

# SWUTC News

Texas A&M University • University of Texas at Austin • Texas Southern University

## SWUTC/UTCM Hosts Federal Site Visit

On March 4th, visitors from Research and Innovative Technology Administration (RITA) conducted a one-day combined site visit of the Southwest Region University Transportation Center and the newly established University Transportation Center for Mobility on the Texas A&M University Campus. Members from both center Executive Committees and key researchers were present to welcome Robin Kline, Amy Stearns and Tom Marchessault to the campus and make presentations showcasing their UTC activities.



(L to R) Dr. Amit Bhasin demonstrates testing equipment in the TTI Materials Lab to RITA visitors Amy Stearns, Robin Kline and Tom Marchessault

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## Mark Your Calendar

### Biofuels Workshop - Texas Transportation Goes Green

Where: Texas Southern University

When: October 31, 2008

This one day workshop will bring together key individuals in the transportation and biofuels industry. The focus will be for industry insiders to come together in a common forum and discuss the issues facing Texans and the U.S. as a whole. The issues include the production of bio and alternative fuels and most importantly the marketing of these alternatives. Along with the workshop will be an Alternative Fuel Source demonstration for workshop participants which will include:

Run Your Car on Water  
Hydroxy Vehicle Demonstration and Retrofit  
Vegetable Oil for Fuel? Vehicle Demonstration and Retrofit  
Electric Vehicle Display and Information  
Hybrid Vehicle Display and Information

For additional workshop information - please contact:  
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## Key SWUTC Personnel Recognized with Honors

On February 21st, **Dr. Kara Kockelman**, SWUTC researcher and associate professor of civil engineering at the University of Texas at Austin, received the *Woman of the Year Award* from the Heart of Texas Chapter of the Women's Transportation Seminar.

This award honors a leader in the field of transportation who has advanced the reputation and credibility of women in the field. Dr. Kockelman's primary research interests include the modeling of urban systems, the economic impacts of transportation policy, and crash occurrence and consequences.

On April 4, **Dr. Carol Lewis** SWUTC Executive Committee member and researcher at Texas Southern University was named *Woman of the Year* by the Houston Chapter of the Women's Transportation Seminar at its annual scholarship dinner at the Hyatt Regency Hotel in Houston. This award is designed to honor a woman who is an outstanding role model in transportation and has made a significant contribution to the transportation industry while directly contributing toward the advancement of women and minorities through programs or opportunities in the transportation field.

## In Memoriam

Transportation professionals in Texas and across the country are reflecting on the lifetime achievements and visionary guidance of G. Sadler Bridges, who died April 16. Bridges' career spanned five decades and included a pioneering transportation appointment with the Texas governor's office, accolades from a U. S. vice president and debts of gratitude from numerous colleagues whose careers he helped inspire.

Bridges was first hired by TTI in 1967 after receiving degrees in business administration and economics at the A&M College of Texas. Bridges also pursued doctoral studies in economics at Southern Methodist University. He was an assistant professor of economics at Texas A&M before he began his 40-year career at TTI.

Bridges was one of the original members of the CUTC-based working group that developed the UTC program in the late 1980's. He served for almost 20 years on the SWUTC Executive Committee and was a unifying force in building the successful consortium (Texas A&M System, Texas Southern University, and the University of Texas at Austin) comprising the SWUTC.

**Dr. Randy B. Machemehl** SWUTC Associate Director for Research at the University of Texas at Austin and key researcher has been selected by the Transportation and Development Institute to received the *2008 Wilbur S. Smith Award*. The award citation reads: "For his contributions to transportation engineering as a teacher, researcher and research administrator. His impact upon the profession is reflected in the wealth of "human capital" that he created in the form of graduate civil engineers who populate our industry." In selecting him for this award, the committee particularly noted his industry-wide impact on transportation engineering.

**Dr. Chandra Bhat**, SWUTC researcher and professor of civil engineering at the University of Texas at Austin, received the Wilbur S. Smith *Distinguished Transportation Educator Award* from the Institute of Transportation Engineers for his "outstanding contribution to the transportation profession by relating academic studies to the actual practice of transportation". Bhat is the Adnan Abou-Ayyash Centennial Professor in Transportation Engineering.



## Distance Learning Graduate Certificate Program Moves to Penn St.

For the past two and a half years, the Distance Learning Graduate Certificate Program (DLGCP) business office functions have been housed within the SWUTC/TTI. In April, Penn State University, with the awarding of the FHWA grant to further develop the DLGCP, became the new home for the program. The SWUTC would like to thank the following regional UTCs for their support and financial contributions in seeing this important endeavor off the ground.

University of Washington  
Iowa State University  
North Dakota State University  
City College of New York  
Pennsylvania State University

University of Tennessee  
Purdue University  
University of Nebraska  
Texas A&M University

## New Research Highlights

*This year, the SWUTC selected 36 new research studies to fund.  
A few of these are highlighted below.*

### Bioenergy

This year, the SWUTC initiated a scoping study to examine the impact of bioenergy and alternative fuels on the region 6 economy and transportation infrastructure.

The United States will need alternative fuels to meet its future energy needs, and President Bush's energy plan for reducing gasoline consumption calls for facilitating the growth of renewable and alternative fuel sources (including corn ethanol, cellulosic ethanol, biodiesel, methanol, butanol, and hydrogen) by increasing the size and expanding the scope of the current renewable fuel standard (RFS). The RFS, established in the Energy Policy Act of 2005 has spurred significant ongoing technological advances and has made possible the increase and expansion of the standard to displace even larger volumes of gasoline. In terms of the President's proposed plan, the fuel standard will be set at 35 billion gallons of renewable and alternative fuels by 2017.

Corn-based ethanol is more expensive and less efficient than sugarcane-based ethanol. The close access of Texas and Louisiana to the Gulf of Mexico may make it more attractive to import alternative fuels rather than to transport the more costly corn-based ethanol from their Midwest centers of production to Southwest markets.

This study supervised by **Dr. Leigh Boske** at the University of Texas at Austin, is examining the relative future availability of alternative fuel supplies in Region 6, likely bio fuel transport corridors, production capacity, and their economic, environmental, and ecological impacts within the region.

### Technology

It is expected that over the next few years that Radio Frequency Identification (RFID) technology use in transportation operations and logistics will see a rapid growth in application. Under the RFID equipped vehicle and highway system, almost all components (vehicles, highways, traffic signals, sign, symbols, pavement markers, etc.) can be provided with the long-lasting and cheap RFID tags or labels. The RFID system typically includes an RFID device con-

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taining data, an antenna transmitting signals, a Radio Frequency (RF) transceiver generating signals, and a reader receiving RF transmissions. Potential applications in transportation include: intersection and highway signal control; Vehicle Infrastructure Integration (VII) systems; Automatic Vehicle Identification (AVI); mobile report and incident detection; corridor management; dynamic route choice; and pre-trip route choice and route guidance systems to name a few. In addition, RFID technologies can be easily incorporated into almost all aspects of the Intelligent Transportation Systems.

This research underway by **Dr. Fengxiang Qiao** of Texas Southern University, has the objectives to investigate the potential applications of RFID in transportation operations; to identify the most applicable model and types of tags and receivers that are possible to use in transportation operations; and to identify the impact of the application of RFID to existing ITS architecture and its subsystems.

## Mobility

### Two Possible Solutions to One Very Big Problem

This past year, the SWUTC funded two research studies focusing on the rural, sprawled communities along the Texas Mexico border called *colonias*. An estimated 500,000 Texas residents, most of whom are legal citizens of the United States, currently live under poor conditions in these communities. They are challenged daily with the simple tasks of seeing their children off to school, going to work, obtaining water for daily use, buying groceries, obtaining quality health care, and having their trash removed. The *colonia* communities have numerous problems, but one that transcends most other issues is the lack of reliable, safe and affordable transportation, both public and private.

The first research effort, conducted by **Dr. Luca Quadrifoglio** at Texas A&M University “Transit Services for Sprawling Areas with Relatively Low Demand Density: A Pilot Study in the Texas Border’s *Colonias*” examines the feasibility and potential future implementation of flexible transit solutions in the *colonias*. One of the major challenges that service providers are facing in those areas is the relatively low demand density, which does not facilitate a cost effective development of traditional fixed route transit services. Recently, innovative and flexible concepts in transit have been analyzed by researchers and practitioners to respond to the transportation needs of relatively low density areas; however, these systems have very seldom been implemented. The efficiency of these flexible systems is very sensitive to how well they are able to respond to the demand. A well designed system is one that is able to anticipate, react and adapt to the demand fluctuations as quickly and efficiently as possible. Thus, a necessary condition to maximize the efficiency of these transit systems is a proper understanding of the demand patterns and distributions (location wise and time wise) of the considered service area. The demand is in general very difficult to estimate; however, its proper assessment is crucial. The objective of this study is to conduct a pilot study in selected communities on the Texas border to collect demand data and assess the appropriateness and feasibility of flexible transit for these areas.

The second study, conducted by **Ms. Beverly Story** at Texas A&M University, “Transportation for Humanity: Meeting the Needs in the *Colonias*” focuses on providing personal or private vehicles instead of public transportation. There are three key components of this research effort: a feasibility study for vehicle procurement through donations or at-cost purchases from a variety of entities and/or individuals to support the program, development of a qualification and selection criteria structure and implementation process for distribution of vehicles to residents, and determination of an equitable payment for the vehicle.

Flexible transit or personal vehicles? Two very different approaches to a possible solution to enhance *colonia* resident mobility thereby improving their quality of life.

### Former SWUTC Students Return for Presentations

**Mr. Marshall Cheek**, of Lockwood , Andrews, and Newnam, Inc., and a 2006 graduate of the SWUTC Transportation Scholars program returned to the Texas A&M University campus on February 12th to give a presentation to the student chapter of ITE. Marshall's presentation titled "Houston Metro LRT Traffic Design and Analysis", provided the audience with a basic understanding of traffic engineering elements that were conducted while designing the Houston Metro Southeast Corridor Light Rail Transit system. This presentation showed typical intersection traffic signal design plans, and will show problems encountered throughout the design process. Additionally, this presentation showed the audience how the traffic impact study was conducted for the Southeast Corridor and traffic simulation tools used to complete the study.

On April 15th, **Mr. Scot Johnson**, of Kimley-Horn and Associates, Inc., and a 1999 graduate of the TAMU Transportation Scholars program, returned to campus to make a presentation titled "On Both Sides of the Street" to the student chapter of ITE. His presentation discussed the basic elements of traffic impact analyses, the similarities and differences of performing and reviewing the studies, and how a consultant can without conflict serve both public and private sector clients when it comes to this type of work.

### SWUTC Initiates Development of Dataset for Use in Transportation Planning Courses

With fuel prices rising in a systemic and sustained manner in 2007 and 2008, recent articles in the popular press have focused increasingly on their influence on the driving patterns and other decisions of commuters. This present time will also be the subject of many scholarly papers published in the next several years. Coursework in transportation planning, however, requires something between anecdotal reporting and journal articles published in 2012. This SWUTC project builds on a preliminary analysis of the relationship between gasoline price and fuel consumption already prepared for Texas. The research will prepare a dataset that can be used in courses in the Fall 2008 and Spring 2009 semesters when students may be particularly open to the role of data and research in understanding the effects of fuel price increases on travel demand, mode choice, housing and school enrollment (as a symptomatic indicator of changing settlement patterns by family type).

### Student Kudos

University of Texas Advanced Institute student, **Mr. Jason Lemp**, won the *2008 Eisenhower Travel Fellowship* for travel to the January 2008 TRB meeting where he presented the paper titled "Quantifying the External Costs of Vehicle Use: Evidence from America's Top Selling Light-Duty Models."

On April 4, SWUTC graduate researcher at Texas Southern University, **Ms. Lei Guo**, received a \$1000 scholarship from the Woman's Transportation Seminar Houston Chapter at its annual scholarship dinner at the Hyatt Regency Hotel in Houston, Texas.

**Ms. Nevena Vajdic**, SWUTC graduate researcher at Texas A&M University, has received a distinguished *International Road Federation (IRF) Fellowship*. Vajdic is currently earning her master's degree in construction engineering and management.

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**Ms. Alison Conway**, Ph.D. student in transportation engineering and SWUTC Advanced Institute student at the University of Texas at Austin, has been selected to participate in the 2008 Eno Leadership Development Conference by the Board of Regents of the Eno Transportation Foundation. The Leadership Development Conference selects 20 graduate students from around the nation to get a first-hand look at how transportation policy is developed and implemented. During the conference, these students will have meetings with federal officials as well as leaders of business and non-profit organizations.

**Mr. Xiugang Li**, this year's winner of the SWUTC *Dr. Robert Herman Most Outstanding Student Award*, was selected to represent the SWUTC and traveled to Washington D.C. in January to be honored at the Outstanding Student of the Year ceremony during the annual CUTC/UTC Banquet. (See December 2007 newsletter issue for more information on Xiugang Li)



Administrator Paul Brubaker presents Xiugang Li with the SWUTC Student of the Year Award

## Technology Transfer Highlights

### SWUTC Researchers Hit the Road

The following is a listing of SWUTC staff who presented study findings based on their SWUTC research.

**Mr. Nathan Hutson** of the University of Texas at Austin presented *Profile of Dray Activity and the Dray Industry at the Port of Houston* at the 49th Annual Transportation Research Forum, Fort Worth, Texas, March 17-19, 2008.

**Mr. Robert Harrison** of the University of Texas at Austin presented *Characteristics of the Dray Sector* at the 49th Annual Transportation Research Forum, Fort Worth, Texas, March 17-19, 2008.

**Mr. Jeff Borowiec** and **Mr. Jeff Warner** of Texas A&M University presented *Evaluation of the Role and Needs of Air Cargo in Texas* to the 49th Annual Transportation Research Forum, Fort Worth, TX, March 17-19, 2008.

**Dr. Luca Quadrifoglio** and **Mr. Xiugang Li** of Texas A&M University presented *Feeder Transit Services: Fixed or Demand Responsive?* at the 2008 Southwest Regional Conference of the Institute for Operations Research and Management Science (INFORMS), College Station, TX, April 18-19, 2008.

### 87th Annual TRB Meeting Presentations

**Dr. Yunlong Zhang**, **Mr. Zhirui Ye** and **Mr. Yuanchang Xie** of Texas A&M University presented *Estimation of Large Truck Volume Using Single Loop Detector Data*.

**Dr. Ivan Damnjanovic** of Texas A&M University presented *Modeling Effects of Rehabilitation Actions on Reliability of Flexible Pavements*.

**Dr. Luca Quadrifoglio** of Texas A&M University presented *Feeding with Demand-Responsive or Fixed-Route Transit: A Simulation Analysis for Decision Making*.

**Dr. Sharada Vadali** and **Mr. R. Sen Gupta** of Texas A&M University presented *A Stochastic Dominance Approach to Evaluate Optimism Bias in Truck Toll Forecasts*.

**Dr. Sharada Vadali**, **Dr. Madhav Pappu** and **Ms. Katie Womack** of Texas A&M University presented *Freight Route Decision Making in the Presence of Tolling: Evidence from Texas Focus Groups*.

**Ms. Alison Conway** and **Dr. C. Michael Walton** of the University of Texas at Austin presented *Analysis and Cost-Recovery Optimization Methodology for a Fixed-Class Tolling Structure*.

**Mr. Stephen Boyles** and **Dr. S. Travis Waller** of the University of Texas at Austin presented *The Impact of Utility Function Choice in Online Shortest Paths*.

**Ms. Rachel Copperman** of the University of Texas at Austin presented *An Analysis of Children's Activity and Travel Patterns*.

**Mr. N. Eluru, Mr. A. R. Pinjari, Ms. J.Y. Guo, Mr. I.N. Sener, Mr. S. Srinivasan, Ms. R.B. Copperman and Dr. C.R. Bhat** of the University of Texas at Austin presented *Population Updating System Structures and Models Embedded Within the Comprehensive Econometric Microsimulator for Urban Systems (CEMUS)*.

**Mr. Saurabh Kumar** and **Dr. Kara Kockelman** of the University of Texas at Austin presented *Tracking the Size, Location and Interactions of Businesses: Microsimulation of Firm Behavior in Austin, Texas*.

## Recently Published Reports and Journal Articles

Each of the following publications are available in PDF format at  
<http://swutc.tamu.edu/publications.htm>

Compendium of Student Papers: 2007 Undergraduate Transportation Scholars Program, H. Gene Hawkins, editor, Texas A&M University, August 2007, 114 pp. (473700-00003-12)

- *Analysis of Trip Generation Estimates for Mixed-Use Development*, Matthew Ciarkowski
- *Pedestrian and Motorist Perception of Pedestrian Signs in Work Zones*, Nathan Fluker
- *Analysis of Driver Compliance with Work Zone Speed Limits*, James Richter
- *Nighttime Driver Needs: An Analysis of Current Guide Sign Standards and Need for Change*, Marc Sandhu

A Synthesis of Warm-Mix Asphalt, Joe W. Button, Cindy Estakhri, and Andrew Wimsatt, Texas A&M University, July 2007, 94 pp. (0-5597-1)

North American Transportation Corridor Network, Juan C. Villa and Christopher W. Rothe, Texas A&M University, July 2007, 109 pp. (473700-00091-1)

Calibration of Pavement Response Models for the Mechanistic-Empirical Pavement Design Method, Rong Luo and Jorge A. Prozzi, University of Texas at Austin, September 2007, 85 pp. (167264-1)

Population Updating System Structures and Models Embedded Within the Comprehensive Econometric Microsimulator for Urban Systems (CEMUS), Naveen Eluru, Abdul Rawoof Pinjari, Jessica Y. Guo, Ipek N. Sener, Sivaramkrishnan Srinivasan, Rachel B. Copperman, and Chandra R. Bhat, University of Texas at Austin, October 2007, 44 pp. (167260-1)

Drayage Activity in Texas, Robert Harrison, Nathan Hutson, Jolanda Prozzi, Jason West, Juan Gonzalez and John McCray, University of Texas at Austin, October 2007, 86 pp. (0-5684-2)

Guidelines for Hurricane Evacuation Signing and Markings, Brooke R. Ullman, Nada Trout, and Andrew J. Ballard, Texas A&M University, December 2007, 22 pp. (0-4962-1)

Evaluation and Optimization of Durable Pervious Concrete for Use in Urban Areas, Youngmin Joung, Zachary C. Grasley, Texas A&M University, December 2007, 77 pp. (167163-1)

Microsimulation of Household and Firm Behaviors: Coupled Models of Land Use and Travel Demand in Austin, Texas, Saurabh Kumar and Kara M. Kockelman, University of Texas at Austin, December 2007, 147 pp. (167262-1)

Investigation of Deer-Vehicle Crash Data and Countermeasure Implementation in Texas, Keith K. Knapp, Texas A&M University, February 2008, 36 pp. (167170-1)

Real-Time Data for Hurricane Evacuation in Texas, Darrell W. Borchardt and Darryl D. Puckett, Texas A&M University, February 2008, 45 pp. (167764-1)

Estimation of Toll Road Users Value of Time, Dong Hun Kang and William R. Stockton, Texas A&M University, February 2008, 111 pp. (473700-00084-1)

Evaluation of the Role and Needs of Air Cargo in Texas, Benjamin R. Sperry, Jeffery E. Warner, and Jeffrey D. Borowiec, Texas A&M University, March 2008, 128 pp. (473700-00037-1)

An Analysis of the Texas 2002 Safe Routes to Schools Program in Selected Cities, Gwen Goodwin and Yasmina Soria, Texas Southern University, March 2008, 48 pp. (167362-1)

Simulating Land Use Impacts of Highway Development in the Texas Triangle - A Case Study of the Austin Metropolitan Region, Ming Zhang and Tian Haung, University of Texas at Austin, March 2008, 63 pp. (167266-1)

A Synthesis of Transportation Emissions Research: Current Status and Future Directions, Lei Yu, Shichen Jia, and Qinyi Shi, Texas Southern University, April 2008, 111 pp. (473700-00049-1)

Recently Published Journal Articles Based on SWUTC Research (not available in PDF format)

International Trade, Transportation Corridors and Inland Ports: Opportunities for Canada, Robert Harrison, University of Texas at Austin, published as a web based collection of invited papers sponsored by Transport Canada, 2008.

Determining Management Sections to Minimize Cost Performance-based Pavement Maintenance Contracts, K. Seok, I. Damjanovic and M. Gunby, Texas A&M University, published in the ASCE Journal of Infrastructure Systems, January 2008.

Integration of Activity-based Modeling and Dynamic Traffic Assignment, D.Y. Lin, N. Eluru, S. Travis Waller, and Chandra Bhat, University of Texas at Austin, published in the Transportation Research Record, 2008, Paper #08-2534.

Incorporating Environmental Justice Measures into Equilibrium-Based Transportation Network Design, Jennifer Duthie, S. Travis Waller, University of Texas at Austin, published in the Transportation Research Record, 2008, Paper #08-1106.

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