

# SWUTC News

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

## Outstanding Student Awards

Each year, in addition to selecting the overall SWUTC Outstanding Student to represent the SWUTC at TRB, the SWUTC honors two other students for their academic, professionalism and leadership achievements. Each of the three major awards presented yearly at the SWUTC - the Robert Herman Outstanding Student Award, the William J. Harris Outstanding Ph.D. Student Award and the Naomi Ledé Outstanding Masters Student Award - comes with a \$1,000 cash award.

### *Robert Herman Outstanding Student Award*

Upon completion of his undergraduate education in Civil Engineering from the Indian Institute of Technology at Madras in India, **Mr. Naveen Eluru** enrolled at the University of Texas at Austin to pursue his Masters in Transportation. While at UT-Austin Mr. Eluru enrolled in courses that highlighted the multi-disciplinary nature of transportation such as operation research, optimization and economics. As part of his Master's thesis, Mr. Eluru examined the impact of seat belt use in modeling injury severity of drivers involved in traffic crashes. Afterwards, he made the decision to stay at UT-Austin and pursue doctoral studies.

For his doctoral thesis he is examining activity-travel pattern attributes with an emphasis on incorporating the effect of transportation and land-use interactions on activity-travel patterns. The objective of his dissertation is to develop advanced econometric models that appropriately account for behavioral realism. While examining activity-travel patterns for his dissertation, he also worked on a wide range of subject areas including transportation safety, residential and work place location choice, bicycle ownership, and household vehicle ownership.



Mr. Eluru has also participated in several sponsored research efforts. Through the SWUTC research program, he incorporated econometric models into a Comprehensive Econometric Microsimulation for Urban Systems (CE-MUS). He also presented a paper at TRB in 2008 based on this research. In addition, he has taken part in TxDOT research efforts in which he contributed to developing activity-based modeling software for metropolitan regions in Texas.

*Continued on page 2*

## In this Issue:

- 1 Student Awards
- 3 SWUTC Family News
- 4 New Research Highlights
- 6 Education Highlights
- 7 Technology Transfer News
- 8 Published Reports



December 2008

*Continued from page 1*

Mr. Eluru has been an active member of the ITS and ITE organizations. He is currently a young committee member for the TRB Committee on Transportation Education and Training. His long term goal is to pursue a career in academia as a professor to contribute to the transportation community through research and teaching. Mr. Eluru's major professor is Dr. Chandra Bhat.

### *William J. Harris Outstanding Ph.D. Student Award*

**Dr. Rachel B. Copperman** began her graduate studies at the University of Texas at Austin in August 2004. She enrolled at UT-Austin immediately following her graduation from the University of Virginia with a B.S. in Systems Engineering. While in pursuit of a Ph.D., she also received her M.S.E. in Civil Engineering.

Dr. Copperman's dissertation research focused on understanding the motivations and behavior underlying children's travel patterns. As a graduate research assistant she also researched in the area of activity-based travel demand modeling by contributing to the development of a continuous-time activity-travel prediction software for the Dallas Fort-Worth (DFW) area. During her graduate studies, Dr. Copperman was a recipient of the Eisenhower Graduate Transportation Fellowship and a UT Continuing Fellowship. She attended the 2005 ENO Leadership Development Conference and was a recipient of the 2006 SWUTC Dr. Naomi Ledé Award to the Outstanding Masters Student. She is also the past President a past Vice President of the University of Texas at Austin's student chapter of ITE.

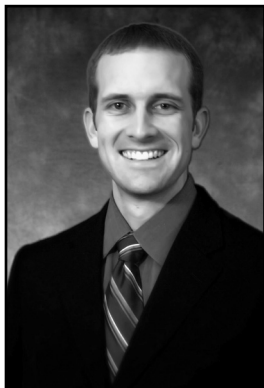


After receiving her Ph.D. in August 2008, Dr. Copperman accepted a position as a Travel Demand Forecaster at Cambridge Systematics, a leading transportation planning consulting company.

Dr. Copperman's major professor while at the University of Texas was Dr. Chandra Bhat.

### *Naomi Ledé Outstanding Masters Student Award*

**Mr. Cameron L. Williams** received his M.S. and B.S. from Texas A&M University where he graduated Summa Cum Laude. Cameron's thesis focused on developing an automated method using the global positioning system for identifying no-passing zones on rural highways. While at Texas A&M, Cameron received a fellowship from the SWUTC's Transportation Scholars Program and was named a 2007 ENO Fellow for which he attended the ENO Leadership Development Conference. He also received the Texas Transportation Institute's Keese-Wootan Transportation Fellowship, the Zachry Department of Civil Engineering Department Head Fellowship, and the Texas A&M College of Engineering Turner Leadership Award. In 2007 he was named Texas A&M's Most Outstanding Masters Student in the SWUTC. Cameron served as the president of Texas A&M's 2007 ITE chapter, which earned the 2007/2008 Outstanding Student Chapter Award for ITE District 9. Previously, Cameron served for one year as president of Texas A&M's Student Engineers' Council.

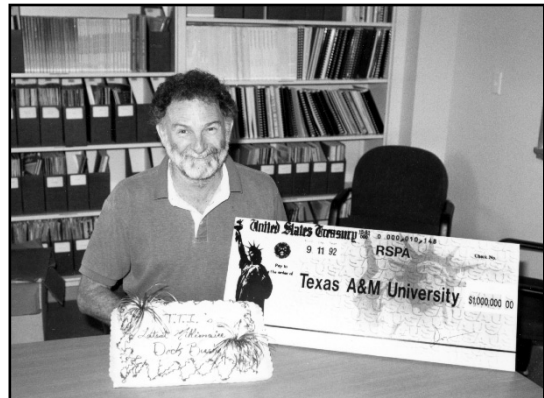


Cameron L. Williams is currently employed in the traffic engineering services at Walter P. Moore and since being employed there has had the unique opportunity to work on a Safe Routes to School Program for 48 elementary schools in the City of El Paso, Texas.

While at TAMU, Cameron's major professor was Dr. Gene Hawkins. Cameron will be representing the SWUTC at the annual UTC Outstanding Student of the Year Awards ceremony during TRB's Annual Meeting in January, 2009.

## SWUTC Celebrates 20th Year Anniversary

Founded in 1988 “to advance U.S. technology and expertise in the many disciplines comprising transportation through the mechanisms of education, research and technology transfer”, the SWUTC is one of the initial ten regional UTCs selected to carry out this mandate. In the intervening years and through four successful recompetitions the one overriding strength that has allowed the SWUTC to endure and grow is the commitment of our consortium members, Texas A&M University, Texas Southern University and the University of Texas at Austin. Through their efforts, and with the support of the State of Texas which provides matching funds for our federal grant, the SWUTC has been able to fund 519 innovative, often times, cross-discipline research efforts. The SWUTC created a highly successful education program that develops and enhances transportation courses, and provides scholarships, stipends and research assistantships to attract the best students into the graduate and undergraduate transportation programs at each university. Through the 20 years of SWUTC operation, 310 students have graduated from our advanced level education programs and joined the professional transportation workforce within private industry, government or academic entities. Many of these former students are now leaders and mentors in the transportation community for the next generation of transportation professionals.



Director Dock Burke celebrating first successful SWUTC recompetition in 1992

As we recap our accomplishments from the past 20 years, we look forward to continuing our innovative transportation education, research and technology transfer programs for many years to come.

---

## Spin-Off Funding Produced by SWUTC Education Outreach Programs

Since 2000, the SWUTC has funded educational outreach programs targeting K-12 students under the leadership of **Ms. Debbie Jasek** of Texas A&M University. Programs she developed with SWUTC funding include educational modules that introduce transportation careers to students, road-show promotional material for use at career fairs, the *Transportation Career Guide* and the promotion of transportation science at science fairs. She also developed the Go Girl! program for K-9 girls, the On the Move! program for students grades 5-9, and the expansion of the Texas Summer Transportation Institute to include programs at rural Texas locations to provide educational opportunities to mainly Hispanic students. Through these efforts, Debbie has successfully created coalitions across Texas to provide outreach to students at all levels. And because of her knowledge and experience, she was recently awarded a \$455,500 interagency contract from the Texas Department of Transportation (TxDOT) to partner with the Texas Engineering Extension Service (TEEX) to create a statewide on-the-job training and supportive service program for Texas. This program will focus on reaching women, minorities, and the disadvantaged for participation. The Texas Construction Career Academy (CCA) is envisioned to be a two to three week program that will provide training, employment opportunities and supportive services to those individuals interested in entering the highway construction workforce.



Ms. Debbie Jasek

## New Research Highlights

*This year, the SWUTC selected 45 new research studies to fund. Four of these are highlighted below.*

### Public Transit

With her new SWUTC research study, **Dr. Talia McCray** from the University of Texas at Austin is examining an under addressed transportation issue: how transportation (modal use: bus, car walking, biking) and land-use patterns affect the activity choices of urban teenagers, especially those who are low-income. If it is true that access to a car maximized one's ability to participate in meaningful activities, how does the existence or non existence of an auto shape a teenager's activity space for employment, school, and recreation? For many low-income families, living in cities characterized by sprawl, a high percentage of their destinations are not within walking distance, and a bike is often not a chosen mode for work related activities. Therefore; many families rely heavily on public transit and organize their activities spatially around public transit routes.



Dr. Talia McCray

This study aims to address the accessibility needs of low-income teenagers. It will also analyze if mobility training programs that have already been successfully implemented for the elderly population, which include routing assistance, connecting flexible routes with fixed routes and how to plan multiple trips, could be applied to give transit system life-skills to teenagers. This project seeks to explore creative techniques, both for data collection and analysis in addressing teenagers perceptions of public transit and use of public transit. In addition, the study will design and distribute a travel survey to the larger population of students (~400) to address typical activities and modal use, along with socio-economic factors. The project seeks to understand the spatial and temporal constraints that exist for urban teenagers. Since they are tomorrow's workforce, teenagers are an ideal audience to bring about change in travel behavior and change in attitudes towards the environment.

### Pedestrian Safety

**Dr. Yi Qi** of Texas Southern University has as the objective of her research to develop pedestrian safety based warrants for permissive left-turn control. In this research, the driving-simulation based experiments will be conducted for identifying and assessing the impacts of the factors that contribute to the crashes between left-turn vehicles and pedestrians during the left-turn permissive phase. For the intersections with permissive only or protected/permissive left-turn (PPLT) control, pedestrians will move at the permissive phase with the parallel through vehicular movement. This requires left-turn turn vehicle to yield to both opposing vehicles and pedestrians prior to selecting an appropriate gap. Pedestrian accident risks are increased in such complicate driving conditions if left-turn vehicles make misjudgments and fail to yield to the pedestrians. The year 2002 National Highway Traffic Safety Administration's pedestrian crash facts show that a pedestrian is killed or injured in an intersection crash every 16 minutes, and pedestrian involved crashes occur far more often with left-turning vehicles than with right-turning and straight through vehicles, partly because drivers are not clearly able to see pedestrians on the left.



Dr. Yi Qi

The existing guidelines on left-turn operations mainly focus on the traffic conditions at the intersections. Few of them give particular considerations on the pedestrian safety problems in the determination of the most appropriate left-turn control mode for an intersection. For example, the exiting warrants for PPLT control are developed mainly based on the left-turn and the opposing through traffic volumes, while the pedestrian volumes and other pedestrian safety related factors, such as the features of the crossroads, the sun light directions and the sight distance of the left-turn drivers, have not be explicitly taken into account by these existing warrants.

## Highway Safety

The U.S.-Mexico border region experiences a concentrated flow of hazardous materials (hazmat). On the Mexican side, 2,600 manufacturing plants use and produce an enormous amount of hazmat. Under NAFTA requirements, all hazmat that is shipped into Mexico or generated during the manufacturing process must be shipped back to its point of origin, typically the United States. Thus, the delivery and return of hazardous materials have created a hazmat transportation corridor.

At the present, there is no automated, real-time method to track these shipments anywhere along the U.S.-Mexico border (or the U.S.-Canadian border). As a result, border stakeholders do not have access to information that will tell them the kinds, amounts, and methods of transporting hazardous materials through their communities. This lack of information hinders a community's ability to respond to hazmat incidences, to plan hazmat transportation routes, and to develop effective transportation systems. Hazmat incidents that occur on either the U.S. or Mexican side of the border usually require the coordination of first responders on both sides to resolve the incident in a timely manner.

To address this problem, the Environmental Protection Agency (EPA) has proposed using networked radio-frequency identification systems (RFID) to track the cross-border flow of hazmat. The EPA contracted with a team led by Barry Thatcher (New Mexico State University) to create the test plan and to solicit vendor collaboration. Scheduled for this summer, the field test will assess the ability of the RFID technologies to track simulated hazmat shipments in a real-world route: across the Santa Teresa, New Mexico and San Jeronimo, Mexico International Ports of Entry and on arrival and departure from storage facilities in Southern New Mexico and maquilas in Cd. Juárez, Mexico. Ten RFID vendors have prepared specific RFID technologies for the test and have committed to setup these technologies in the border area at their cost.

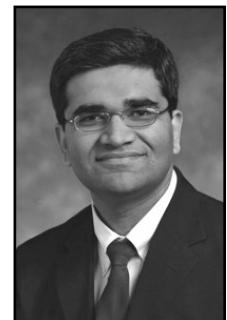
This project, led by **Dr. Rajat Rajbhandari** of Texas A&M University, will build on the RFID field test and the Texas Transportation Institute's efforts to develop an El Paso transportation data warehouse to create and implement a pilot hazmat information management system. The pilot system will test the ability to relay hazmat information from the RFID system in real-time to first responders in U.S. and Mexico.



Dr. Rajat  
Rajbhandari

## Materials

The beam fatigue test or overlay test are examples of test methods that are used to evaluate the fatigue cracking resistance of full asphalt mixtures. Although these tests are easy to perform and interpret, the high variability in the test results makes it difficult to evaluate the influence of mixture design variables on its fatigue cracking resistance. More recently, the Dynamic Mechanical Analyzer (DMA) was used to identify the fatigue cracking resistance of sand-asphalt mixtures with improved precision. The findings from these studies have generated interest in the research and transportation agencies to evaluate the performance of sand-asphalt mixtures and propagate this information to predict the fatigue cracking resistance of full asphalt mixtures. However, there is lack of evidence to support the premise that sand-asphalt mixtures replicate the microstructure of the same phase within the full asphalt mixture. The internal microstructure or distribution of air voids and film thickness dictates the fatigue cracking characteristics of the mix.



Dr. Amit Bhasin

The main objectives of this research being conducted by **Dr. Amit Bhasin** formerly at TAMU and now on the faculty at the University of Texas at Austin are: 1) to compare the internal micro-structure of sand-asphalt mixtures prepared using current procedures to the internal micro-structure of the representative portion of the full asphalt mixture, 2) refine procedures used to produce sand-asphalt mixture specimens to achieve a micro-structure representative of the full asphalt mixture, 3) determine variability in the internal micro-structure of replicate specimens of full asphalt mixtures, and 4) provide a semi-quantitative assessment on the contribution of the variability in internal micro-structure to the variability in the results from fatigue tests conducted on full asphalt mixtures. The internal microstructures of full asphalt mixtures and sand-asphalt mixtures will be determined using the newly acquired high resolution X-ray tomography equipment at the University of Texas at Austin.

### SWUTC Provides Support to Bush School Capstone Course



Dr. Eric Lindquist

This project, led by **Dr. Eric Lindquist** of Texas A&M University will support the Bush School of Government and Public Service course *The Regional Impact of Climate Change on Transportation Infrastructure and Decision Making* and focus on the current and future institutional structures and legislative authority necessary to implement the major infrastructure investments for resilience and recovery in response to the impact of climate change in the Houston-Galveston area in Texas.

The Capstone Seminar is a two-semester project in which a team of students works for a real-world client to help solve a real-world management and/or policy issue. It culminates in a formal, written report and an oral presentation in which that report is delivered to the client. Although the projects are supervised by a faculty member, the students typically have broad discretion in allocating tasks among themselves, in communicating with clients, and in establishing and ensuring compliance with deadlines for the accomplishment of different phases of the project.

Preliminary consultation with the Houston Galveston Area Council (HGAC) resulted in the identification of the general problem to be addressed. The HGAC and its constituents are concerned that the region may not have the proper and appropriate institutional structures in place to direct major investments for recovery and for developing resilience in response to the impacts of climate change. As the impact from climate change is perceived as a regional problem that does not adhere to institutional boundaries, the Council is also concerned that they may not have the necessary legislative authority to share revenues and plan collectively to address these challenges.

The Capstone students will present their final project results in two venues: 1) the standard end of the year Capstone project presentation at the Bush School, and 2) for the client and invited guests in the study area. Results will also be published in a professional research report and disseminated to the client, project stakeholders, and made available on the Bush School and SWUTC websites.

#### Former TAMU Transportation Scholars Program Graduate Speaks to Students

Former TAMU-ITE Chapter President **Cameron Williams** delivered a presentation to the current chapter members on December 3rd discussing the opportunities and challenges faced by recent engineering graduates and what they can do to be better prepared for the workplace.

#### Important Upcoming Deadlines

##### University of Texas at Austin Undergraduate Summer Internship in Transportation (USIT 2009)

Deadline for submitting an application to participate in the summer 2009 program is March 16, 2009. This program is an intense 11-week program that provides unique insight into transportation engineering education and a possible career in the field. Financial support is provided. Please visit <http://swutc.tamu.edu/utaeducation.htm> for more information.

##### Texas A&M University Undergraduate Transportation Scholars Program (UTSP 2009)

Deadline to submit an application for the summer 2009 program is February 27, 2009. This program is a 10-week program designed to introduce transportation to upper-level engineering students and provide them with a research/work experience that will help them get a head start on their careers. Financial support is provided. Please visit <http://swutc.tamu.edu/tamu-education.htm> for more information.

## *Where Are They Now?*

Congratulations to the recent graduates of the SWUTC Education Program who have joined the transportation workforce.

### University of Texas at Austin Graduates

**Ricardo Aitken** - Project Engineer for Calvin Giordano & Associates

**Rachel Copperman** - Analyst for Cambridge Systematics

**Kate Flannigan** - Project Engineer for CINTRA Developments LLC

**Ian Hlavacek** - Senior Associate Engineer for Traffic Engineers, Inc.

**Eric Spurgeon** - Transportation Planner for Louis Berger Group

**Jason West** - Project Engineer for CINTRA Development LCC

## *Technology Transfer Highlights*

### *SWUTC Researchers Hit the Road*

**Ms. Suma Tirumalachetty, Dr. Kara Kockelman** and **Mr. Saurabh Kumar** from the University of Texas at Austin presented *Micro-simulation Models of Urban Regions: Anticipating Carbon Emissions from Transport and Housing in Austin, Texas* at the North American Meetings of the Regional Science Association International, Brooklyn, N.Y., November 2008.

**Dr. Fengxiang Qiao, Dr. Ruixin Ge** and **Dr. Lei Yu** from Texas Southern University presented *Transportation Evacuation Framework for Small and Dense Area* at the Severe Storm Prediction, Education, and Evacuation from Disasters (SSPEED) Conference at Rice University, Houston, TX, October 29-31, 2008.

**Mr. Shawn Turner** of Texas A&M University presented *Walk, Bike, and be Counted: A Review of Automated Bike and Pedestrian Sensors/Counters* at the Pro Walk/Pro Bike 2008 Conference, Seattle, WA, September 2-5, 2008.

## *Recently Published Reports*

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

Loss Modeling for Pricing Catastrophic Bonds, Ivan Damnjanovic, John B. Mander and Jyotirmoy Sircar, Texas A&M University, December 2008, 80 pp. (167172-1)

Measuring the Marginal Cost of Congestion, Mark Burriss and Sunil Patil, Texas A&M University, December 2008, 70 pp. (473700-00088-1)

An Assessment of Transit Ridership: Increased Suburban to Urban Public Transportation Options in Houston, Texas, Jamaal Schoby and Carol A. Lewis, Texas Southern University, November 2008, 90 pp. (473700-00053-1)

Analysis and Assessment of Microbial Biofilm-Mediated Concrete Deterioration, David Trejo, Paul de Figueiredo, Mauricio Sanchez, Carlos Gonzalez, Shipping Wei, and Lei Li, Texas A&M University, October 2008, 38 pp. (476660-00008-1)

*Continued on page 8*

A Comprehensive Assessment of Children's Activity and Travel Patterns, Rachel B. Copperman and Chandra R. Bhat, University of Texas at Austin, September 2008, 104 pp. (167270-1)

Characteristics of Drayage Operations at the Port of Houston, Robert Harrison, Nathan Hutson, Jason West and Julie Wilke, University of Texas at Austin, September 2008, 40 pp. (473700-00075-1)

Transportation Infrastructure and Quality of Life for Disadvantage Populations: A Pilot Study of El Cenizo Colonia in Texas, Cecilia Giusti, Chanam Lee, Dominique Lord and Meghan Wieters, Texas A&M University, September 2008, 126 pp. (167162-1)

On the Move! Exploring Transportation Career Horizons, Debbie Jasek, Texas A&M University, August 2008, 34 pp. (167164-1)

Integration and Consolidation of Border Freight Transportation Data for Planning Applications and Characterization of NAFTA Truck Loads for Aiding in Transportation Infrastructure Management: Second Year, Jolanda Prozzi, Jorge Prozzi, Juan C. Villa, Dan Middleton, and Jeffery E. Warner, Texas A&M University, July 2008, 106 pp. (0-5339-2)

Developing Specifications for Performance-Based Maintenance Contracts, Ivan Damjanovic, Seok Kim and Vighnesh P. Deshpande, Texas A&M University, June 2008, 82 pp. (167161-1)

Analysis of Federal and State Discretionary Funding of Highway and Transit Projects in FTA Region VI 1993-2000, Ronald Goodwin and Gwen Goodwin, Texas Southern University, June 2008, 32 pp. (167622-1)

A Scoping Study of the Impacts of Bioenergy and Alternative Fuels on the Southwest Region's Economy and Transportation Infrastructure, Leigh B. Boske and James T. Woodward, University of Texas at Austin, May 2008, 101 pp. (167271-1)

Texas Urban Triangle: Framework for Future Growth, Michael Neuman and Elise Bright, Texas A&M University, May 2008, 34 pp. (167166-1)

Performance Assessment and Comparison between Fixed and Flexible Transit Services for Different Urban Settings and Demand, Luca Quadrifoglio and Xiugang Li, Texas A&M University, May 2008, 46 pp. (473700-00090-1)

An Evaluation of Environmental Justice and Environmental Equity: Laws and Issues that Affect Minority and Low-Income Populations, Edward Owens, Gwendolyn Goodwin, Carol A. Lewis and Jeffrey Mallory, Texas Southern University, May 2008, 70 pp. (167921-1)

*SWUTC News* is published biannually by the Southwest Region University Transportation Center. Submission of articles, events or other information are welcome.

Reporter | Editor  
Barbara Lorenz

Photography | Graphic Design  
Ivan Lorenz, John Hobbs

### *For More Information*

We can be reached at:

Southwest Region University  
Transportation Center  
Texas Transportation Institute  
Texas A&M University System  
3135 TAMU  
College Station, Texas 77843-3135

Phone: (979) 845-5815  
Fax: (979)845-9761  
e-mail: b-lorenz@tamu.edu

Or visit our home page at:  
<http://swutc.tamu.edu/index.htm>

