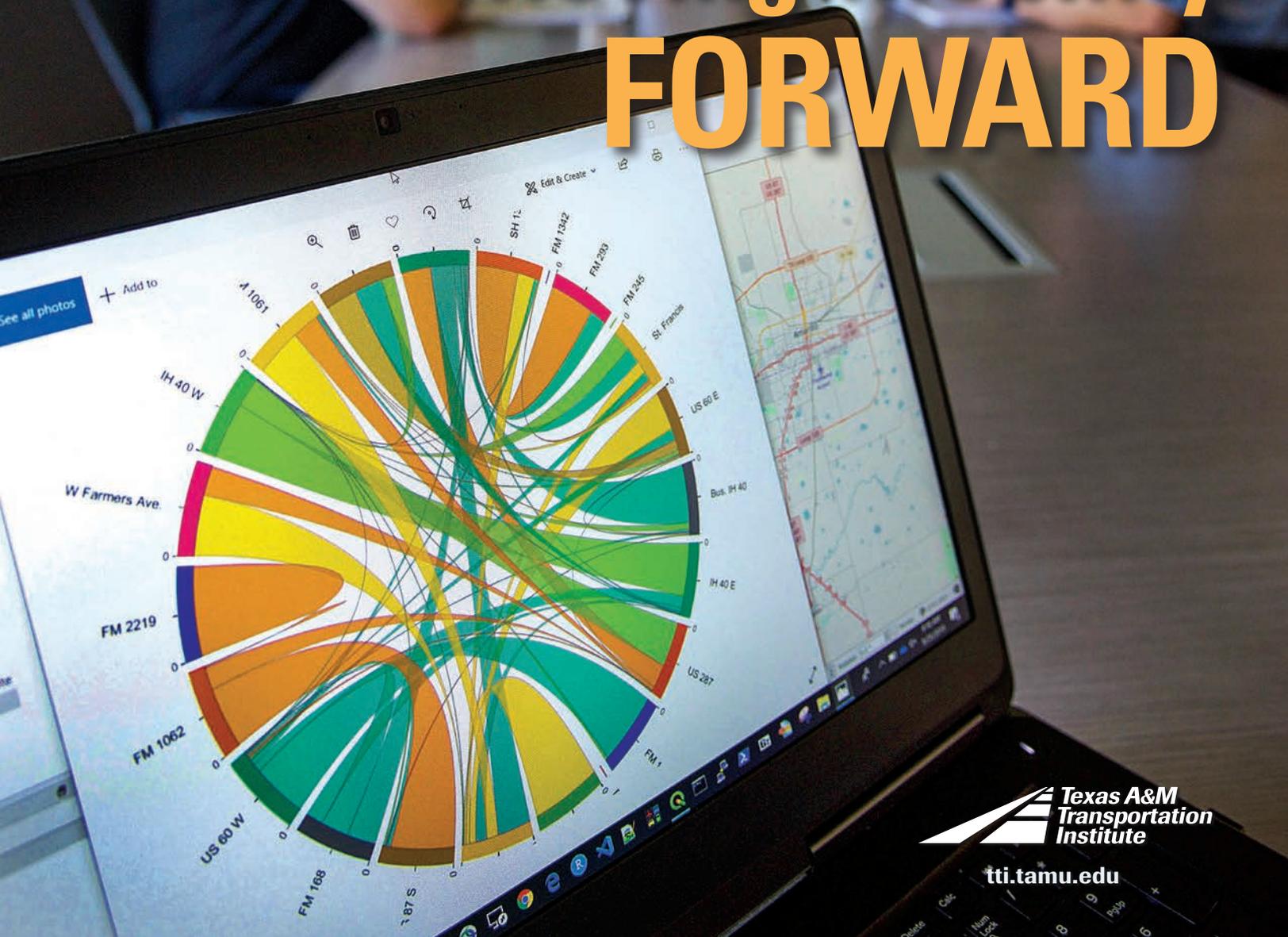
Bicycle and Pedestrian Mobility in Austin: TTI Research Examines the Causes of Collisions

Good News, Bad News: *Urban Mobility Report* Underscores Economy-Traffic Connection

TEXAS TRANSPORTATION Researcher

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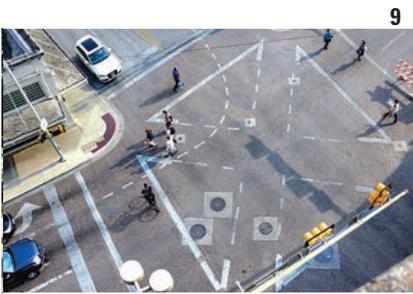
Moving Mobility FORWARD



TEXAS TRANSPORTATION Researcher

VOL. 55 | NO. 3 | 2019

ON THE COVER: Researchers in TTI's Transportation Planning Program use interactive data visualizations like the one on the cover to illustrate external travel originating from, traveling through, and ending in travel-demand model areas. Each bar in this illustration represents the travel percentage between external stations located on major roadways in the Amarillo, Texas, area.



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New Study Underscores Economy-Traffic Jam Link

AT A GLANCE

See related story on page 12.

URBAN
MOBILITY REPORT
2019

Congestion is costly as well as annoying

No matter where you live, congestion is expensive



\$166,000,000,000

COST OF TIME & FUEL LOST TO TRAFFIC CONGESTION, 2017.

\$1,010
average
annual
cost of
congestion
(per commuter)

3.3
BILLION
gallons of fuel
WASTED
on congestion

\$166
BILLION
COST OF TIME
& FUEL LOST
TO TRAFFIC
CONGESTION



<https://mobility.tamu.edu/umr>

Source: 2019 Urban Mobility Report, Texas A&M Transportation Institute



Innovative Technologies and Services

TTI Helps Texas A&M Create Greener, More Pedestrian- and Bicycle-Friendly Campus

Spanning more than 5,200 acres, Texas A&M University’s College Station campus is one of the largest public institutions of higher learning in the world. The recently completed 2017 Campus Master Plan provides the framework for future development of the campus with one of its focus elements being mobility and safety. The Texas A&M Transportation Institute (TTI) is exploring ways to make the flagship campus more walkable and bicycle friendly.

“The Campus Transformational Mobility Plan being conducted by TTI focuses on enhancing pedestrian, bicycle, transit and car-sharing options through the use of innovative technologies, services and approaches,” notes Texas A&M University Architect Lilia Gonzales. “The process involves on-campus groups, as well as local stakeholders

including the Cities of Bryan and College Station, Brazos County, the BCS [Bryan/College Station] Metropolitan Planning Organization, the Texas Department of Transportation, and other public and private organizations.”

A companion project, the Campus Transportation Technology Initiative, provides companies opportunities to pilot new technologies, products and services on campus. “Both projects are fostering a more connected, walkable, bikeable and greener campus through innovative technologies and multimodal services,” says Peter Lange, associate vice president of Texas A&M University Transportation Services. “These projects are also leveraging faculty expertise and enriching student educational opportunities to work on cutting-edge research projects and experience new technology in their daily lives.”

TEXAS A&M BY THE NUMBERS


+28%
Enrollment
Increase
(2011–2018)


5,200
Acres


65,000
Students
Annually


24,000
Faculty and
Staff


120,000
Fans During
Football
Games


37,000
Parking
Spaces


70
Buses Run
Daily


7.5
Million
Riders per
Year

The lessons learned at Texas A&M can help communities large and small — whether they host a college or not — improve mobility and accessibility to services while also promoting safety and security. Some of the initiatives revolutionizing Aggieland transportation are highlighted here.

1. **Self-driving shuttle.** TTI and Texas A&M are currently testing a NAVYA self-driving shuttle operating on campus streets that include pedestrian and bicycling traffic. Researchers are assessing operational feasibility and gaining feedback from students, faculty and staff.
2. **Electric buses.** The Brazos Transit District and Texas A&M Transportation Services recently received a \$14 million BUILD grant from the U.S. Department of Transportation with TTI's help. The grant funds replacement of more than 30 buses with cleaner-burning, diesel alternatives. The grant also funds three battery-electric buses, which will be used on different on- and off-campus routes.
3. **Dockless bikeshare.** Texas A&M is partnering with VeoRide to offer students a pay-as-you-go bike rental option aimed at encouraging active travel across campus. TTI is analyzing the generated trip data and has developed a web-based dashboard that provides origin-destination and route information to help optimize bike routes.
4. **Intersection optimization.** TTI is helping the university and the local communities analyze data gleaned from intersections in and around campus. Iteris® traffic signals count vehicles, bicycles and pedestrians as they move through the intersections. Using those data, traffic planners can determine usage and estimate trends to optimize intersection throughput today and plan safer, sustainable mobility solutions for tomorrow.
5. **Solar energy pavement surface lighting.** In 2016, TTI teamed with Texas A&M Transportation Services to install a first-of-its-kind non-signalized Dutch-style intersection on campus. The broad, bright-green pavement marking stores solar energy and keeps pathways lit at night, promoting safety for cyclists and pedestrians.
6. **Destination Aggieland smartphone app.** TTI led development of the award-winning Destination Aggieland mobile app in 2014. The app, which initially focused on football game days, now helps hundreds of thousands of visitors each year preplan travel routes, find parking, navigate crowded thoroughfares, and experience smoother arrivals and departures while spending less time in bumper-to-bumper traffic.

“The Texas A&M campus provides a living laboratory for faculty, students, researchers, staff and local community members to work together to address key transportation challenges,” says TTI Executive Associate Director Katie Turnbull, who’s leading the Campus Transformational Mobility Plan. “Harnessing the intellectual capacity, creativity and enthusiasm of all groups makes the transportation system better for all of us.” ■



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Bicycle and Pedestrian Mobility in Austin

TTI RESEARCH EXAMINES THE CAUSES OF COLLISIONS



Austin is a modern, thriving city with a population that enjoys an active lifestyle, including the increased use of nonmotorized modes of transportation. Many appreciate the numerous benefits of active transportation, though the growing popularity of nonmotorized modes can also bring increased collisions involving pedestrians, bicyclists and motorists.

“Incidents like these aren’t as common as vehicle-to-vehicle crashes, but when collisions do occur, they’re more likely to end in serious consequences,” says Texas A&M Transportation Institute (TTI) Associate Research Scientist Ipek Nese Sener. “Preventing and reducing crashes involving active travelers are important goals for transportation authorities and agencies, as is mitigating injury severity.”

A recent research project conducted by TTI for the Texas Department of Transportation (TxDOT) Austin District examined pedestrian/bicycle-vehicle collisions in the district for the purpose of developing the Austin District Bicycle and Pedestrian Crash Prediction Tool. As part of this effort, TTI researchers examined fatal, incapacitating and non-incapacitating crashes involving a vehicle and a pedestrian or bicyclist that occurred in the district between 2007 and 2014.

“This study aimed to develop four separate crash models to provide comprehensive insights into the contributing factors related to crash frequency and severity for different active travelers such as pedestrians and bicyclists,” notes Sener. “The models showed the important role of different variables in crash frequency and severity, including travel demand, commute behaviors, network characteristics and sociodemographic features. Using the model results, we identified areas of concern with the greatest potential for safety improvements.”



As might be expected, the core downtown Austin area was the location of most pedestrian/bicycle-vehicle collisions. When it comes to severity, the central business district of Austin ranked high in terms of observed severe bicycle and pedestrian crashes.

The model results indicate that the greatest potential for safety improvement lies in central Austin. In this area, Sener says, reducing crash frequency is more of an urgent focus than alleviating crash severity. For severity, there's not one specific area of major concern. The efforts to mitigate crash severity are needed across the region.

"The study was useful in showing common contributing factors to severe pedestrian and bicycle crashes," notes James Bailey, highway safety projects and railroad engineer for the TxDOT Austin District. "It's led to TxDOT implementing district-wide safety improvements such as high-visibility crosswalks and traffic signal improvements."

While many variables (e.g., traffic volume, walking mode share, percentage of principal arterial roads, and bus stop density) correlated with an increased (or decreased) probability of a pedestrian crash or bike crash, other variables played different roles in explaining pedestrian versus bike crash mechanisms. For example, factors like the percentage of minor arterial roads, network density, and sidewalk length increased the probability of pedestrian crash occurrences only. On the other hand, factors like the percentage of large urbanized traffic and number of intersections were positive indicators for increased bike crashes.

These variations might stem from inherent differences in travel patterns between walking and bicycling. The varying influential factors emphasize the need to differentiate approaches to deal with safety issues between the two nonmotorized modes.

"The study results can help develop safety improvement interventions for vulnerable road users in the Austin District and exemplify how other transportation agencies can estimate pedestrian and bicycle crashes using their existing database and crowdsourced data," says Sener. ■

Examples of Factors That Contribute to Bicycle-Vehicle Crashes



"The study was useful in showing common contributing factors to severe pedestrian and bicycle crashes. It's led to TxDOT implementing district-wide safety improvements such as high-visibility crosswalks and traffic signal improvements."

*James Bailey, Highway Safety Projects and Railroad Engineer,
TxDOT Austin District*



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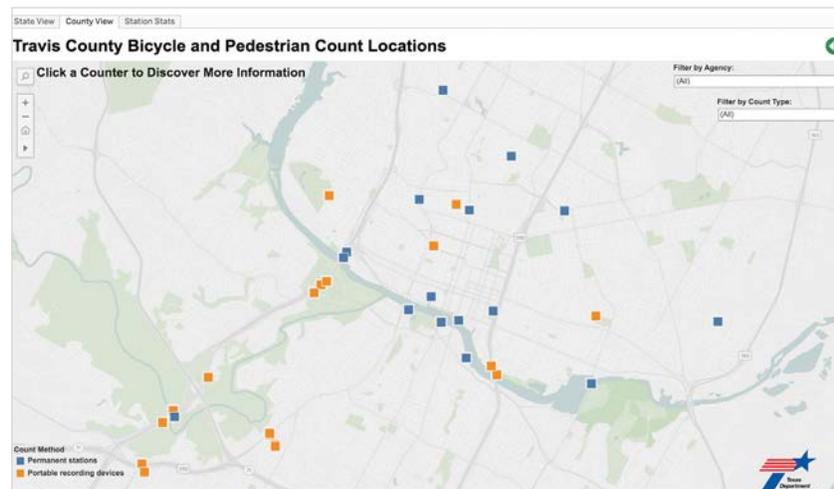
View a *Journal of Transportation Safety and Security* article on the study authored by Sener et al. at <https://www.tandfonline.com/doi/abs/10.1080/19439962.2019.1645778>.

Coordinating Bicycle, Pedestrian Count Data to Identify

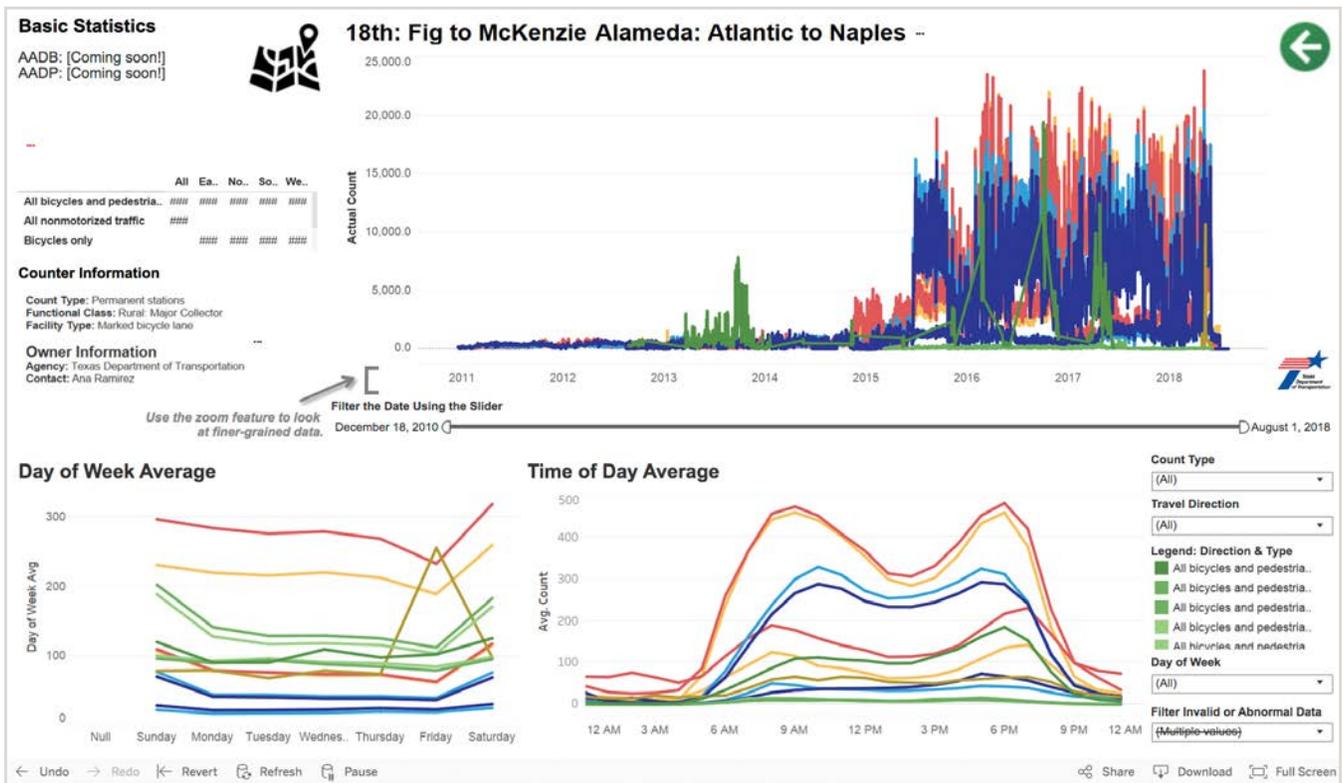
Active Lifestyle Patterns

Ever looked at mobility from big picture to small details? Imagine a map of Texas. Select a county. Zoom in to a metropolitan view, checkered with count locations for bicyclists and pedestrians. Clicking on a count location also brings up a screen of charts that display bicycle and pedestrian count data at various time intervals.

Each Texas city often manages its own bicycle and pedestrian monitoring. But coordinating data could help save money and effort spent by public agencies at different levels. The Texas Department of Transportation (TxDOT) asked the Texas A&M Transportation Institute (TTI) to evaluate count equipment and develop a visualization tool to coordinate bicycle and pedestrian count data across the state. The goal is to empower cities and local entities to contribute data to the tool and then use it in future planning.



“Better data can help TxDOT demonstrate active transportation in different districts,” explains TTI Assistant Research Scientist Phil Lasley. *Active transportation* refers to travel modes that emphasize an active lifestyle — like bicycling or walking — as opposed to driving a vehicle. “The research explored the potential for a collaborative space for local agencies to feed information into a larger system that TxDOT can then leverage to support infrastructure growth. At the local level, each agency is uniquely positioned to identify gaps in its network of counters.”



Because of its limited count data on bicycle and pedestrian patterns, TxDOT would benefit from crowdsourced data providing insights into local patterns. To this end, researchers consulted with TxDOT staff, metropolitan planning organizations, and the Cities of Austin and Houston. Researchers evaluated and installed count equipment in those cities, built a model using crowdsourced data, and created standard categories for how to present those data.

The research team set up a database of bicycle and pedestrian count locations, organized by TxDOT districts and Texas counties, and developed a map-based interface to provide an easy, visual way to sort through the data. The project is ongoing, with more updates planned for the tool, some of which include adding a statistics section and helping agencies to submit, edit

and update data. One of the unique aspects of assembling the database was involving local agencies — that are already collecting data — as editors and curators of the information stored.

“Few agencies have similar systems, especially not with editing capabilities built into the system,” notes Lasley. “Agencies will be able to check, flag and factor counts in their local areas. They may know about events in the area that others may not think about. For example, the Austin City Limits music festival is one event that usually brings in a lot of people who are walking or riding bicycles. There might be a larger spike in count data during those weekends.”

Local agencies are on ground zero, from a data perspective. They know the people that live in their city, and they

keep track of the trails and parks where people frequently walk and ride bicycles. Because of that, local agencies provide more accurate bicycle and pedestrian count data to TxDOT to use in planning. In turn, TxDOT encourages them to embed the map, developed by TTI, into their websites and share data with colleagues and the public.

“TTI provided the technical expertise that TxDOT needed to centralize count data,” says Bonnie Sherman, TxDOT bicycle and pedestrian program manager. “The map allows users to filter by TxDOT district or state county to see where counts are being collected and see patterns in the city’s active lifestyle. Consolidating count data in a user-friendly platform makes it easier to coordinate efforts across different agencies that are collecting data — this is a partnership, after all.” ■



Try out the tool at mobility.tamu.edu/bikepeddata/.



For more information, contact Phil Lasley at (512) 407-1113 or p-lasley@tti.tamu.edu



Urban Mobility Pooled Fund Study Surpasses Two Decades of Service to Sponsors Nationwide

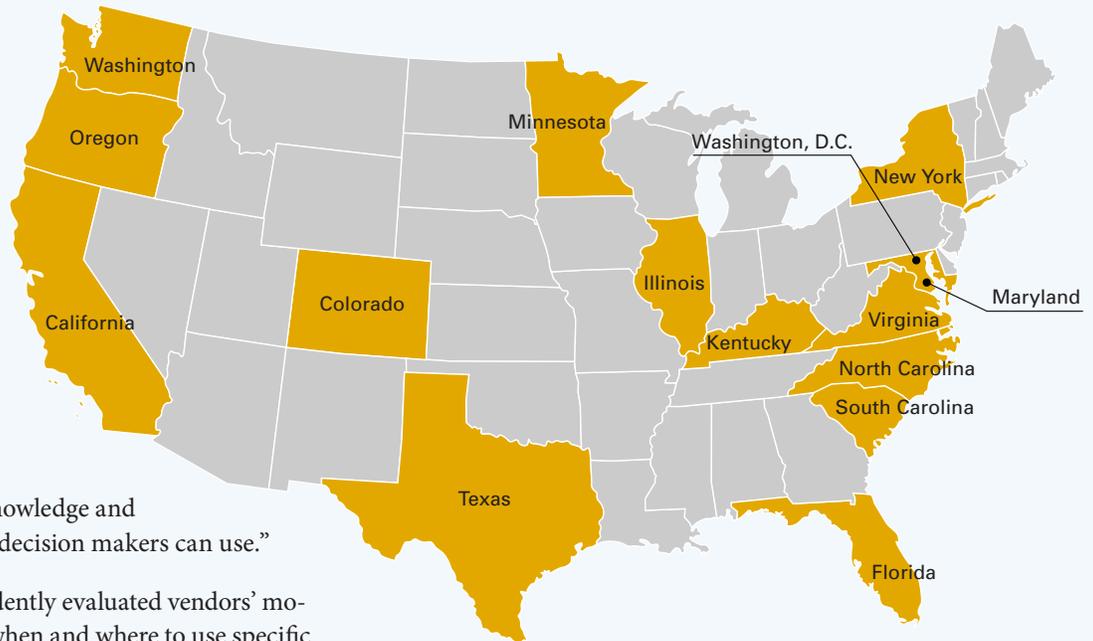
“The researchers always seem to be working on the critical questions that we’re asking; they address the most pressing issues that help us move forward in managing congestion and improving reliability. They were the only group to issue any examples of data-driven target setting for the first federal reporting period, and the recent Reliability Synthesis has proven very helpful in our goal to more cost-effectively invest in reliability improvements.”

Mena Lockwood, Assistant State Traffic Engineer, Virginia DOT

For over 35 years, the Texas A&M Transportation Institute’s (TTI’s) urban mobility research efforts have developed a comprehensive set of performance measures and tools to measure and monitor mobility conditions in urban America. The Texas Department of Transportation (TxDOT) was the founder and sponsor of the research and initial implementation of the tools developed from it. For the last 21 years, a pooled fund study involving a combination of state departments of transportation (DOTs), metropolitan planning organizations and the Federal Highway Administration has continued to support and enhance this work. The analysis procedures and resulting measures have been used in multimodal measurement in many U.S. urban areas, at the state level, and in other countries.

“The pooled fund effort ensures that the analysis procedures and congestion strategies continue to evolve and help agencies be current and relevant with their performance measures and the datasets powering them,” says Casey Dusza, TxDOT statewide planning branch manager. “This information allows agencies to communicate effectively with their traveling public.”

Current Pooled Fund Members



Since our transportation system and available data sources are always changing, the study has transitioned several times. “As we understand more, we are extending the study to develop and test measures of system reliability, system resiliency, freight throughput, multimodal analyses and related areas,” explains TTI Senior Research Engineer Bill Eisele. “We’ll be expanding our look at how to transform big-data sets into knowledge and communication elements that decision makers can use.”

For example, TTI has independently evaluated vendors’ mobility data so the DOTs know when and where to use specific kinds of data for various scenarios and problems. Which data you use depend on the problem you’re trying to solve.

To address evolving requirements for multimodal performance, researchers are looking at performance measures and improving “what-if” scenario tools and visualization techniques to identify and display possible solutions and their potential benefits.

The annual sponsor meeting and periodic site visits enable research staff and the funding partners to share challenges, successes and state-of-the-practice techniques. The visits also facilitate learning from each other in engaged settings, as occurred at the most recent annual meeting in Kentucky. Along with providing study updates and developing the next year’s sponsor-driven work plan, the group had a night tour of the UPS World Port in the Louisville airport to examine ways for innovating freight movement.

The study products meet a variety of needs and include a range of printed and electronically accessible reports, data and information pages, and applications. A generally accessible website is also being developed for sharing of findings, recommendations and ideas.

“MnDOT is a charter member of the pooled fund study and for more than 20 years has received countless benefits related to urban mobility research efforts that have resulted in a comprehensive set of performance measures and tools to measure and monitor mobility conditions.”

Paul Czech, Planning Manager, Minnesota DOT

“Working with the TTI staff over the years on the pooled fund study has been rewarding and beneficial to the Colorado DOT. Participation has been invaluable in gaining critical information regarding the mobility challenges facing Colorado and other states participating in the study.”

Mehdi Baziar, Mobility Manager, Colorado DOT

While products are largely centered on urban mobility issues, the team also synthesizes related hot topics. Study topics identified by sponsors for the next phase of the study include:

- Project prioritization practices and methods.
- Advanced Tableau guidance for transportation uses.
- A data consumer report allowing sponsors to make informed decisions about data products.

“We’ve found that none of the sponsors have the same traffic mobility challenges, so it’s important to have more people around the table to better understand these issues,” says TTI Senior Research Scientist David Schrank. “Having differing viewpoints and perspectives helps generate creative solutions.” ■



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Good News, Bad News

Urban Mobility Report *Underscores Economy-Traffic Connection*

To take the nation's economic temperature, analysts follow a mix of indicators, like inflation, gross domestic product and consumer confidence. They can now add freeway congestion to the list because if more Americans are working, more of us are also tied up in traffic.

That picture is painted clearly in the *2019 Urban Mobility Report*, published by the Texas A&M Transportation Institute (TTI). The research, examining conditions in 494 urban areas across all states and Puerto Rico, was sponsored by the Texas Department of Transportation (TxDOT) and supported by INRIX, a leading provider of transportation data and analytics.

Along with illustrating the problem, researchers also stress the same straightforward solutions they've long advocated: more of everything — building more roads, increasing transit use, squeezing as much efficiency out of the existing system as possible, reducing demand through telework, better balancing demand and roadway capacity by adjusting work hours, and smarter land use.

"No single approach will ever solve this complex problem," says TTI Regents Fellow Tim Lomax. "We know what works. What the country needs is a robust, information-powered

conversation at the local, state and national levels about what steps should be taken. We have many strategies; we have to figure out the right solution for each problem and a way to pay for them."

The United States added 1.9 million jobs from 2016 to 2017 — slower growth than the 2.3 million-plus growth in four of the five previous years but more than enough to exacerbate the nation's traffic woes. TTI's gridlock data extend back to 1982, when Ronald Reagan was in his first term, a postage stamp cost 20 cents, and gas was about \$1.25 a gallon. Since that time, the number of jobs in the nation has grown almost nonstop by just over 50 percent to the current total of 153 million. Furthermore:

- The number of hours per commuter lost to traffic delay has nearly tripled, to 54 hours a year.
- The annual cost of that delay per commuter has nearly doubled, to \$1,010.
- The nationwide cost of gridlock has grown more than tenfold, to \$166 billion a year.
- The amount of fuel wasted in stalled traffic has more than tripled, to 3.3 billion gallons a year.

“The value of investing in our nation’s transportation infrastructure in a strategic and effective manner cannot be overstated as these added costs impact our national productivity, quality of life, economic efficiency and global competitiveness,” notes Marc Williams, deputy executive director of TxDOT, which funded the TTI research. The 2008–2009 recession produced only a brief pause in traffic congestion growth, which bounced back at an even quicker pace than associated job recovery.

The result is that the average freeway traveler has to allow almost twice the expected trip duration to ensure dependable arrival for time-sensitive things like medical appointments, day-care pickup and airline flights. Instead of the 20 minutes needed in light traffic, it’s best to plan a 34-minute trip.

“Those minutes don’t sound like much, but they add up quickly over a year,” says TTI Senior Research Scientist David Schrank. “Eventually, we’re talking billions of wasted hours, and the cost of delay at that scale is just enormous.” Simply put, travel demand is growing faster than the system’s ability to absorb that demand. Once considered a problem exclusive to big cities, roadway gridlock now afflicts urban areas of all sizes and consumes far more of each day, making “rush hour” a long-outdated reference.

“The problem affects not only commuters, but also manufacturers and shippers whose travel delay costs are passed on to consumers.”

Bill Eisele, TTI Senior Research Engineer

“The problem affects not only commuters, but also manufacturers and shippers whose travel delay costs are passed on to consumers,” says Bill Eisele, TTI senior research engineer. “While trucks constitute only 7 percent of road traffic, they account for 12 percent of congestion cost.”

Researchers emphasize that it’s urgent for the nation to develop consensus on specific strategies for each urban travel corridor now since major projects, programs and funding strategies take a decade or more to develop and bear fruit.

Almost every strategy works somewhere and in some situation, they say, and almost every strategy is the wrong idea in certain places at certain times. Using a balanced and diversified approach that focuses on more of everything — tempered by realistic expectations — is the best way forward.

For a nationwide interactive map of congestion conditions, visit <https://mobility.tamu.edu/umr/>. For dozens of ways to address roadway gridlock, visit <https://policy.tti.tamu.edu/congestion/how-to-fix-congestion/>. ■

2017 U.S. CONGESTION BY THE NUMBERS



494

U.S. Urban Areas Studied

~3.5

Average Daily Time for “Rush Hours” Across All Cities



25%

Peak-Period Travel Classified as “Congested”

8.8 BILLION

of Extra Hours All Commuters Spent in Congestion



54

of Hours the Average Commuter Spent in Congestion

34 MINUTES

Total Time (to arrive reliably on time for important trips) for a 20-Minute Trip in Light Traffic



40%

5-Year Increase in Truck Operational Costs (Billions of \$)



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TTI's New Headquarters Building Officially Open for Business

On Sept. 4, the Texas A&M Transportation Institute (TTI) hosted a ribbon-cutting ceremony for its new state headquarters located on The Texas A&M University System RELLIS Campus. The multilevel, 178,380-square-foot facility supports research programs and administrative offices for TTI's Bryan-College Station staff, previously housed in four different facilities. The TTI Headquarters building at RELLIS marks the first time since TTI's early days that local staff are officed in a central location.

"TTI is indeed fortunate to have the support of everyone here today at this particular time in history when transportation has never been more important to our state and to our country," TTI Agency Director Greg Winfree said. Winfree was joined in the stage party by John Sharp, chancellor of the A&M System; Al Alonzi, Texas Division administrator with the Federal Highway Administration; James Bass, executive director with the Texas Department of Transportation (TxDOT); Dan Chen, vice president and general manager with the 3M Transportation Safety Division; David Cain, chair of the TTI Advisory Council and president of David Cain Consulting; and Kelly Templin, director of RELLIS.

TTI's Headquarters joins other Institute facilities — the Roadside Safety and Physical Security Division's Proving Ground, the Environmental and Emissions Research Facility, and the Sediment and Erosion Control Laboratory, among others — already located at RELLIS. Built for \$71.8 million, TTI's Headquarters follows Leadership in Energy and Environmental Design Silver guidelines, ratings developed by the U.S. Green Building Council to promote sustainable construction.

"There's a lot of magic to Texas A&M — but the big magic with Texas A&M is two things: the students and the agencies. Sixty percent of all the research being done at Texas A&M is through the agencies. That's why we're number one in the Southwestern United States in terms of research."

John Sharp
A&M System Chancellor



“It’s wonderful to be here, in your new digs. We had the first concept for what RELLIS is about, and here comes TTI with an idea for a brand new building,” Sharp recalled for attendees. “There’s a lot of magic to Texas A&M — but the big magic with Texas A&M is two things: the students and the agencies. Sixty percent of all the research being done at Texas A&M is through the agencies. That’s why we’re number one in the Southwestern United States in terms of research.”

After hearing from the speakers, TTI hosted a reception, and participants were invited on guided tours of TTI’s Driving Simulation Laboratory and Visibility Research Laboratory, both located on the first floor, among other building areas. Sponsored by TTI and Texas A&M Transportation Services, an autonomous shuttle demonstration began on the Texas A&M University campus Sept. 9 and will run through Nov. 15. TTI Senior Research Scientist Bob Brydia leads a research team exploring the opportunities and challenges associated with implementing autonomous vehicles. Treated

“TTI is indeed fortunate to have the support of everyone here today at this particular time in history when transportation has never been more important to our state and to our country.”

*Greg Winfree
TTI Agency Director*

“Together TTI and TxDOT have made things better for motorists, our state and our nation. We’ve built a great partnership with TTI, and we look forward to a fabulous future.”

*James Bass
Executive Director, Texas Department of Transportation*

to a taste of what’s to come, ribbon-cutting guests rode in the driverless shuttle around the headquarters parking lot.

“As you can see, our relationship with TTI is best described as a two-way street. We collaborate to make things better for motorists and our state, and TxDOT is very proud of our relationship,” Bass said, lauding the nearly seven-decade relationship between TTI and TxDOT. “Consider that — from one idea, decades ago — the two powerhouses of TxDOT and TTI have created a transportation network that is the envy of the world. Together TTI and TxDOT have made things better for motorists, our state and our nation. We’ve built a great partnership with TTI, and we look forward to a fabulous future.” ■



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2019 CONFERENCE FOCUSES ON HEROES OF CHILD PASSENGER SAFETY COMMUNITY



A small army of advocates was recognized for their work at the third annual Texas Child Passenger Safety Conference, held in Austin July 29–31. Most of the 270 attendees were child passenger safety seat technicians (CPSTs) from across Texas. Conference participants learned how tragedies can sometimes make people inspirational activists for change.

Conducted by the Texas A&M Transportation Institute (TTI) and Texas A&M AgriLife Extension, the conference helps CPSTs stay up to date on new child seat technologies and offers continuing education credits toward CPST recertification.

Featured speaker Terry Smith was a Utah Highway Patrol trooper in 1995. He became the first CPST in Utah after

investigating the death of a two-year-old girl, Allison, who died in a crash in which her booster seat was too large for her size.

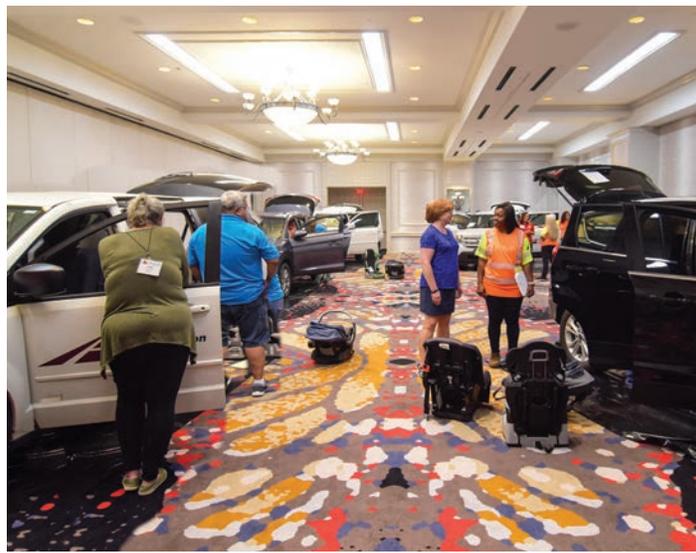
“Allison died while I was trying to save her,” Smith told the audience. “Her death had a profound impact on me. I made a promise to her parents, and it became my mission to make sure other kids were safe. My story is

not about me; it’s all about Allison,” Smith said, still visibly shaken by the 24-year-old crash that changed his life. Since becoming a CPST, Smith says he’s personally checked more than 1,300 car seats and has taught numerous others to become CPSTs. He’s sure that lives have been changed and saved as a result.

Just a year before the Utah crash, a crash near Snyder, Texas, changed the life of Karen Slay, who was instrumental in the passage of the “Kid’s Aren’t Cargo” legislation that prohibits anyone younger than 18 from riding in the bed of a pickup truck. The law went into effect in 2001. The crash that prompted her advocacy involved eight children who died after being thrown from the pickup’s

“We must constantly remind ourselves of the importance of what we do and celebrate the progress we have made, while knowing there is so much more left to do. It’s going to take all of us working together to keep our children riding safely on our roadways.”

*Carol Campa
TxDOT Traffic Safety Division*



IN 2018

62 Texas traffic crash fatalities involved children under the age of eight.

bed following a collision with an 18-wheeler. In the years following the crash, Slay not only raised the national awareness of the dangers associated with children riding in pickup beds, but also became a CPST and an instructor.

Karen Slay's life was celebrated at the opening session of the conference. "It's not too much of a stretch to say that every child in Texas is a little safer today because of the efforts of Karen Slay," said Karen Peoples, a Texas Department of Transportation (TxDOT) behavioral traffic safety specialist in Lubbock and Slay's friend. Slay died earlier this year after a battle with cancer. "Her legacy lives on in the countless lives she saved during her time in child passenger safety, but also in the connections she made with other individuals that work in this very important field."

In 2018, there were 62 Texas traffic crash fatalities that involved children under the age of eight. "Sixteen of those children were unrestrained at

the time of the crash," Carol Campa of the TxDOT Traffic Safety Division told attendees. "We can all agree that this is completely unacceptable."

Campa applauded the CPSTs, reminding them that their work helps children go home safe after a safety seat checkup. "We must constantly remind ourselves of the importance of what we do and celebrate the progress we have made, while knowing there is so much more left to do. It's going to take all of us working together to keep our children riding safely on our roadways."

Among the numerous conference sessions, attendees learned how children's bodies react in crashes involving front- and rear-facing seats, research on car seat installation techniques, how to develop a coalition approach to child safety advocacy, and how automated vehicle technologies could positively impact child safety.

"But even with all the future technologies and all the changes that are going to happen in the

"It's gratifying to know that these technicians will be going back to their communities with renewed energy and knowledge to help keep children riding safely."

*Katie Womack
TTI Senior Research Scientist*

coming years, I want you to please remember that nothing can replace you," said Maggi Gunnels, the Region 6 administrator for the National Highway Traffic Safety Administration. "You are part of this community, you do the work, you are passionate, and you volunteer. Technology is great, but it's not going to happen without you."

TTI Senior Research Scientist Katie Womack, project director for the conference, says, "It's gratifying to know that these technicians will be going back to their communities with renewed energy and knowledge to help keep children riding safely." ■



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TEXAS PEDESTRIAN SAFETY FORUM Sets New Attendance Record

Walking is the oldest form of transportation on the planet, but it's ever in need of new ideas to make it safer. That urgency was recently on display at the annual Texas Statewide Pedestrian Safety Forum, hosted Aug. 22 by the Texas A&M Transportation Institute's (TTI's) Center for Transportation Safety (CTS) and sponsored by the Texas Department of Transportation.

"Addressing pedestrian safety requires both commitment and collaboration," says TTI Senior Research Scientist Michael Manser, who led the forum. More than 175 participants attended the forum, a new record, Manser notes. The forum's growing popularity is evidence that those who attended are taking the challenge seriously to improve pedestrian safety — a challenge that has only grown in recent years, according to Ivan Cheung of the National Transportation Safety Board.

"Vehicles and roads have become safer," Cheung told the group, "but sometimes at the expense of vulnerable road users." As a result, pedestrian deaths account for a steadily rising share of overall traffic fatalities in the United States: from 11 percent in 2007 to 16 percent now, according to the National Highway Traffic Safety Administration.

"Vehicles and roads have become safer but sometimes at the expense of vulnerable road users."

*Ivan Cheung
National Transportation Safety Board*

Stemming that tide is especially difficult in fast-growing urban areas, and Texas is increasingly more urban and more diverse, said State Rep. Celia Israel. The Texas lawmaker highlighted her own interest in

roadway safety issues, which include a desire to lower residential speed limits, a policy change that she said she plans to pursue when the Texas Legislature meets again in 2021.



Pedestrian Deaths
are on the rise

11% in 2007
UP TO
16% in 2019

Israel also applauded the attendees for their work. "I'm a legislator who believes in data, and you're my favorite kind of audience; you're the experts," she said. "I encourage you to do more of this [kind of work]."

Participants focused their attention on a wide range of topics and issues. Those included policy debates, equity and trade-offs in design and implementation, bridging the pedestrian safety communication gap, and law enforcement considerations. In all respects, discussions centered on the need for new ideas, a viewpoint reinforced by CTS Director Robert Wunderlich.

"This really is a crisis, and we must start to look at new ways of doing things," he told forum participants. "We can do this together, and we can only do this together." ■



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TTI Advisory Council Meets at New Headquarters



The Texas A&M Transportation Institute (TTI) Advisory Council met at TTI's new headquarters at The Texas A&M University System's RELLIS Campus Sept. 4-5, following the ribbon-cutting ceremony for the new facility. The meeting began with an evening reception, dinner and update from Dan Chen, vice president and general manager of the 3M Transportation Safety Division. Chen discussed perspectives on roadway safety and the impact of connected and automated vehicles.

The business meeting commenced with a welcome and introductions by David Cain, council chair. TTI Agency Director Greg Winfree provided an update on the Institute and its recent research and partnership initiatives.

The council then toured the Driving Simulator and Visibility Research Laboratories in the Headquarters building and took a ride on an autonomous shuttle, which is being demonstrated on the Texas A&M University campus this fall by TTI and Texas A&M Transportation Services. Afterward, the group boarded a bus for a tour of the RELLIS Campus and viewed a roadside safety crash test of a pickup truck running into a guardrail transition at 62 mph.

Following the TTI tours and crash test, TTI Deputy Director Bill Stockton led a lunch discussion held at the A&M System's Center for Infrastructure Renewal (CIR) about potential research opportunities and transportation issues facing the state. Before adjourning, the council toured the CIR laboratories where TTI's pavements, materials and structures research is conducted. ■



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TTI's Tooley and Other Top Women Executives Share Inclusion Strategies



Tooley

Melissa Tooley, TTI director of external initiatives, joined three other top female

transportation industry executives on Sept. 23 on a panel made up of American Road and Transportation Builders Association's (ARTBA's) Women Leader Awards winners, which included the Institute. TTI was awarded ARTBA's Glass Hammer Award in 2011 for its promotion of women leaders within TTI and more generally in the transportation industry. The award is given "to at least one company in the transportation construction industry that has innovative programs and activities directed at successfully promoting women leaders within their organization."

The panel occurred as part of ARTBA's 2019 National Convention in Savannah, Ga., and addressed how to create, nurture and grow a diverse work environment. As Tooley, quoted in *Washington Newsline*, stated, "What is important to diversity issues is important to everyone. It's not just diversity; it's a work climate issue." As noted in the article, there are still more men than women in transportation, which emphasizes the need to continue and enhance diversity efforts across the industry.

"I never had female peers until I went to TTI," Tooley said (quoted in *Washington Newsline*). ■

Air Pollution Key Contributor of New Childhood Asthma Cases in Europe



Khreis

A study co-led by TTI Associate Research Scientist Haneen Khreis finds that up to 11 percent of new childhood asthma cases could be prevented each year if European countries complied with current World Health Organization air quality guidelines. Overall, 33 percent of new asthma cases in the 18 European countries studied can be attributed to air pollution levels.

Asthma is the most common chronic disease in children, and air pollution increases the risk of developing the disease. The new study estimates the burden of new childhood asthma amongst 63.4 million children and focused on three key pollutants: PM_{2.5} (33 percent), nitrogen dioxide (23 percent) and black carbon (15 percent).

"Our findings reinforce the case that air pollution is contributing substantially to the burden of pediatric asthma," Khreis notes. "This new analysis is a call for urgent action. These impacts are preventable. We can and should do something about it."

The 18 European countries studied are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. Countries from Eastern Europe were not included due to the lack of air pollution exposure data in the region. ■

TTI's Lomax Testifies Before the U.S. House



Lomax

TTI Research Fellow Tim Lomax testified before the Highways and Transit Subcommittee of the U.S. House Transportation and Infrastructure Committee on Sept. 11. The subject of the hearing was traffic congestion and potential solutions to improve mobility. Lomax discussed the newly released *Urban Mobility Report*, which includes congestion estimates and the implications for urban transportation.

Lomax outlined the big-picture questions of addressing congestion, including what to do, what that would cost, how to pay for it, what the benefits are to do something, and what the negatives are for doing nothing. As an example, he compared the costs of maintaining the 2010 condition of Texas roads and highways (\$273,000,000 over the next 25 years) with the economic impact associated with doing nothing (\$989,000,000).

"It's clear that doing nothing is not free," Lomax told Congress. "Congestion problems will continue to challenge metropolitan regions of all sizes. This is not just a big-city problem." ■

Perez Wins ATSIP Award for Data Visualization

TTI Assistant Research Scientist Marcie Perez won first place in the data visualization category for “investigating crash data through data visualization” at the 2019 Traffic Records Forum. The forum, held Aug. 4–7, was hosted by the Association of Transportation Safety Information Professionals (ATSIP). Perez led the Aug. 6 session Data Visualization: Investigating Crash Data Through Data Visualization.

ATSIP members are professionals from government, law enforcement, the private sector and university research centers. The association seeks to make traffic records more consistent, accessible and integrated for use in implementing and evaluating safety programs and policies. ATSIP’s data visualization award recognizes projects that raise decision-maker awareness about data visualization, provide resources to transportation safety organizations, and inform policy-making legislation.

TTI’s Center for Transportation Safety uses Microsoft Power BI, a data visualization software, to examine crash data. In her Aug. 6 session, Perez highlighted the most common ways attendees can leverage the software to fit their needs. Her work includes crash data analysis, database management, and form and survey development. She also provides technical support to TTI researchers working with Texas crash data.

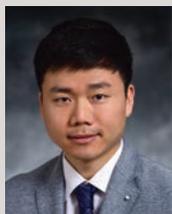
“I received very positive feedback on the visualizations I shared within TTI, and I was happy to receive the award for my session because it helps me to see that my work is helpful to others,” says Perez. ■



Perez receiving her award at ATSIP’s 2019 Traffic Records Forum.

TTI Graduate Students Receive APTF Scholarships

Two TTI graduate students received scholarships in the amount of \$6,500 each from the American Public Transportation Foundation (APTF) at the recent American Public Transportation Association’s (APTA’s) TRANSform Conference held Oct. 13–16 in New York. APTA is a nonprofit international association of more than 1,500 public- and private-sector member organizations. An affiliate of APTA, the foundation provides scholarships for transit scholars.



Hwang

Jinuk Hwang, now an assistant transportation researcher with the Institute, received the APTF Americans with Disabilities Act 25th Anniversary Scholarship, awarded to an undergraduate or graduate student who works to enhance accessible public transportation.

At TTI, Hwang conducts GIS and spatial analysis research, performs data collection and review, and prepares technical documentation for the Institute’s Transit Mobility Program.



Mahmoudzadeh

Ahmadreza Mahmoudzadeh was awarded the Gary Thomas Ambassadorial Scholarship, which is given to college students or transit professionals pursuing or advancing a career in the public transit industry. Also part of TTI’s Transit Mobility Program, Mahmoudzadeh’s research involves modeling, geospatial analysis, programming, Big Data analysis, visualization, transit scheduling and technical document preparation.

“Both Jinuk and Ahmadreza are deserving recipients for these scholarships, as well as excellent examples of how TTI is helping train the next generation of transit professionals,” states TTI Executive Associate Director Katie Turnbull, who also serves on Hwang’s Ph.D. dissertation committee. “Their contributions to transit research are just beginning, and as a member of APTA, the Institute was pleased to sponsor their scholarship applications.” ■

Wunderlich Receives Burton W. Marsh Award

TTI Center for Transportation Safety Director Robert Wunderlich received the prestigious Burton W. Marsh Award at the 2019 Institute of Transportation Engineers (ITE) Annual International Meeting in Austin, Texas, July 21–24. The Marsh Award is presented to an ITE member who’s made outstanding contributions to the organization’s advancement over the years.

In his acceptance speech, Wunderlich praised friends, colleagues and mentors who helped him along the way: “I think about the incredible colleagues I have shared my career with, collaborated with, and depended on. No person achieves much by themselves, and I have been blessed with an array of competent and caring people to work with everywhere I’ve been. And through it all, there is the one person who made it all possible, my wife, Fran. This is an award to many, not to one, because I could not have done much without them.”

Wunderlich encouraged everyone to do more to improve safety — from integrating safety analyses into all aspects of transportation studies and projects to thinking outside the box of accepted practices. He also urged the audience to give back to the profession in whatever manner befits the individual.

“When we take the time to make others in our profession better, it enriches us as individuals,” Wunderlich said. “Small acts add up over time into large paybacks, for you and for us as your colleagues.” ■

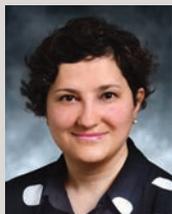


TTI Center for Transportation Safety Director Robert Wunderlich delivers his acceptance speech entitled “Make a Difference!” after receiving the Burton W. Marsh award.



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TTI Awarded Robert Wood Johnson Foundation Grant



Dadashova

TTI has received a \$250,000 grant from the Robert Wood Johnson Foundation (RWJF) to evaluate safety and health concerns related to implementing connected and automated vehicle (CAV) technologies. RWJF is the largest philanthropic organization in the United States dedicated solely to health, and the potential impact of adopting CAVs has yet to be studied in depth. The grant is part of a larger \$2.4 million initiative exploring the interrelationships among technology, infrastructure and health. The project also includes graduate student funding from TTI’s Safety through Disruption University Transportation Center.

“We are living in a time of unprecedented and increasingly rapid technological development,

where technologies are designed, developed and implemented without full consideration for their influence on human life, health and equity,” explains Paul Tarini, RWJF senior program officer. “This project at TTI will help cities develop a better understanding of how CAVs will impact the health of their residents.”

Researchers will conduct a literature review, collect and analyze data, develop a data visualization tool, and ultimately provide recommendations regarding the impact of new technologies on public health.

“There is great uncertainty associated with the health and equity implications of CAVs,” says TTI Associate Transportation Researcher Bahar Dadashova. “We’ve put together an interdisciplinary team to quantify the health impacts of CAVs along two key pathways: highway safety and traffic-related air pollution.” ■



Choice, Convenience and Customer Service

What Mobility Means in a Data-Driven Marketplace

Our definition of mobility is changing. At its most practical in transportation, *mobility* describes the safe and efficient movement of people and goods. But today that's only part of the story — an artifact of last-century thinking.

Today, we're linked through the Internet of Things, creating opportunities for efficiencies never dreamed of a mere generation ago. Data are shared nonstop from our smartphones, a precursor for the constant information exchange to come between automated vehicles and intelligent infrastructure. The 20th-century approach to increasing mobility by making individual travel modes more efficient is becoming moot, broken down by the system's reliance on intermodal data transfer. The smartphone, the car, the traffic signal, the website hosting your travel reservation — all communicate through the ether, working in the background to make our lives more convenient and, on the best of days, safer than ever before.

This operational evolution is spurring a corresponding change in how we view mobility, as seen in the Mobility as a Service (Europe) and Mobility on Demand (U.S.) initiatives. Mobility is being redefined as a quantifiable service, with its relative value determined by the marketplace of transportation consumers. Renting a car can be expensive when you travel for work, but hopping an Uber or Lyft can meet your needs more sensibly. If you're a shipper — I'm looking at you, Amazon — maybe it's more efficient to drop that package off by drone than ship it via FedEx.

This à-la-carte approach promotes consumer choice and, like all sustainable services, focuses on convenience and cost as oft-competing performance measures. The combination of modes we'll choose to get us to work and home again in 2050 will depend on the benefit we perceive for each mode versus its cost. That's true today, of course — you can fly cross-country in hours instead of spending days

driving — but tomorrow, my menu of choices will be far more complex. Today's travel apps show you the quickest path to your destination, offering, for example, options to take toll roads to save time. I'll go on record and say that, in the future, these apps will also offer a menu of modes you can mix and match for one trip to achieve the most satisfying and cost-effective travel experience.

From the invention of the saddle and stirrup to Ford's Model T and beyond, technological innovation and human ingenuity have always worked together to advance mobility. Combined, they pull the potential of genius into the realm of the possible. As our system becomes more integrated and its constituent parts less easily differentiated, so too must our outlook become more holistic. Data are the mathematical language that will tell the story of transportation's future.

We just need to make sure we're listening. ■

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