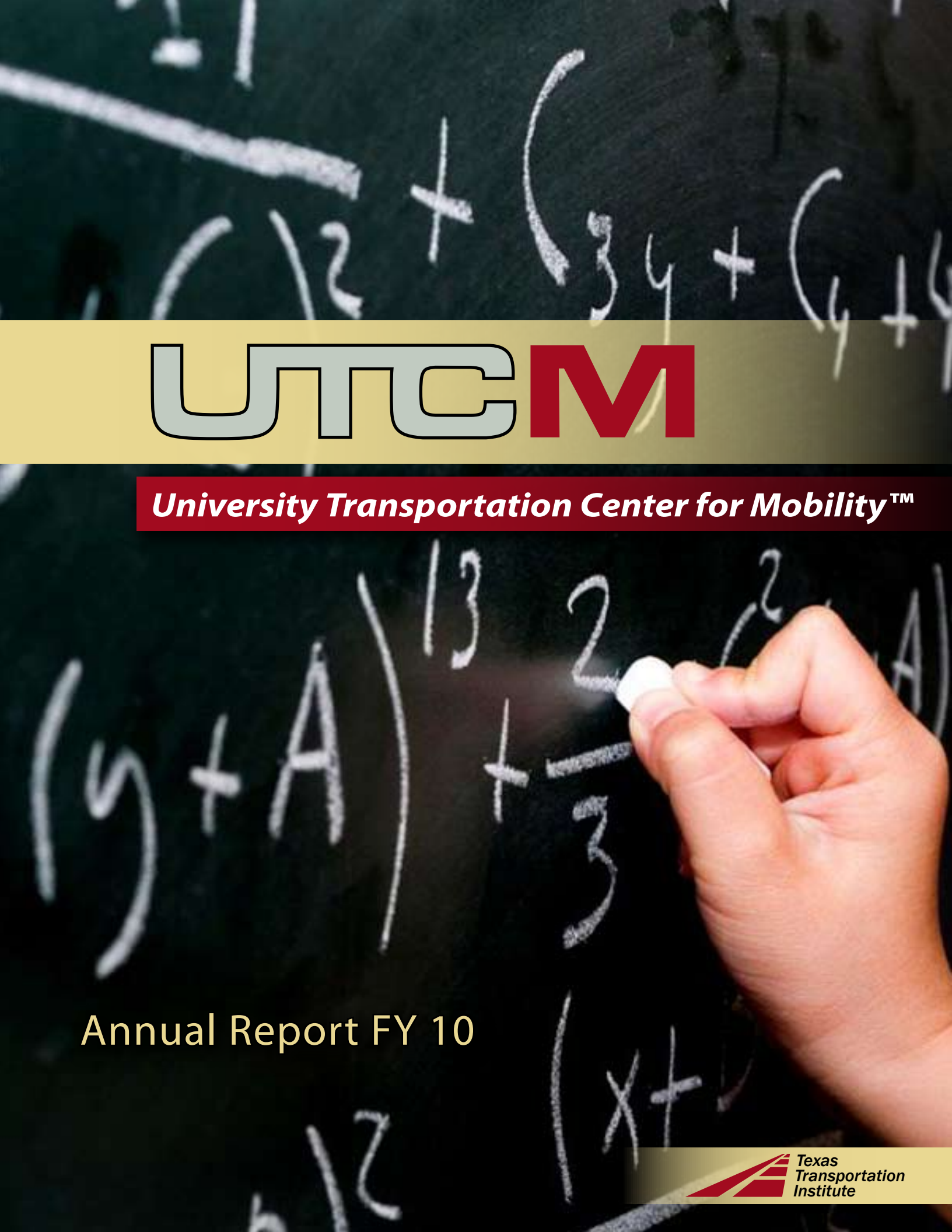
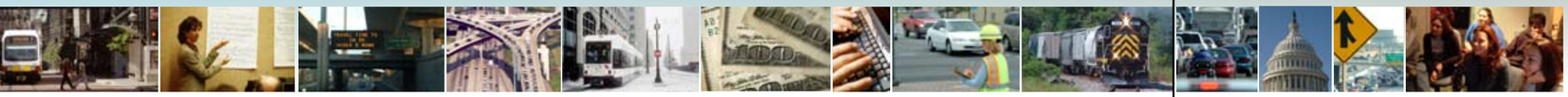


UTCM

University Transportation Center for Mobility™

Annual Report FY 10

Texas Transportation Institute



A report of activities of the

University Transportation Center for Mobility™

Funded by USDOT, Research & Innovative Technology Administration

University Transportation Centers Program

Report Period: September 1, 2009 - August 31, 2010

Texas Transportation Institute

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UTCM THEME

Improving the quality of life by enhancing mobility

through innovations in

RESEARCH, EDUCATION, and **TECHNOLOGY TRANSFER**

UTCM FOCUS AREAS

- *Coast-to-coast, border-to-border mobility*
- *Rural public transportation*
- *Congestion management and mitigation*
- *Innovative financing*

DIRECTOR'S MESSAGE

How are the UTCs actively engaged in developing the next generation of transportation professionals? Sometimes the education component of the UTCs seems to be overshadowed by its research programs. In fact, one of the greatest impacts of the UTC program is its ability to enrich the educational experience of tomorrow's transportation workforce.

You will notice an education theme throughout this issue of UTCM's Annual Report. UTCM has several different programs to enhance education opportunities for aspiring transportation professionals. These include:

- Required student involvement on all UTCM research projects
- UTCM Fellowships
- Stand-alone UTCM Graduate Assistantships
- UTCM Student of the Year
- Student travel grants
- Course development
- Curriculum development

All UTCM research projects are required to involve students in the work, but this is just the beginning. We award UTCM Fellowships to superior students. We also offer stand-alone graduate assistantships, which provide salary and tuition support for a student to conduct research that is not tied to a specific UTCM project. See page 6 for a report on how Qing Miao is benefitting from a UTCM assistantship.

All UTCs name a Student of the Year (SOY), who receives a cash award and travel to TRB. The SOYs are then recognized at the CUTC Banquet. But UTCM has gone further to offer opportunities for students to travel to other conferences and meetings. For example, Suzie Edrington was awarded a UTCM travel grant to attend the annual meeting of the Women's Transportation Seminar (WTS). On the next page is an article detailing her experiences, including witnessing Transportation Secretary LaHood signing an agreement between USDOT and WTS. This alliance will help more women like Suzie gain the education and experience they need to advance in transportation careers.

Other examples of UTCM-sponsored educational enhancements include developing new courses and even entire curricula. For example, Texas A&M's Graduate Certificate in Transportation Planning, developed in 2008 by UTCM Executive Committee member Dr. Forster Ndubisi, has awarded 17 certificates. Over a dozen more students will soon follow, including former UTCM Student of the Year Ben Sperry, who is profiled on page 7.

Perhaps the education program means more to me than most due to my personal experience. UTC funding supported my graduate work at the University of Arkansas, and I was the first Student of the Year there. So I well remember my first TRB function and its lasting impact on my career. At the time, I was a financially struggling student and this program enabled me to stay in school and eventually embark on an academic career. So it is a special privilege for me to be able to "pay it forward" to others.

Educationally Yours,

Melissa S. Tooley

Melissa S. Tooley
Director, University Transportation Center for Mobility™

Suzie Edrington

Masters Student

Landscape Architecture and Urban Planning
Texas A&M University

UTCM Graduate Student Witnesses Alliance Between Department of Transportation and Women's Transportation Seminar

UTCM recently reinforced one of its goals to diversify the transportation workforce, awarding UTCM researcher and Texas A&M University graduate student Suzie Edrington a travel grant to participate in the Women's Transportation Seminar (WTS) annual conference in Washington, D.C. WTS is an international organization dedicated to the advancement of women in transportation through professional development, mentoring, and strategic positioning of women.

"At the WTS conference, I learned a great deal about transportation initiatives at the national and state levels," said Edrington. "I was able to network with many professional women – and a few men, too."

While WTS attendees including Suzie Edrington witnessed, Transportation Secretary Ray LaHood signed a memorandum of cooperation between the U.S. Department of Transportation (DOT) and WTS International. This memorandum encourages women to complete undergraduate and graduate degrees in science, technology, engineering and math – without having to put their transportation careers on hold.

The joint initiative will support the advancement of Science, Technology, Engineering and Mathematics (STEM) and is aimed at helping more women advance in transportation careers. WTS President Elaine Dezenski said, "We're excited to launch this partnership with DOT and to help develop the transportation workforce of the future."

Secretary LaHood adds, "We are also deeply committed to supporting women in every field of transportation – and we are reaching out to girls and young women who are looking for rewarding careers. I think this new understanding with WTS will prove to be another successful partnership that helps women in transportation seize opportunities they might otherwise miss."

"It was a particular honor to stand behind Secretary LaHood as he signed the agreement with WTS," Edrington said. "This agreement is designed to promote opportunities for women like me who are pursuing careers alongside undergraduate and graduate degrees in transportation."

In addition to receiving a UTCM student travel grant, Suzie has conducted research on five UTCM projects, acting as principal investigator on two of them. "We are extremely pleased to support the career advancement of this prolific researcher," said UTCM Director Melissa Tooley.

Edrington will earn a Masters in Urban Planning from Texas A&M University's College of Architecture in December 2010, with the Graduate Certificate in Transportation Planning.

UTCM researcher and Texas A&M University graduate student Suzie Edrington (far right) looks on as Transportation Secretary LaHood signs a memorandum of cooperation between USDOT and the Women's Transportation Seminar. LaHood is seated with WTS President Elaine Dezenski.

John Lowery Named UTCM Student of the Year for 2009

John Lowery

Masters Student
Zachry Department of Civil Engineering
Texas A&M University
UTCM Student of the Year, 2009

In December 2009, the UTCM selected its 2009 Student of the Year, Mr. John Lowery. John received his BS in Civil Engineering from the University of Texas. As a full time Master's student in Civil Engineering at Texas A&M University, he has maintained a perfect 4.0 GPA.

John has participated in two UTCM projects and a Federal Highways Administration (FHWA) project researching managed lanes near San Antonio, Texas. He served as treasurer of the Texas A&M Institute of Transportation Engineers (ITE) student chapter for one year and has participated in several professional activities including the Texas ITE summer meeting in San Antonio, the Transportation Research Board (TRB) annual meeting, and meetings of the local chapter of ITE.

Last year, John was recognized by the Southwest Region University Transportation Center (SWUTC) as the best overall transportation student at Texas A&M University.

A SOY's-Eye View

by UTCM Student of the Year John Lowery

Receiving the UTCM Student of the Year award was memorable both for the professional opportunities it afforded me and the personal ones. The experience was particularly unique for me as I was just finishing school and about to start my career, so the SOY award provided a bittersweet opportunity to say farewell to friends and colleagues and to network with new people with whom I would soon be working.

At the Council of University Transportation Centers (CUTC) banquet I spoke with distinguished students, award-winning educators and professionals from around the country, reinforcing just how vibrant the transportation field is.

The keynote address by Congressman Rick Nahall of West Virginia was particularly interesting; he spoke of the current legislative climate for future federal transportation funding. I was honored to be included among such a distinguished group.

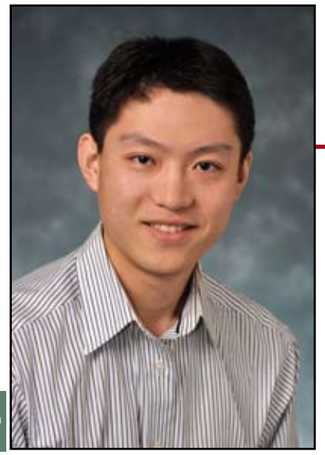
For students like me, the annual TRB meeting is exciting in two ways: we get to put faces with all the names we encounter in our studies and we get to visit one of the greatest cities in the country. I spent my days in meetings related to managed lanes and congestion pricing. Shaking hands with pioneers whose work I have cited made me feel starstruck at times.

Attending TRB also allowed me to see our nation's capital. The highlight of my free time came when I observed a live session of the Supreme Court. What a thrill it was to be in a room with the nine justices responsible for interpreting the U.S. Constitution.

Thank you, UTCM!

John Lowery receives his SOY award certificate from CUTC President Bob Plymale (left) and RITA Administrator Peter Appel (right).

UTCM Student Activities



Investigating the Value of Time: 2009 UTCM Graduate Assistantship Recipient Qing Miao

Qing Miao

Civil Engineering Masters Student

UTCM Graduate Assistantship Recipient, FY09-FY10

As a civil engineering graduate research assistant at Texas A&M University, Qing Miao works under the supervision of Dr. Bruce Wang, Assistant Professor of Civil Engineering. Under Dr. Wang, Qing initially worked on a Federal Highways Administration (FHWA) project analyzing traffic patterns by calculating the average travel time on segments of highways in Texas.

"We looked at commercial trucks traveling from the U.S.-Mexico border to major cities like San Antonio," says Qing. "My job was to 'clean' the data to determine the part that is useful to calculate hourly travel speed. The data then go into a GIS [geographic information system] so we can see the average travel speed on each highway segment and observe the network's traffic patterns."

> ***"The work Qing Miao is doing for the UTCM is like the work he will be doing in his career, giving him real experience he can apply."***
>
> ***Dr. Bruce Wang***
> ***UTCM Researcher and***
> ***Qing Miao's Major Professor***

Based on this experience, Qing was selected to receive a stand-alone research assistantship from the UTCM valued at over $43,000, which provided him with a stipend and tuition for FY10 to continue working with Dr. Wang. He then began to assist Dr. Wang on a project that is collaboratively funded by the UTCM and the National Center for Freight and Infrastructure Research and Education (CFIRE) in Wisconsin. The project is evaluating the value of time for commercial vehicles, and includes a stated choice survey of drivers and a roadway network simulation.

"The survey tells us how commercial drivers value their time," says Qing. "If they encounter congestion on the highway, how much would they like to pay to avoid it? Or, how much do they think this congestion will cost them? In the other project task, the simulation, we set up a simulated network and then introduce congestion to a certain segment. This tells us the value of delay – the increase in operating costs affecting the value of time."

Qing is pleased that his graduate research experience has included work on real projects in the field, not just on equations or theoretical classroom activities. "The work Qing Miao is doing for the UTCM is like the work he will be doing in his career, giving him real experience he can apply," says Dr. Wang.

"Working for Dr. Wang has been very helpful for me," says Qing. "He is very insightful and knowledgeable., and provides valuable opinions on the work I am doing. He double-checks whether something is doable. Several of my advisors helped as well." Qing also credits his assistantship from the UTCM, saying, "The assistantship I received gave me the support to work with Dr. Wang on an excellent project. I am grateful for the opportunity that the UTCM made possible. The project experience is invaluable."

Qing Miao will receive his M.S. in transportation engineering from Texas A&M in December 2010 and plans to pursue a Ph.D.

PhD Candidate Explores Many Facets of UTCM, Texas Transportation Institute, and Texas A&M

Ben Sperry

Civil Engineering PhD Candidate

UTCM Student of the Year, 2008
UTCM Mobility Fellow, FY08-FY09

At age 27, Ben Sperry not only has a professional interest in mobility, he has a personal one as well: "I've traveled to 49 of the 50 U.S. states" You could say the PhD candidate and UTCM Fellow has considerable firsthand experience with his chosen profession.

In 2008, Ben Sperry arrived from Illinois to study civil engineering at Texas A&M University. "My undergraduate degree was in general civil engineering, but I knew I wanted to do transportation. I chose Texas A&M for graduate school because it offered such a wide variety of specialties to help me decide which area of transportation I wanted to study. And A&M also offered the most financial support among the schools I considered." Part of Ben's financial package included a $13,000 UTCM Fellowship.

Ben was named UTCM's Student of the Year for 2008. And in 2010, he's continuing his research in transportation as a graduate assistant researcher with the Multimodal Freight Transportation Program at the Texas Transportation Institute (TTI).

> ***"Transportation affects everyone. UTCM's theme 'Improving the quality of life by enhancing mobility' really describes why I chose transportation. I want to work in transportation to make people's lives better."***
>
> ***Ben Sperry***
> ***Civil Engineering PhD Student***

"After being exposed to many different fields of study at TTI, I chose to focus on intercity passenger rail," says Ben. "This is a big time for passenger rail. People are talking about it and want to implement it. My focus is to understand how passenger rail supports mobility in major intercity travel corridors around the country. "

As UTCM's Student of the Year, Ben received a travel award to attend the Transportation Research Board (TRB) Annual Meeting in Washington, D.C. And the support of a two-year Mobility Fellowship from UTCM has allowed Sperry to pursue research and other opportunities he might not otherwise have been able to explore. "The fellowship allows me to continue to grow professionally," says Ben. "The financial support has allowed me to pursue independent scholarly work like writing papers for TRB and other organizations. Those publication activities are very important and will give me a head start in my career."

In 2011, Ben expects to earn his Ph.D. in civil engineering along with a Graduate Certificate in Transportation Planning. The certificate program, developed in 2008 by the UTCM, provides specialized training in transportation studies for graduate students across disciplines, preparing them to participate in cross-cutting solutions to the complex transportation problems facing the workforce.

"Transportation affects everyone. UTCM's theme 'Improving the quality of life by enhancing mobility' really describes why I chose transportation. I want to work in transportation to make people's lives better."

UTCM TECHNOLOGY TRANSFER

2010 CUTC Summer Meeting

Council of University Transportation Centers

June 7-9, 2010 • College Station, Texas

Hosted by UTCM, Southwest Region Transportation Center and Texas Transportation Institute on Texas A&M Campus

CUTC Summer Meeting speakers included Dennis Christiansen, Director of TTI, (top) and Steve Albert, Vice President of CUTC (bottom).

Texas hospitality with all the trimmings greeted the 125 participants in the Council of University Transportation Centers (CUTC) 2010 Summer meeting, held on the campus of Texas A&M University June 6-8, 2010.

Texas A&M is home to two UTCs – the University Transportation Center for Mobility and the Southwest Region University Transportation Center – as well at Texas Transportation Institute. All three acted as hosts for the meeting.

Participants included Peter Appel, Administrator of the US Department of Transportation's Research and Innovative Technology Administration (RITA), Jan Brecht-Clark, RITA's Associate Administrator for Research, Development and Technology, RITA program grant administrators, CUTC Vice President Steve Albert, and CUTC members, directors, administrators and support staff from the 60 UTCs across the country.

During two full days of meetings, participants engaged in lively discussion on UTC grant performance indicators, applications of social media to UTC objectives, transportation workforce development initiatives, achieving research excellence and developing and sustaining partnerships with private industry, AASHTO, ITS America, and others.

On the last half-day, a record 50 UTC administrators attended open-ended discussions on managing budgets during extensions, planning for the next authorization, TRB Research in Progress database maintenance, methods for communicating the UTC message to the public, politicians and stakeholders, reporting requirements, performance indicators, overhead return, matching and other concerns.

Texas-style social activities included a Mexican Fiesta buffet in the Texas Transportation Institute's newly dedicated State Headquarters and Research Building, tours of key TTI research laboratories, bar-b-que lunch in the Texas A&M Former Students Association, and a tour of the George Bush Presidential Library, located in Texas A&M University's Research Park.

> ***"[The CUTC meeting at Texas A&M] was well-planned, carefully orchestrated, focused, timely and enormously helpful to someone who has only been part of the UTC world for less than four years. It was so obvious the folks from A&M really cared about the quality of the meeting from the logistics to the content."***
>
> ***Dr. Russ Fine, Director***
> ***University of Alabama at Birmingham UTC***
> ***and CUTC Summer Meeting participant***

This technology transfer activity involved the collaborative efforts of:

UTCM University Transportation Center for Mobility, Texas Transportation Institute

SOUTH REGION WEST UNIVERSITY TRANSPORTATION CENTER

Texas Transportation Institute

UTCM Technology Transfer: K-12

Raghava Kommalapati, PhD, PE, BCEE

Interim Head and Associate Professor

Department of Civil and Environmental Engineering
Prairie View A&M University

Summer Transportation Institute Going Strong in Its Eleventh Year at Prairie View A&M University

Students of the Summer Transportation Institute (STI) at Prairie View A&M University are inspired by the energy and enthusiasm of the program's director, Dr. Raghava Kommalapati. "He's like the Energizer Bunny," says STI Scholar Assata Conway, a senior from Westside High School in Houston.

And the infectious energy of "Dr. K" – as he is known by the students – has been instrumental in growing the 11 year-old program. Kommalapati, Associate Professor and Interim Head and of the Department of Civil and Environmental Engineering at Prairie View, has been involved with his department's STI program from the start. "It's taken consistent time and energy over the years to build our contacts with schools and school counselors, and to find qualified students. And in recent years, this investment has really been paying off."

Since 2000, Kommalapati and his staff have built a successful recruiting network of over 250 schools and some 1,000 school counselors. This momentum has made it one of the two most popular summer programs on the campus. "For 2010, we had three applications for every spot in the STI program," reports Kommalapati.

Prairie View STI by the Numbers

11	*Years in operation at PVAMU*
190	*Students participating in STI*
8	*STI Scholars 2008-2010*
100%	*STI Scholars attending college after graduation*
75%	*STI Scholars choosing transportation related majors*
2,850	*Pizzas consumed at STI from 2000-2010*
432	*Popsicle sticks used to build one STI student's bridge in 2010*

Students and parents say it's the program that attracts them, but it's Dr. K and his high-energy staff – including teachers and college student mentors – who keep them excited throughout the weeks of the STI program. Participants live on the campus, attend classes to build Math and English skills, and learn about the wide range of transportation careers through hands-on activities, professional presentations, and research facility tours.

Beginning in 2008, with funding from the UTCM, Prairie View added an elite second year experience for STI students, known as the STI Scholars program. Two or three students are selected to return to STI the following summer where, through enriched activities, they gain deeper exposure to transportation careers. At the same time, they receive individual guidance in making college and career decisions. They also serve as mentors to first-year STI students.

"Of the five Scholars from 2008 and 2009," says Kommalapati, "all have gone on to college; two are Civil Engineering students here at Prairie View." The three 2010 Scholars will graduate high school this year, and all are leaning towards transportation-related college majors.

During a visit to the Texas A&M campus, STI Scholars observed as Dr. Emad Kassem demonstrated the CT Scanner used to characterize asphalt samples in TTI's Materials Testing Laboratory.

In 2010, Kommalapati faced some new challenges. "The Federal Highway Administration [FHWA] has invested in this program for 10 years. This past year, we learned after we had started recruiting students that FHWA funding was not available to us. We were extremely grateful that the UTCM extended their support so that we could offer the STI program in 2010."

STI students built and tested the strength of bridges made of Popsicle sticks.

With UTCM funding, Kommalapati was able to further develop the curriculum, including new activities and speakers, and streamline the program from four weeks to two. "A two-week program was better for our logistics, and, as it turned out, the students responded very well to the updated format."

UTCM has authorized funding for Prairie View's STI and STI Scholars program through 2012, and Kommalapati is seeking renewed funding from FHWA. "First Federal Highways and now UTCM have generously seeded STI for more growth," says Kommalapati. "Now, we plan to develop self-sustaining resources to ensure this important program continues to attract minority students and women to transportation-related college programs – and ultimately, to transportation careers."

This year's STI class at Prairie View A&M University included 17 first-year STI students and three STI Scholars returning for an in depth second-year experience.

UTCM Technology Transfer: K-12

Building Sustainable Workforce Development Programs

Debbie Jasek

Associate Research Specialist

Center for Professional Development
Texas Transportation Institute

The Texas Transportation Institute has long participated in successful programs to recruit high school students, especially minorities, to major in science, technology, engineering and math (STEM) programs at Texas universities. UTCM Researcher and TTI Research Specialist Debbie Jasek has a vision for more growth. "I've been participating in individual successful efforts at several locations across Texas for a long time now. What we need now is to develop and strengthen ties between sponsors and schools into long-term partnerships that are sustainable."

Jasek, an outgoing ex-Army Captain, is enthusiastic about a project she is heading up with UTCM funding to develop sustainability in several programs across Texas. "It costs surprisingly little to knit together these existing programs into long-term successes," says Jasek. Her two year, $29,000 UTCM technology transfer project includes coordinating and expanding operations and/or corporate sponsorship of three different workforce development programs. "You just have to get in there, talk to people, bring together existing resources and make new connections. That's what I do. Then after all the connections are made, and the program gets running, the resources are in place to continue it on its own power."

> ***"You just have to get in there, talk to people, bring together existing resources and make new connections ... Then after all the connections are made ... the resources are in place to continue it on its own power."***
>
> ***Debbie Jasek***
> ***UTCM Researcher***

The first program Jasek has improved with her UTCM funding is known as "Living and Working in the Coastal Zone." This program originated in Aransas Pass, TX as "Industry to Work Day," a STEM recruiting activity for high school students that included industrial and environmental activities, such as beach cleanup and field trips to industry. Then, partnering with the Gulf of Mexico Foundation, a non-profit organization that conducts outreach to coastal counties in STEM programs, the program evolved and grew, adopting the format of an event created by Jasek in a Southwest Region University Transportation Center (SWUTC) project known as "On the Move!" With advisory assistance from Jasek, the program has also gained sponsorship from the Texas General Land Office, Texas Parks and Wildlife Department, South Texas Nuclear Power, Valero and Wal-Mart. Two years ago, the program expanded to two more Texas communities, Edna and Port Lavaca. With plans underway for its fourth year, Jasek envisions that the program will continue to expand to coastal county school districts throughout Texas and Louisiana.

Another program fostered by Jasek involved connecting existing resources to solve a problem for school children in the impoverished rural colonias of Webb County. Says Jasek, "I happened to meet the director of the Imaginarium of South Texas [located in Laredo], and we began discussing the problem that children from the nearby colonias were not being exposed to the museum because they had no access to transportation to the museum facilities." Jasek knew that Texas A&M University's Center for Housing and Urban Development (CHUD) funded community centers in the colonias of Lago Vista and El Cenizo, and arranged for the centers to host monthly mobile museum shows for the rural school children. When not hosting shows, the community centers' computers can link children to on-line STEM enrichment activities.

Jasek's UTCM work also includes creating recruiting initiatives for STEM students at Texas College in Tyler, a historically black university (HBU). Jasek is helping the college's president Dr. Dwight Fennell to work with Wiley College in Marshall, Texas, another HBU, to replicate successful recruiting programs Dr. Fennell initiated when he was president of Paul Quinn College in Dallas. Jasek is also helping these Texas campuses develop proposals for federal funding.

Jasek's UTCM project will conclude in December 2010, but the sustainable programs she helped create will reach far into the future. As these initiatives are repeated and replicated, they will expose more school children to STEM and attract more students to transportation careers. "And one day, when I retire, I'll be happy to know that I had a hand in developing the workforce that replaces me," says Jasek.

Debbie Jasek's UTCM project has provided support to existing activities that expose children, teens and young adults to careers in science, technology, engineering and math as well as to careers in transportation.

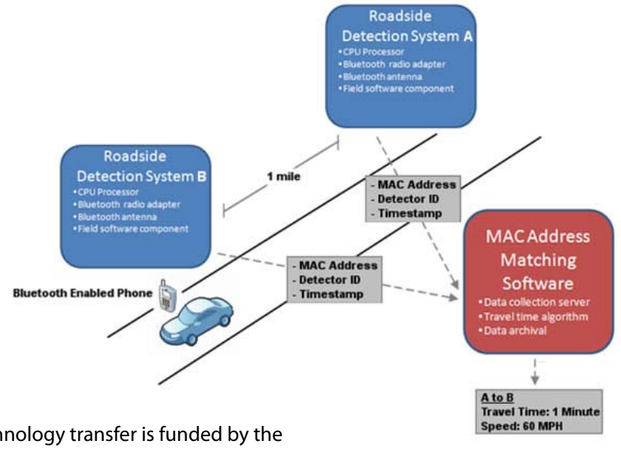
UTCM Technology Transfer: Commercialization

Bluetooth System Gathers Motorist Data at Low Cost with High Commercial Value

You may be familiar with Bluetooth® technology on your cell phone, which wirelessly connects to your headset and lets you talk hands-free. But Bluetooth can do more than just let you sip your coffee while you talk on the phone. It's a personal area network that connects devices to each other automatically when they're within range. That includes your cell phone, computer, car, mobile GPS unit – and soon, even your transportation network.

A recent UTCM study allowed researchers to elaborate on their initial concept of using Bluetooth to collect traffic data.

"Our initial investigation into using this technology to measure travel times indicated the method could be very successful, but we lacked the hardware necessary to make it work in an arterial environment," says Darryl Puckett, Texas Transportation Institute (TTI) research scientist. "The funding from UTCM allowed us to find a field-hardened, low-cost processor that performed well. We produced a working prototype for field deployment, and we saw positive results from implementing the Bluetooth system."



Transportation agencies use real-time information in traffic management and planning systems. The public uses it to plan trips and know about how long they'll take. However, current methods of gathering this information make it cost prohibitive to implement on every arterial and rural highway. The Bluetooth system is the low-cost answer to the problem.

How the Technology Works

Each Bluetooth device has a unique, anonymous identifier called a Media Access Control (MAC) address, which the device transmits within a short range. As a motorist with a Bluetooth-enabled cell phone passes a roadside sensor, the sensor reads the MAC address and forwards it, along with the time and location of the reading, to a central computer. Further down the road, another sensor reads the MAC address again, and the system matches the address – which contains no personally identifying information – to the first reading.

"In this way, the system gathers data and compiles it to get a complete picture of the different traffic speeds on segments of the roadway," says Puckett. "From there, it can calculate travel times."

Personal privacy is an important concern to the public, and Bluetooth technology ensures it. MAC addresses are anonymous – that is, they are not directly associated with a specific user and transmit no personal information. Only the specific identifier, its location and time of the collection are transmitted to the system. And users can disable the Bluetooth functionality of a device to prevent it from being read.

> ***"I see this technology as an exciting, innovative way to obtain traffic information in places where we would not otherwise be able to gather data because of the cost."***
>
> ***David Fink***
> ***Transportation Operations Engineer***
> ***Texas Department of Transportation***

Taking It to the Streets

The UTCM project has already produced results. Based on Puckett's successful demonstration, Houston's TranStar facility implemented the system as part of its transportation and emergency management services, planning to cover IH-45 from Houston to Dallas, more than 400 directional miles. According to TranStar, a single turnkey Bluetooth sensor installation costs $3,500, while the traditional installation averages 20 times that at $75,000.

"I see this technology as an exciting, innovative way to obtain traffic information in places where we would not otherwise be able to gather data because of the cost," says David Fink, a transportation operations engineer with the Texas Department of Transportation (TxDOT) at Houston TranStar.

TxDOT has also deployed the system to monitor hurricane evacuation routes. Researchers are also investigating using Bluetooth sensors at U.S.-Mexico border crossings to gather wait-time data. All are the result of UTCM's efforts to develop the original concept.

Moving to Commercialization

The Texas A&M University System keeps its intellectual property rights on the technology developed with UTCM funding. TTI has received a provisional patent on the Bluetooth system and applied for a utility patent this year. That means the A&M System was able to license the technology to a private-sector entity for commercialization. Royalties from the licensing will be returned to TTI and the A&M System.

"With key funding, UTCM has promoted valuable transportation research to the national and international transportation community," says Puckett. "We've gotten inquiries from a multitude of other states and countries. A lot of people are interested in this system."

This roadside equipment prototype was deployed in Dayton, Ohio to detect MAC addresses from Bluetooth devices in vehicles as they passed by.

Darryl Puckett
Research Scientist
Transit Mobility Program
Texas Transportation Institute - Houston

This technology transfer is funded by the following UTCM project:

Bluetooth®-Based Travel Time/ Speed Measuring Systems Development

#09-00-17
Darryl Puckett
06.01.09 - 05.31.10
Abstract: TRIS Online Accession #01173253

UTCM

Research Highlights

Dmitry Vedenov, PhD
Assistant Professor
Department of Agricultural Economics
Texas A&M University

Stephen Fuller, PhD
Professor
Department of Agricultural Economics
Texas A&M University

Gabriel Power, PhD
Assistant Professor
Department of Agricultural Economics
Texas A&M University

How Do Biofuels and Climate Change Affect Grain Transportation Patterns?

Corn has long been an American staple, but recent federal legislation has helped shift some of that corn from our dinner tables to our gas tanks. The federal mandate increases the use of ethanol and other renewable fuels in gasoline and diesel, replacing methyl tert-butyl ether (MTBE), which has unfavorable effects on health and the environment. Ethanol and other biofuels are made mostly from corn. Diverting a portion of the grain crop – a commodity second in ton-miles transported only to bituminous coal – from food use to fuel use has, and will continue to have, an important impact on transportation patterns in the United States.

A recent UTCM project takes a close look at the implications of this shift to biofuels for inland waterways and the shipping industry. Traditionally, grain has been transported along the Mississippi and Illinois Rivers from the upper Midwest to lower Mississippi River ports. With the shift of grain away from more congested portions of the waterways, transporters may use this opportunity to ship other commodities along these corridors, essentially filling the gap.

A change in climate could change agricultural production, imposing different demands on the transportation corridors. Dr. Vedenov's team includes Nobel laureate Dr. Bruce McCarl, who specializes in climate change.

"We've created a spatial equilibrium model to evaluate scenarios dealing with this shift in transport," says Dr. Stephen Fuller, Professor of Agricultural Economics at Texas A&M University, and a member of the UTCM research team headed by fellow agricultural economist Dr. Dmitry Vedenov. Says Vedenov, "We included more than 300 regions in the United States to estimate their available supplies as well as the transportation network of truck, rail and barge."

The model will help planners determine what infrastructure will be necessary in the years to come to mitigate traffic congestion. The future may hold opportunities for switching rail- and truck-transported commerce to the inland and intra-coastal waterways, reducing rail and highway congestion.

"This work is international in scope," says Fuller. "The model includes international travel connecting U.S. ports to foreign buyers, and also looks at foreign suppliers who compete with the United States as a supplier of grain. It will help us answer a variety of questions about the transportation infrastructure, traffic congestion, and international trade issues."

Vedenov's latest UTCM project also makes use of Fuller's international grain transportation logistics model, this time focusing on the effects of climate change on movement of agricultural products. With a change in climate, the location of agricultural production may also change, imposing different demands on the transportation corridors. Vedenov's team for this study includes Nobel laureate Dr. Bruce McCarl, a Texas A&M agricultural economist who specializes in climate change. Their model will give a picture of the current and future grain transportation network so that the United States can make the most of its planning efforts.

Results of the biofuels work will be published in late 2010, with the final report on the climate change work available mid-summer 2011.

Sharada Vadali, PhD
Associate Research Scientist
Economics, Trade and Logistics Program
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Bruce McCarl, PhD
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This research is funded by the following UTCM projects:

Effect of Climate Change Transportation Flows and Inland Waterways Due to Climate-Induced Shifts in Crop Production Patterns
UTCM Project #10-54-51
Dmitry Vedenov, Steve Fuller, Gabriel Power and Bruce McCarl
02.01.10 - 05.31.11
Abstract: TRB RiP #24804

Biofuels Energy Policy and Grain Transportation Flows: Implications for Inland Waterways and Short Sea Shipping
#08-15-14
Dmitry Vedenov, Sharada Vadali, Gabriel Power, Steve Fuller and Mark Burris
04.01.08 - 01.31.10
Abstract: TRB RiP #17079

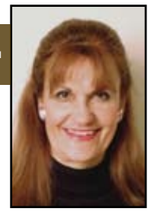
UTCM Research Highlights

Visualizing the Future in the Texas Urban Triangle

Michael Neuman, PhD, AICP

Associate Professor

Department of Landscape Architecture and Urban Planning
Texas A&M University



Elise Bright, PhD

Professor

Department of Landscape Architecture and Urban Planning
Texas A&M University

Curtis Morgan

Assistant Research Scientist and Program Manager

Multimodal Freight Transportation
Texas Transportation Institute

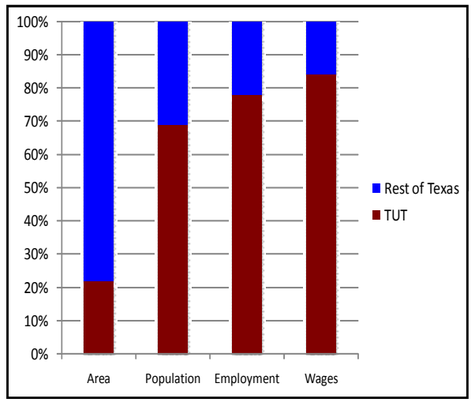
When roughly adjacent metropolitan areas grow and merge, they can form a megalopolis, like the one in the Boston–New York City–Washington, D.C., area. Four of Texas' major urban centers form a new urban phenomenon – the triangular megalopolis called the Texas Urban Triangle. San Antonio, Dallas-Fort Worth, Austin and Houston have the most population and economic growth in the state and often function as a single unit. Unlike other megalopolises, however, the Texas Urban Triangle is not contiguous or linear. That makes keeping the parts of the triangle working together through transportation, telecommunications and other infrastructures a challenge – and an opportunity.

> ***"The future of Texas is on the line. Texas is competing in a global marketplace. Places that are sustainable and have high-speed rail and other strategic approaches to moving people and goods are the ones that will be able to compete successfully."***
>
> ***Dr. Michael Neuman***
> ***UTCM Researcher***

"In order for the Texas Urban Triangle to stay competitive, we need to ensure that adequate infrastructure is in place to physically connect the urban centers," says Dr. Michael Neuman, an associate professor at Texas A&M University's College of Architecture. "But where will we put these new transportation links, and what kind of links are they? Are they highways, freight rail, high-speed rail?"

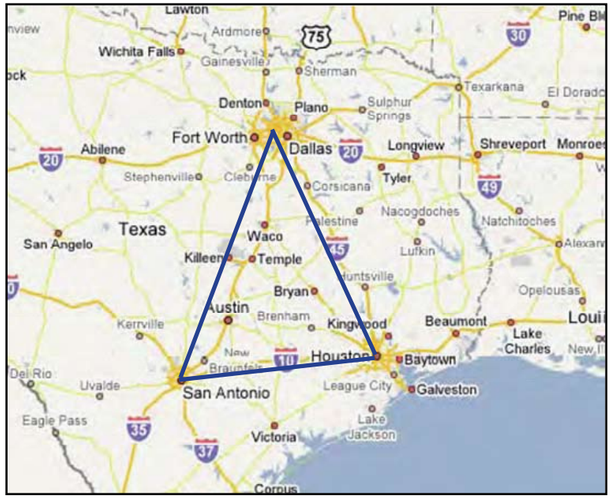
To help decision makers, such as local, metropolitan, and state

Texas Urban Triangle as a Proportion of Texas, 2007



(Source: United States Bureau of Census, 2008)

jurisdictions and authorities in Texas, Neuman is leading a research team to develop and test the Spatial Decision Support System (SDSS). The baseline data for the Texas Urban Triangle were previously compiled with the aid of funding from the Southwest Region University Transportation Center (SWUTC). In May 2010, with funding from the UTCM, the team completed development of the SDSS software. Currently, in a second project funded by the UTCM, the research team is testing this decision-making tool.



The Texas Urban Triangle is bound by Dallas/Ft. Worth, Austin, San Antonio and Houston, and the Interstates I-35, I-10 and I-45.

SDSS uses an Internet-based geographic information system to determine the best locations for new transportation infrastructure. The software maps multiple factors – infrastructural, demographic, environmental, agricultural, economic, hazard and land use – that affect decisions about where to locate transportation corridors. SDSS helps decision makers weigh these factors to make sustainable planning, policy and investment decisions for transportation. Jurisdictions and transportation authorities can test the impact of a new transportation corridor on urban growth and guide this growth in a sustainable manner, balancing the need for economic development with environmental protection and human health, safety and welfare.

Now in its second year, the UTCM project includes a pilot study currently underway at the county level to test SDSS. The proof of concept examines the Dallas-Fort Worth and San Antonio segment of the Interstate 35 corridor.

"The project maps the most and least suitable locations for transportation infrastructure," says Neuman. "SDSS uses more than 40 strategic economic, social and environmental factors in the model. We expect that the outputs of the model will be used by metropolitan planning organizations, the Texas Department of Transportation, metropolitan visioning groups, high-speed rail providers and similar entities." Results of the UTCM pilot study will be available early next year.

Neuman and his colleagues know the importance of their work. "The future of Texas is on the line," says Neuman. "Texas is competing in a global marketplace. Places that are sustainable and have high-speed rail and other strategic approaches to moving people and goods are the ones that will be able to compete successfully. Highways alone aren't enough; building more isn't the solution. Public transit, high-speed rail – we have to look at all the options and make the best decision based on the data."

This research is funded by the following UTCM projects:

Texas Urban Triangle: Creating a Spatial Decision Support System for Mobility Policy and Investments that Shape the Sustainable Growth of Texas

UTCM Project #09-30-10
Michael Neuman, Elise Bright and Curtis Morgan
02.01.09 - 05.31.10
Abstract: TRB RiP #20592

Texas Urban Triangle: Pilot Study to Implement a Spatial Decision Support System (SDSS) for Sustainable Mobility

UTCM Project #10-18-57
Michael Neuman, Douglas Wunneberger and Curtis Morgan
01.01.10 - 01.31.11
Abstract: TRB RiP #24831

UTCM RESEARCH HIGHLIGHTS

Vehicle-Routing Solutions for Paratransit and Rural Transportation

Swaroop Darbha, PhD

Professor

Department of Mechanical Engineering
Texas A&M University

Luca Quadrifoglio, PhD

Assistant Professor

Zachry Department of Civil Engineering
Texas A&M University

The vehicle-routing problem has long been a quandary for transportation agencies – given a fleet of vehicles, possibly starting from different depots, what is the most efficient way to get them to their destinations? Because the number of necessary calculations is vast, finding the optimal solution is computationally difficult, sometimes requiring supercomputers and a great deal of time. Small fleets, such as paratransit, rarely have those resources available to help them calculate optimal routes.

Researchers on a UTCM project are developing algorithms to find a vehicle-routing solution in less time and using less computing power. The project focuses on paratransit – flexible passenger transportation that does not follow fixed routes or schedules – especially in rural areas, where customer demands and distances traveled vary widely. The time needed to formulate a transportation plan is particularly important for paratransit. That's because their service areas are often large, so it takes more time to reach a passenger, which means less time to plan optimal routing.

"The problem is twofold," says Dr. Swaroop Darbha, Professor of Mechanical Engineering at Texas A&M University. "First, how do you route vehicles through locations where the customers are, so that the total cost is minimized? And second, how do you route them so that all customers are served in the minimum amount of time per vehicle?"

UTCM Researchers are developing an algorithm that will plan better routes in less time. That could translate to shorter waits for paratransit customers.

The approach Dr. Darbha and Dr. Luca Quadrifoglio, Assistant Professor of Civil Engineering at Texas A&M, have taken is to focus on creating acceptable suboptimal algorithms. These solutions can be derived quickly by computers in real time while still remaining acceptably close to the ideal solution.

"Without actually calculating the optimal solution, you can still calculate a lower bound for it," says Darbha. "The closer the suboptimal solution is to the lower bound, the better it is. Using our current algorithms, we can guarantee the quality of the proposed solution by determining its distance from the lower bound. Generally, the solution is not off by more than 15 to 20 percent."

Darbha and Quadrifoglio, together with three of their graduate students, have completed the algorithms for the basic routing problem and are currently focusing on the paratransit aspects of the research. But paratransit is only one of the possible applications.

"Routing algorithms have a vast number of applications, and the routing problem is found in almost every aspect of business," says Darbha. "The algorithms could be used for unmanned aerial vehicles, truck routing, and even scheduling computer processes. A lot of effort has been put into studying the basic routing problem, but there are a number of ways the solutions can be applied and much more that still needs to be studied."

The UTCM work will conclude in the summer of 2011, and results will be available in the fall of 2011.

This research is funded by the following UTCM project:

Multiple Depot Vehicle Routing with Applications to Paratransit and Rural Transportation

Swaroop Darbha • 09.01.09 - 08.31.11
Abstract: TRB RiP #20584 • UTCM Project #09-15-13

"The routing problem is found in almost every aspect of business. The algorithms could be used for unmanned aerial vehicles, truck routing, even scheduling computer processes. A lot of effort has been put into studying the basic routing problem, but there are a number of ways the solutions can be applied."

Dr. Swaroop Darbha
UTCM Researcher

UTCM New Research Projects

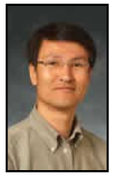
UTCM Project #10-09-60 • RiP.trb.org Database #24834

Development of a Short-Term Prediction Model for Commercial Vehicle Crossing Times

Rajat Rajbhandari, PhD, PE

Associate Research Engineer

Research and Implementation
Texas Transportation Institute - El Paso



Don Kang

Professor

Department of Landscape Architecture & Urban Planning
Texas A&M University

Project dates: November 1, 2009 - March 31, 2011
Award: $53,530

Border crossing time measurement systems for commercial vehicles are being implemented throughout the U.S.-Mexico and U.S.-Canada borders. Some of these systems are based on the Radio Frequency Indication (RFID) technology. A TTI/Battelle team previously installed an RFID-based system at the Bridge of the Americas (BOTA) in El Paso, Texas to measure and archive crossing times of commercial vehicles. These data are relayed and archived in a centralized repository. In addition, TTI deployed RFID systems on the Pharr-Reynosa International Bridge. These systems measure the current crossing time and provide the information to users. However, there are no systems in place at the U.S.-Mexico or U.S.-Canada borders to predict traffic conditions including crossing times of trucks. This project is developing such a system.

UTCM Project #10-01-54 • RiP.trb.org Database #24828

Best Practices and Outreach for Active Traffic Management

RESEARCH

Beverly Kuhn, PhD, PE

Division Head

System Management Division
Texas Transportation Institute

Project dates: January 1, 2010 - December 31, 2010
Award: $122,000

Continued increase in travel on congested freeway corridors and limited public funding for expansion and improvement projects are limiting agencies' abilities to provide sufficient roadway capacity in major metropolitan areas. Focusing on trip reliability, active traffic management (ATM) – widely deployed for decades in Europe but in its early stages in the US – maximizes the effectiveness and efficiency of the facility, and increases throughput and safety through integrated systems with new technology. This congestion management approach consists of a combination of operational strategies that, when implemented in concert, fully optimize the existing infrastructure and provide measurable benefits to the transportation network and the motoring public. These strategies include speed harmonization, temporary shoulder use, junction control, and dynamic signing and re-routing. By providing transportation agencies with crucial information on best practices for deployment and operation of these ATM strategies, this project can stimulate the following: increase in average throughput for congested periods and in overall capacity; a decrease in primary and secondary accidents and accident severity; an overall harmonization of speeds during congested periods; decreased headways and more uniform driver behavior; an increase in trip reliability; and the ability to delay the onset of freeway breakdown.

UTCM Project #10-65-55 • RiP.trb.org Database #24829

Real-Timing the 2010 Urban Mobility Report

Timothy Lomax, PhD, PE

Research Engineer

Mobility Analysis Program
Texas Transportation Institute

Project dates: January 1, 2010 - December 31, 2010
Award: $170,000

The Texas Transportation Institute is considered to be a national leader in providing congestion and mobility information. The Urban Mobility Report (UMR) is the most widely quoted report on urban congestion and the associated costs in the nation. The report measures system delay, wasted fuel and the annual cost of congestion in all U.S. urban areas. The data that are available to analyze the transportation performance are evolving, however, and the UMR procedures need to adopt the new data sources to provide the best possible estimate of mobility conditions. Private sector companies advertising the availability of nationwide average speed data on many highways in the U.S. compete with the UMR for congestion coverage. Partnering with one of the private sector speed companies, researchers are matching TTI and private sector databases and re-compiling the UMR statistics based on actual speed data for all days and all major urban roads. This research will improve the estimates of congestion, its costs, and will improve the timeliness of U.S. traffic congestion estimates.

RESEARCH

UTCM Project #10-18-57 • RiP.trb.org Database #24831

Texas Urban Triangle: Pilot Study to Implement a Spatial Decision Support System (SDSS) for Sustainable Mobility

Michael Neuman, PhD, AICP
Associate Professor
Department of Landscape Architecture and Urban Planning
Texas A&M University

Douglas Wunneburger
Professor
Department of Landscape Architecture and Urban Planning
Texas A&M University

Curtis Morgan
Assistant Research Scientist and Program Manager
Multimodal Freight Transportation
Texas Transportation Institute

See related article, p. 18

Project dates: January 1, 2010 - January 31, 2011
Award: $109,785

This project addresses sustainable transportation in the Texas Urban Triangle (TUT) by conducting a pilot project at the county scale. The pilot project/proof of concept tests the multi-attribute spatial development support system (SDSS) developed in 2009 under another UTCM project, in order to determine the most suitable locations for transportation infrastructure networks, including high speed rail. It selects a key county in the Dallas-Fort Worth – San Antonio segment of the I-35 corridor. The project will map, using the 40+ strategic economic, social, and environmental factors in the model, the most and least suitable locations for transportation infrastructure. It is expected that the outputs of the model will be used by TUT metropolitan planning organization's (MPO's), Texas Department of Transportation (TxDOT), metropolitan visioning groups, high speed rail providers, and similar entities.

UTCM Project #10-19-46 • RiP.trb.org Database #24799

Impacts of Funding and Allocation Changes on Rural Transit in Texas

Suzie Edrington
Research Specialist
System Planning, Policy and Environment Research Group
Texas Transportation Institute - Austin

Project dates: January 1, 2010 - February 28, 2011
Award: $65,000

Funding among Texas rural transportation districts has undergone rapid and significant change over the last five years. While the Federal Transit Administration committed to increased rural funding under SAFETEA-LU, TxDOT implemented a revised "needs plus performance" based method for distributing both federal and state rural funds among providers. The method resulted in a significant redistribution of funding among providers; some providers were programmed to lose half of their FY2004 funding level, while others were programmed for increases exceeding 300%. The 2010 national census will introduce another point of discontinuity in funding because population and land area, the two "needs" factors in the current funding allocation formula, will be assigned to either enlarging or emerging urbanized areas in several rural areas. Modification to the funding allocation formulae is almost certain at that point. This project will provide rural transit operators, TxDOT and elected officials with the results of the increased investment and redistribution of rural transit funds over the last five years. This information will be critical to consideration of future state funding levels and funding allocation formula changes.

UTCM Project #10-25-50 • RiP.trb.org Database #24803

Use of Performance Measurement to Include Air Quality and Energy into Mileage-Based User Fees

Mohamadreza Farzaneh, PhD, PE
Assistant Research Scientist
System Planning, Policy and Environment Research Group
Texas Transportation Institute

Richard T. Baker
Associate Transportation Researcher
System Planning, Policy and Environment Research Group
Texas Transportation Institute - Austin

Ginger Goodin, PE
Research Engineer
System Planning, Policy and Environment Research Group
Texas Transportation Institute - Austin

Project dates: January 1, 2010 - May 31, 2011
Award: $100,000

Vehicle mileage fees are one of the leading mechanisms being studied as a potential replacement for the fuel tax. Research entities such as the Transportation Research Board have endorsed them as the most promising solution to long term transportation funding concerns. Domestic pilots, such as Oregon's Mileage Fee Concept and Road User Pilot Program, have shown that they can be developed and implemented with a high degree of reliability and public acceptance. These types of fee systems, which would levy a fee on the miles driven, can be used to achieve multiple policy goals; however, as currently evaluated, fee structures incorporate a limited set of policy oriented factors. Pricing has been set to generate revenue and shift travel to off-peak periods, but not many other potential policy goals have been explored. For example, none of the completed or ongoing pilot studies have attempted to implement a pricing regime that incorporates environmental mitigation, minimizes the social equity impacts of transportation, or attempts to accurately capture and recover the cost of maintenance and operations. This research presents the first step toward a pricing framework based on the concept of performance measurement that systematically defines and incorporates potential air quality goals. Researchers are defining the interactive role of user fees and pricing in roadway transportation operations and identifying air quality performance measures for determining the appropriate vehicle mileage fee price. This framework will be invaluable in more effectively monitoring the air quality and greenhouse gas reduction and mitigation performance of vehicle mileage fee systems.

UTCM Project #10-60-59 • RiP.trb.org Database #24833

Evaluating the Use of Transfers for Improving Rural Public Transportation

Project dates: January 1, 2010 - May 31, 2011
Award: $80,000

Demand responsive transit (DRT) systems have flexible routes and schedules that can provide curb-to-curb/door-to-door services to better meet the needs of rural areas. However, rural DRT services are still extremely costly to operate. In this project we consider a variation of the regular demand responsive transit system which adopts the transfer practice to reduce operating costs. This practice has been adopted by some agencies with zoning rules for the whole service area or trips that need to cross jurisdictional districts; however, the pros and cons need to be carefully assessed. We evaluate the effect of different transfer operating policies by developing a simulation model of several plausible scenarios. Data from Houston METRO and other rural transit agencies across Texas are being used for testing. This study will provide decision makers and DRT agencies with information for innovative operating practices to improve the performance and cost efficiency of rural public transportation systems.

Luca Quadrifoglio, PhD
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Zachry Department of Civil Engineering
Texas A&M University

Suzie Edrington
Research Specialist
System Planning, Policy and Environment Research Group
Texas Transportation Institute - Austin

UTCM Project #10-44-53 • RiP.trb.org Database #24827

Examining Long-Distance Express Bus as an Extension of and Feeder to Passenger Rail Systems

Project dates: April 1, 2010 - January 31, 2011
Award: $82,000

One of the mobility challenges facing Texas and other high-population states in the coming years is rising travel demand along major intercity travel corridors. Passenger rail service may help to absorb some of the travel demand from crowded highway and air travel corridors, but it is cost prohibitive to develop over very long distances. This project explores the potential of using express intercity bus service as an alternative to and an extension of passenger rail service, providing a similar type of higher-speed, limited-stop service over long distances with a lower development cost than rail.

Laura Higgins
Associate Research Scientist
Center for Transportation Safety
Human Factors Group
Texas Transportation Institute

Curtis Morgan
Assistant Research Scientist and Program Manager
Multimodal Freight Transportation
Texas Transportation Institute

UTCM Project #10-54-51 • RiP.trb.org Database #24804

Effect of Climate Change Transportation Flows and Inland Waterways Due to Climate-Induced Shifts in Crop Production Patterns

Project dates: February 1, 2010 - May 31, 2011
Award: $95,000

This project analyzes the demand for transportation capacity and changes in transportation flows on inland waterways due to shifts in crop production patterns induced by climate change. Shifts in the crop production mix have been observed in recent years in response to changing climate. The primary exhibited trend is that of a northward shift resulting, for example, in increased corn production in historical wheat producing regions. Given differences in the typical destinations and volumes of corn and wheat shipments, such changes have the potential to alter the pattern, composition and seasonality of grain flows toward and along the Mississippi River. As a result, bulk cargo traffic patterns, transportation flows, and demand for transportation capacity and facilities in the Mississippi River Basin may change dramatically in the near future. The project is analyzing these changes using a U.S. agricultural sector model and an international grain transportation model. The former predicts shifts in production patterns due to climate change, while the latter analyzes the effect of predicted production shifts on transportation flows. The results will help planners in forecasting demand for Mississippi River transport facilities and capacity.

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Stephen Fuller, PhD
Professor
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Gabriel Power, PhD
Assistant Professor
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Texas A&M University

Bruce McCarl, PhD
Distinguished Professor and Regents Professor
Department of Agricultural Economics
Texas A&M University

See related article, p. 16

UTCM Project #10-15-47 • RiP.trb.org Database #24800

Teen Driver Cell Phone Blocker

Project dates: January 1, 2010 - December 31, 2011
Award: $105,500

The goal of this study is to reduce distraction-related negative driving events among teens. The project measures the effectiveness of a cellular phone control device that communicates with the vehicles of teen drivers to deny them access to their phone while driving. Investigators manufactured and distributed 100 patent-pending cell phone disabling devices developed at the Texas A&M Health Science Center to newly-licensed teen drivers. Two hundred study participants are equally divided between urban and rural areas (Houston and Brenham, TX, respectively), and teens with and without the disabling device. Pre- and post-surveys are being conducted of teens and their parents. Vehicle, crash and moving violation qualitative data are being collected and analyzed using statistical software. Post-surveys of parents and teens are being taken at inception, 6 months and 1 year after a teen receives a driver license and has entered the study. Surveys inquire about teen involvement in traffic crashes, awareness of the impact of cell phone use on driving performance, attitudes toward the device, usability and quality issues, as well as marketability of the device. Teen driver habits and the impact of parent and professional training are also being analyzed.

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Texas A&M Health Science Center
Department of Environmental and Occupational Health
Texas A&M University

Rainer Fink, PhD
Associate Professor
Department of Engineering Technology and Industrial Distribution
Texas A&M University

UTCM New Education Project

UTCM Project #10-22-49 • RiP.trb.org Database #24802

A New Graduate Course in Transportation Infrastructure Finance in the Civil Engineering Department at Texas A&M University

Project dates: January 1, 2010 - December 31, 2010
Award: $60,000

Over the course of the next several years, it is expected that the highway trust fund will deteriorate rapidly. This situation leaves many state agencies in a position to look for alternate forms of financing projects. One possible solution is to partner with the private sector and deliver facilities utilizing project finance methods. It is only recently that project finance has found new applications in delivering transportation infrastructure. This trend is likely to increase in the near future. However, since it is has been widely adopted in other infrastructure sectors, mainly for delivering power plants, major pipelines, etc., there are many valuable cases and lessons learned that can be brought to the transportation arena. Nevertheless, few programs in the country have a project finance course integrated as part of the core curriculum for graduate civil engineering students. Even fewer treat project finance as a truly interdisciplinary topic. In fact, the topic of project finance often constitutes only a small part of the structured finance curricula, itself a fraction of the courses in finance taught by U.S. business schools. This project will bridge this gap by developing educational and teaching materials for an interdisciplinary course in project finance. This course will communicate the implications of financial decisions on engineering choices and vice versa. The course is aimed at students at the Masters level.

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Sharada Vadali
Associate Research Scientist
Economics, Trade, and Logistics Program
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Erin McTigue
Assistant Professor
Department of Teaching, Learning and Culture
Texas A&M University

UTCM New Technology Transfer Projects

UTCM Project #10-20-58 • RiP.trb.org Database #24832

Transportation Plan Repository and Archive

Project dates: January 1, 2010 - December 31, 2010
Award: $45,000

This project establishes a repository and archive for transportation planning documents in Texas within the existingTexas A&M Repository (http://digital.library.tamu.edu). Researchers are developing a process for collecting transportation plans from metropolitan and rural planning organizations, creating repository records, and uploading the documents. A consistent set of metadata including agency name and topic is being created. The project leverages the underlying database and search interface that are part of the Texas A&M Repository and takes advantage of the Repository's servers, storage, and commitment to maintain the files permanently. The archive will provide ready access to transportation plans to planners, researchers, policy makers, and the public for planning, research, and other uses. International standards used by the Repository and cooperative arrangements among similar repositories will make records readily accessible through Google and other search engines. Continued application of the processes developed through the project will allow the collection to grow over time.

John Overman
Associate Research Scientist
Department of System Planning, Policy and Environment Research Group
Texas Transportation Institute

Sandra Tucker
Associate Professor
University Libraries
Texas A&M University

UTCM Project #10-10-52 • RiP.trb.org Database #24826

Activating Teens to Prevent Traffic Crashes, the Leading Cause of Death and Injury for America's Youth

Project dates: January 1, 2010 - May 31, 2011
Award: $38,497

Car crashes kill more young people each year than any other cause. In addition to law enforcement and driver education, efforts to improve safety for this age group over the years have included public education and outreach programs, but these programs have suffered from two notable shortcomings. First, they have tended to focus exclusively on drunk driving, largely overlooking dangers that are actually more common to teenage drivers, such as nighttime driving and distractions (mainly cell phones/texting and other teen passengers). Second, the programs have typically been developed by adults with little or no involvement by the target audience, thereby compromising their potential effectiveness. Teens in the Driver Seat (TDS) is a growing program that addresses each of these issues by focusing on common dangers and by involving teens in both the development and delivery of safety messages. This essential teen involvement takes many forms, one of the most important of which is the TDS Teen Advisory Board, a representative group of teens from across Texas who offer ongoing guidance and feedback to TTI staff who are responsible for the TDS program. This project enhances the substance and value of this teen feedback by bringing the board's members together once each quarter for extensive, interactive involvement in the ongoing refinement and growth of the TDS program. Since the launch of TDS in 2003, the frequency and rate of teen drivers involved in fatal crashes has fallen faster and more steadily than in any other state, a distinction due in part to how TDS augments and supports the state's graduated driver license (GDL) law. Increased teen involvement in the further development and refinement of TDS will help to ensure continued success of the program.

Russell Henk, PE
Division Head, Program Manager & Senior Research Engineer
Research and Implementation Division
Texas Transportation Institute
- San Antonio, El Paso

UTCM Project #10-55-48• RiP.trb.org Database #24801

Transit Management Certificate Program

Project dates: January 1, 2010 - May 31, 2011
Award: $75,000

A successful Transit Management Certificate Program can provide leadership training for the current generation of public transportation managers in rural and small urban areas in Texas and also provide needed academic preparation to attract career professionals into the industry in the future. This project is accomplishing the following tasks: (1) Review national transit certificate programs to identify best practices and lessons learned. (2) Consult experts at Texas A&M, the TxDOT Public Transportation Division and transit agency representatives to gain academic and industry perspectives. (3) Develop the Transit Management Certificate Program. (4) Gain approval by all appropriate entities. (5) Deliver the first offerings for the Transit Management Certificate Program. (6) Determine opportunities to expand the certificate program to other Texas institutions to increase access for rural and small urban transit.

Linda Cherrington
Program Manager and Research Scientist
Transit Mobility Program
Texas Transportation Institute- Houston

Ben Welch
Assistant Dean for Executive Education & Clinical Professor
Department of Management
Texas A&M University

UTCM Project #10-02-56 • RiP.trb.org Database #24830

Graduate Certificate Program in Transportation Planning: Phase 2

Forster Ndubisi, PhD, ASLA

Professor and Head

Department of Landscape Architecture and Urban Planning
Texas A&M University

Eric Dumbaugh

Assistant Professor

Department of Landscape Architecture & Urban Planning
Texas A&M University

Project dates: April 1, 2010 - January 31, 2011
Award: $58,000

This project extends the delivery of the recently developed graduate certificate in transportation planning to a wider audience through the establishment of an Executive Certificate Program. While the need for an interdisciplinary approach to transportation is widely recognized by the professional community, there are few educational programs that address the field of transportation in a truly comprehensive, interdisciplinary manner. The Texas A&M University-wide graduate certificate in transportation planning was established in August 2008 to address this need. This program has proved to be very successful. A limitation of the existing certificate program is that it is available only to graduate students at Texas A&M University in College Station. An Executive Certificate Program will extend the delivery of the existing certificate to a wider audience of professionals interested in transportation in selected metropolitan areas in Texas. Preliminary indications suggest that an audience for the certificate exists in major metropolitan areas in Texas, especially Austin, Dallas, Houston, and San Antonio. The Certificate will increase access, expand Texas A&M's transportation curriculum, and enhance the University's position as a national leader in transportation education.

UTCM Project #10-00-61 • RiP.trb.org Database #26613

Development of a Mileage-based User Fee Research Website

Richard "Trey" Baker

Associate Transportation Researcher

Department of System Planning, Policy and Environment Research Group
Texas Transportation Institute - Austin

Project dates: July 1, 2010 - October 31, 2010
Award: $3,556

As part of previous UTCM-funded research, a website was developed to support the planning for the first ever Symposium on Mileage-based User Fees (MBUF). The website has become a resource for ongoing research in the field of MBUF. Recently completed studies on MBUF are posted to the website and major media coverage of the topic is linked as well. This project further develops the website for individuals interested in exploring MBUF or professionals looking to keep track of the latest developments in the field. Updates to ongoing MBUF research pilot studies and research are being provided along with journal articles, media coverage, and various commentaries on MBUF. Interested parties may join a mailing list that will provide weekly updates on the subject.

UTCM Ongoing Projects

Research

Improving Intermodal Connectivity in Rural Areas to Enhance Transportation Efficiency and Reduce Metro/Port/Border Congestion: A Case Study

Research Team: Stephen Fuller, PhD, John Robinson, PhD and John Park, PhD, Department of Agricultural Economics, Texas A&M University
Project dates: September 1, 2007 - September 30, 2010 • **Award:** $60,000
UTCM Project #07-07 • RiP.trb.org Database #14288

Statistical Analysis of Waterway Network Congestion: Causes and Costs

Research Team: Ximing Wu, PhD and Stephen Fuller, PhD, Department of Agricultural Economics, Texas A&M University
Project dates: March 1, 2009 - August 31, 2011 • **Award:** $79,656
UTCM Project #09-16-14 • RiP.trb.org Database #20595

Leveraging Land Development Returns to Finance Transportation Infrastructure Improvements

Research Team: Jesse Saginor, PhD, ASLA and Eric Dumbaugh, PhD, Department of Landscape Architecture and Urban Planning, Texas A&M University
David Ellis, PhD, Mobility Analysis Program, Texas Transportation Institute
Project dates: June 1, 2009 - January 31, 2011 • **Award:** $100,000
UTCM Project #09-13-12 • RiP.trb.org Database #20594

The Impact of Gas Prices on Toll Road Use

Researcher: Mark Burris, PhD, Zachry Department of Civil Engineering, Texas A&M University
Project dates: September 1, 2009 - May 31, 2011 • **Award:** $58,158
UTCM Project #09-01-03 • RiP.trb.org Database #20581

Estimating the Value of Freight Delays in the Freight System

Researcher: Bruce Wang, PhD, Zachry Department of Civil Engineering, Texas A&M University
Project dates: September 1, 2009 - January 31, 2011 • **Award:** $3,856*
UTCM Project #09-00-45 • RiP.trb.org Database #23692
** This project receives additional funding through a UTCM Fellowship in the amount of $43,577.*

Developing Performance Measures for Sustainable Freight Movement

Research Team: **Joe Zietsman, PhD, PE**, Department of Agricultural Economics, Texas A&M University
Mohamadreza Farzaneh, Air Quality Studies Program, Texas Transportation Institute - Austin

Project dates: September 1, 2009 - February 28, 2011 • **Award:** $80,000

UTCM Project #09-37-15 • RiP.trb.org Database #20596

Multiple Depot Vehicle Routing with Applications to Paratransit and Rural Transportation

Research Team: **Swaroop Darbha, PhD**, Department of Mechanical Engineering, Texas A&M University
Luca Quadrifoglio, PhD, Zachry Department of Civil Engineering, Texas A&M University

See related article, p. 20

Project dates: September 1, 2009 - August 31, 2011 • **Award:** $80,000

UTCM Project #09-15-13 • RiP.trb.org Database #20584

Technology Transfer

Promoting Workforce Development for the Transportation Profession Through a Multi-University/Agency Partnership

Research Team: **Raghava Kommalapati, PhD, PE and Judy Perkins, PhD,** Department of Civil and Environmental Engineering, Prairie View A&M University
Debbie Jasek, Center for Professional Development, Texas Transportation Institute
Bill Stockton, PhD, PE, Executive Associate Agency Director, Texas Transportation Institute
Robert Benz, Research and Implementation, Texas Transportation Institute - Dallas

See related article, p. 10

Project dates: May 1, 2008 - September 30, 2010 • **Award:** $118,029

UTCM Project #08-45-07 • RiP.trb.org Database #15602

The Transportation Economy: Past & Future

Research Team: **Richard Cole and David Dennis,** TTI Communications, Texas Transportation Institute

Project dates: January 1, 2009 - October 31, 2010 • **Award:** $50,000

UTCM Project #09-27-05 • RiP.trb.org Database #20583

Facilitating Outreach Programs for Minority Students in Rural South Texas

Researcher: **Debbie Jasek,** Center for Professional Development, Texas Transportation Institute

See related article, p. 12

Project dates: January 1, 2009 - December 31, 2010 • **Award:** $29,000

UTCM Project #09-10-08 • RiP.trb.org Database #20589

UTCM Projects Completed in FY 10

Research

Transportation Planning, Policy & Climate Change: Making the Long Term Connection

Research Team: **Eric Lindquist, PhD and Arnie Vedlitz, PhD,** Bush School of Government & Public Service, Texas A&M University

Project dates: September 1, 2007 - February 28, 2010 • **Award:** $50,000

UTCM Project #07-03 • RiP.trb.org Database #14396

Methodology and Guidelines for Regulating Traffic Flows Under Air Quality Constraints in Metropolitan Areas

Research Team: **Yunlong Zhang, PhD and Qi Ying, PhD**, Zachry Department of Civil Engineering, Texas A&M University

Project dates: January 1, 2008 - December 31, 2009 • **Award:** $76,756

UTCM Project #08-35-17 • TRIS Online Accession #01164068

Estimating the Benefits of Managed Lanes

Research Team: **Mark Burris, PhD**, Zachry Department of Civil Engineering, Texas A&M University
Douglass Shaw, PhD, Department of Agricultural Economics, Texas A&M University

Project dates: January 1, 2008 - January 31, 2010 • **Award:** $80,000

UTCM Project #08-05-04 • TRIS Online Accession #01141697

Biofuels Energy Policy and Grain Transportation Flows: Implications for Inland Waterways and Short Sea Shipping

Research Team: **Dmitry Vedenov, PhD**, Department of Agricultural Economics, Texas A&M University
Sharada Vadali, PhD, Economics, Trade and Logistics Program, Texas Transportation Institute
Gabriel Power, PhD and Stephen Fuller, PhD, Department of Agricultural Economics, Texas A&M University
Mark Burris, PhD, Zachry Department of Civil Engineering, Texas A&M University

See related article, p. 16

Project dates: April 1, 2008 - January 31, 2010 • **Award:** $70,773

UTCM Project #08-15-14 • RiP.trb.org Database #17079

Examining Challenges, Opportunities and Best Practices for Addressing Rural Mobility and Economic Development under SAFETEA-LU's Coordinated Planning and Human Services Framework

Research Team: **June Martin, Cecelia Giusti, PhD and Eric Dumbaugh, PhD**, Department of Landscape Architecture and Urban Planning, Texas A&M University
Linda Cherrington, System Planning, Policy and Environment Research Group, TTI - Houston

Project dates: May 1, 2008 - February 28, 2010 • **Award:** $93,295

UTCM Project #08-17-09 • RiP.trb.org Database #15600

Valuation of Buyout Options in Comprehensive Development Agreements

Research Team: **Gabriel Power, PhD**, Department of Agricultural Economics, Texas A&M University
Mark Burris, PhD, Zachry Department of Civil Engineering, Texas A&M University
Sharada Vadali, PhD, Economics, Trade and Logistics Program, Texas Transportation Institute
Dmitry Vedenov, PhD, Department of Agricultural Economics, Texas A&M University

Project dates: September 1, 2008 - October 31, 2009 • **Award:** $85,272

UTCM Project #08-04-12 • TRIS Online Accession # 01150716

Developing a Methodological Framework to Value Public Sector Risk Exposure in PPP Agreements

Research Team: **Rafael Aldrete-Sanchez, PhD, PE**, Research and Implementation, Texas Transportation Institute - El Paso
Ivan Damnjanovic, PhD, Zachry Department of Civil Engineering, Texas A&M University

Project dates: September 1, 2008 - August 31, 2010 • **Award:** $99,979

UTCM Project #08-41-01 • RiP.trb.org Database #15603

Improving Mobility Information with Better Data and Estimation Procedures

Researcher: **Timothy J. Lomax, PhD, PE**, Mobility Analysis Program, Texas Transportation Institute

Project dates: January 1, 2009 - December 31, 2009 • **Award:** $150,000

UTCM Project #09-17-09 • TRIS Online Accession #01164063

Investigating the Effect of Freeway Congestion Thresholds on Decision-Making Inputs

Research Team: **Teresa Qu**, Mobility Analysis Program, Texas Transportation Institute

Project dates: January 1, 2009 - December 31, 2009 • **Award:** $40,000

UTCM Project #09-12-11 • TRIS Online Accession #01164061

PROJECTS

Texas Urban Triangle: Creating a Spatial Decision Support System for Mobility Policy and Investments that Shape the Sustainable Growth of Texas

Research Team: **Michael Neuman, PhD, AICP and Elise Bright, PhD, AICP**, Department of Landscape Architecture and Urban Planning, Texas A&M University
Curtis Morgan, Multimodal Freight Transportation Program, Texas Transportation Institute

See related article, p. 18

Project dates: February 1, 2009 - May 31, 2010 • **Award:** $100,000

UTCM Project #09-30-10 • RiP.trb.org Database #20592

Bluetooth-Based Travel Time/Speed Measuring Systems Development

Research Team: **Darryl Puckett**, Transit Mobility Program, Texas Transportation Institute

Project dates: June 1, 2009 - May 31, 2010 • **Award:** $73,499

UTCM Project #09-00-17 • TRIS Online Accession #01173253

See related article, p. 14

EDUCATION

Making Mobility Improvements a Community Asset

Research Team: **Brian Bochner, PE and Beverly Storey**, System Planning, Policy and Environment Research Group, Texas Transportation Institute
Dominique Lord PhD, PE, Zachry Department of Civil Engineering, Texas A&M University
Eric Dumbaugh, PhD, Department of Landscape Architecture and Urban Planning, Texas A&M University

Project dates: January 1, 2008 - November 30, 2009 • **Award:** $154,629

UTCM Project #08-14-03 • RiP.trb.org Database #15569

Developing an Interdisciplinary Certificate Program in Transportation Planning

Research Team: **Forster Ndubisi, PhD, ASLA and Eric Dumbaugh, PhD**, Department of Landscape Architecture and Urban Planning, Texas A&M University

Project dates: January 1, 2008 - January 31, 2010 • **Award:** $101,824

UTCM Project #08-21-10 • RiP.trb.org Database #15568

TECHNOLOGY TRANSFER

Freeway Bottleneck Removals: Workshop Enhancement and Technology Transfer

Research Team: **Carol Walters, PE, Poonam Wiles and Scott Cooner**, System Planning, Policy and Environment Research Group, Texas Transportation Institute - Arlington

Project dates: September 1, 2008 - October 31, 2009 • **Award:** $78,000

UTCM Project #08-37-16 • TRIS Online Accession #01150731

Development of an Enhanced Toll Project Screening Model

Researcher: **Curtis Beaty**, Research and Implementation, Texas Transportation Institute - Dallas

Project dates: January 1, 2009 - September 30, 2009 • **Award:** $65,364

UTCM Project #09-22-02 • RiP.trb.org Database #20579

PROJECTS

Facilitating Creation of Rural Transit System Technology User Groups

Researcher: **Jeffrey Arndt**, Transit Mobility Program, Texas Transportation Institute - Houston

Project dates: January 1, 2009 - August 31, 2010 • **Award:** $36,000

UTCM Project #09-07-01 • RiP.trb.org Database #20456

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Associate Vice Chancellor for Engineering and Executive Associate Dean, Dwight Look College of Engineering, Texas A&M University

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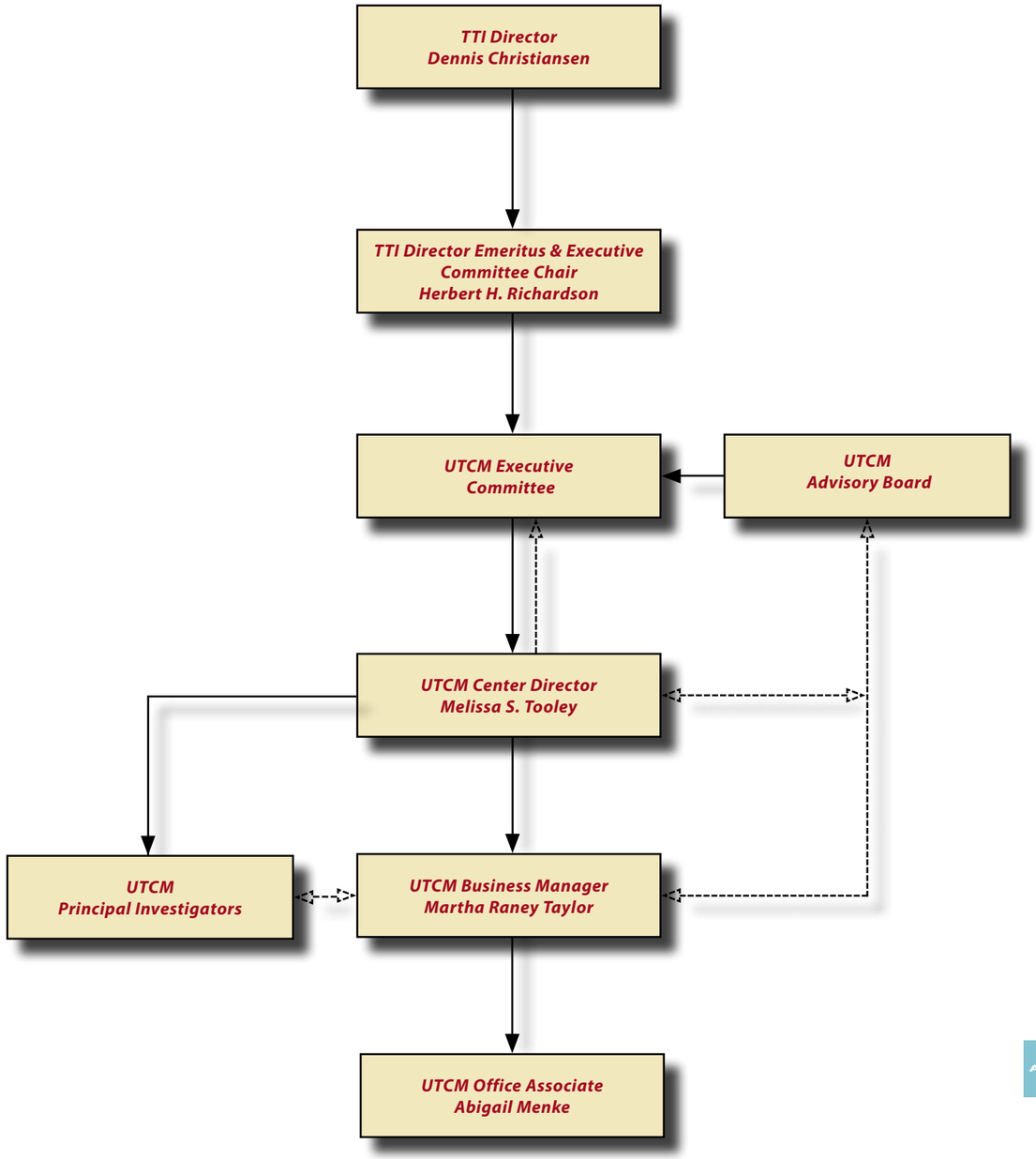
UTCM Organizational Chart



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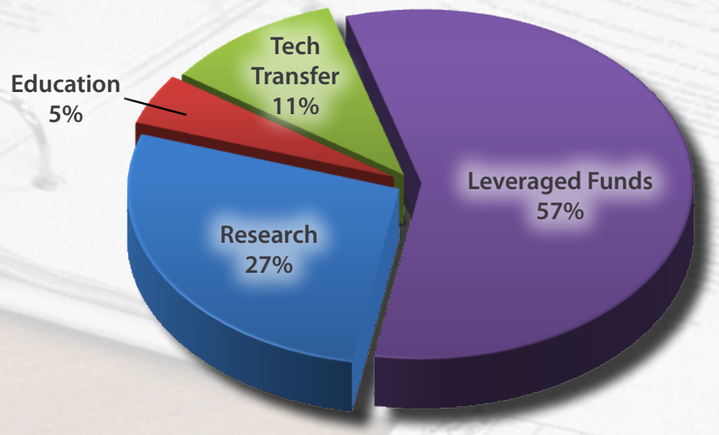
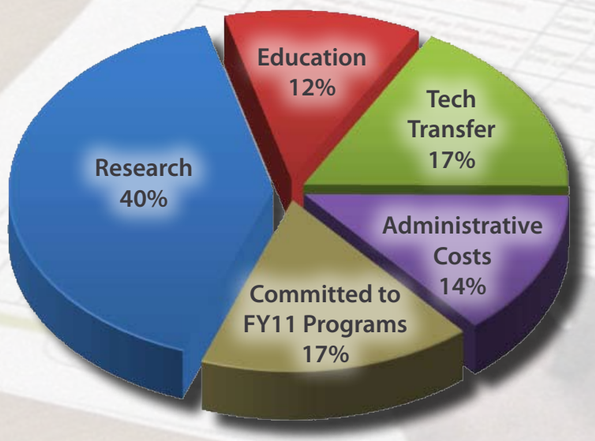
UTCM Financial Report

FY10 Project Funds



FY10 Federal Funds



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