Southwest Region University Transportation Center



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 more 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

Yuanchang Xie, transportation doctoral student at Texas A&M University was selected to win this award for his outstanding academic performance, ability to conduct scholarly research and publish in high quality journals, and active involvement and leadership in student chapter activities.

Yuanchang has a particular interest in applying advanced theories and techniques to transportation applications. Previously Yuanchang worked on SWUTC research project "Accurate Speed Estimation Using Single Loop Detector Data" and made significant contributions to the project. He is coauthor on a paper based on this project that has been submitted to a journal. Currently, he is lead researcher on another SWUTC project titled "Development and Evaluation of Multi-Agent Based Neuro-Fuzzy Arterial Traffic Signal Control System".



During the past two years, Yuanchang has had three journal papers published and two other papers accepted for publication. He had three papers accepted for presentation at the 2007 TRB annual meeting. In addition, two other papers were presented at the 9th International Conference on Applications of Advanced Technology in Transportation.

Yuanchang maintains a perfect 4.0 GPA academic record while taking advanced classes in civil engineering, statistics and industrial engineering. He is also the corresponding secretary of Texas A&M's ITE Student Chapter. Yuanchang's major professor is Dr. Yunlong Zhang.

Continued on page 2

In this Issue:

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



May 2007

William J. Harris Outstanding Ph.D. Student Award

Jennifer Duthie, doctoral student at the University of Texas at Austin Transportation Engineering program was selected to receive this award in recognition of her leadership on multiple research projects, her strong personal and professional service activities, her excellence in the classroom, her superior dissemination of her work through conferences and publications and her successful mentoring of undergraduate students.

Jennifer has already made fundamental contributions through her research over the course of her graduate study. Her work on new approaches for robust network analysis provides a novel and needed approach to the field of transportation planning. Her most recent research project effort on the inclusion of Environmental Justice within the transportation planning process via quantified network models was entirely her endeavor. She developed the idea while undertaking a six month internship at the North Central Texas Council of Governments. She has presented the results of research work at numerous national and international forums such as the annual meeting of the Institute for Operations Research and Management Science (INFORMS), the Transportation Research Board, and Regional Science.



While excelling in her classroom work, Jennifer served as mentor for two under-

graduate students. Her role has been critical in terms of involving these students in the research process and encouraging them to pursue further graduate studies in Civil Engineering. In addition, Jennifer has been active in special events to encourage K-12 female students to pursue careers in science and engineering. Jennifer's major professor is Dr. Travis Waller.

Naomi Ledé Outstanding Masters Student Award

Rachel B. Copperman is currently a Ph.D. student at the University of Texas at Austin in transportation engineering. She received her M.S.E. from The University of Texas at Austin in Civil Engineering and her B.S.

from the University of Virginia in Systems Engineering. Rachel's master's thesis and dissertation research focuses on understanding the motivations and behavior underlying children's travel patterns. She is also currently researching 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. Rachel is a current recipient of the Eisenhower Graduate Transportation Fellowship and attended the 2005 ENO Leadership Development Conference. She is also the current President and a past Vice President of The University of Texas at Austin's student chapter of ITE. Rachel received the SWUTC Dr. Naomi Ledé Award to the Outstanding Masters Student because of her all-round exemplary performance in academics, research quality and productivity, and leadership activities. Rachel represented the SWUTC at the annual UTC Outstanding Student of the Year Awards ceremony during TRB's Annual Meeting in January, 2007. Rachel's major professor is Dr. Chandra Bhat.



SWUTC Family News

SWUTC Researcher Honored with Two Teaching Excellence Awards

In January, University of Texas Transportation Engineering Professor and longtime SWUTC researcher **Dr. Chandra Bhat** was selected as the 2007 recipient of the *UT Outstanding Graduate Teaching Award*. The award honors faculty members for outstanding teaching at the graduate level and mentoring of graduate students. It is coordinated by the Graduate School and underwritten by the University Co-Op. Bhat has supervised around 40 graduate students since arriving at the university in 1997. Since 2000, his graduate students have won 15 external (non-university) awards. In the past five years, Dr. Bhat and his graduate students have jointly authored more than 40 refereed articles that have been published or are forthcoming.

Also in January, Dr. Chandra Bhat received the *Lockeed Martin Aeronautics Company Award* for Excellence in Engineering Teaching. This award recognized Dr. Bhat's reputation for ensuring students receive a stimulating, well-rounded education in transportation research and his resulting perfect scores on course evaluations some semesters. His open-ended discussion approach and insistence that students apply his classroom's data analysis methods to real-life transportation situations garner consistent praise from his students.

SWUTC Executive Committee Chairman Receives Two Transportation Achievement Awards

SWUTC Executive Committee Chairman and Texas Transportation Institute Director Emeritus **Dr. Herb Richardson** received two awards during the annual Transportation Research Board meeting in January. Dr. Richardson was presented the *Roy W. Crum Distinguished Service Award* January 24th during the Chairman's Luncheon at the Transportation Research Board (TRB) 86th Annual Meeting. The prestigious Crum Award recognizes outstanding achievement in the field of transportation research. In addition, Dr. Richardson received the 2007 Council of University Transportation Centers (CUTC) Award for Distinguished Contribution to University Transportation Education and Research. This award recognizes individuals with a long history of outstanding contributions to university education and research, resulting in a lasting impact on the transportation field.

SWUTC Researcher Receives TRB Committee Appointment

Dr. Kara Kockelman, professor of civil engineering at the University of Texas at Austin and key SWUTC researcher has been designated as Chair of the Transportation Research Board's Committee on Transportation Survey Methods, which is a three year term beginning in April 2007. Her graduate students are currently conducting a research study to explore public opinion of carsharing, a new strategy for reducing traffic congestion and emissions in Austin.

SWUTC Executive Committee Member Recognized for Workshop Leadership

Dr. Carol Lewis, SWUTC Executive Committee member and Director of the Center for Transportation Training and Research at Texas Southern University received a certificate of appreciation from TRB for chairing the 2007 Workshop "Out of the Rubble: Transportation and Land Use Community Resilience and Recovery" during the January meeting of the TRB's Transportation and Land Development Committee.

SWUTC Associate Director Service Honored

Dr. Gene Hawkins, Associate Director for TAMU Transportation Scholars Program and Associate Professor at TAMU's Zachry Department of Civil Engineering was honored for his six-year service as chair of TRB's Traffic Control Devices Committee.

Continued from page 4

SWUTC Researcher Receives CUTC Award

Dr. Mark Burris, assistant professor in the Zachry Department of Civil Engineering at Texas A&M University, and SWUTC researcher, was awarded the CUTC/ARTBA *New Faculty Award* in conjunction with the Transportation Research Board annual meeting in January. The award, co-sponsored by the Council of University Transportation Centers (CUTC) and the American Road & Transportation Builders Association (ARTBA), is given annually to a tenure-track faculty member in transportation engineering and recognizes outstanding teaching and research contributions to the transportation field.

New Research Highlights

This year, the SWUTC selected 35 new research studies to fund. A few of these are highlighted below.

Potential to Improve Rail International Intermodal Services in the Southwest Region of the United States

U.S Class One rail operations have worked closely over the past decade with marine ports handling international trade to offer efficient trans-continental transportation services to shippers, especially where containers are used to move the products. The growth in Asian trade with the U.S since 1995, powered by a surging Chinese economy, impacted both marine and rail services. First, and foremost, was the role of southern Californian ports – particularly terminals centered in the Los Angeles (LA) and Long Beach (LB) basins – which dominated Asian trade flows in the period 1994 through 2004. A combination of efficient terminals, short sailing routes and good connectivity with both Californian markets and competitive Class One rail services (essential for service to more distant U.S states) allowed LA/LB to handle over 70 percent of the Asian containers landed at U.S west coast ports by 2004. Howev-

er severe congestion at both port terminals in mid-2004, combined with a forecasted container growth in the double digits convinced shippers and steamship companies that other routes needed to be developed if Asian trade was to move efficiently to U.S markets.

For distances greater than 700 miles from any U.S port of entry, double stack rail service is the most cost-effective way to move containers and so rail planning is now seen as contributing to addressing certain highway capacity issues facing state Departments of Transportation. Texas and other south-western state transportation systems contain (a) elements of the Class One rail trans-continental systems serving west coast ports and (b) highway and rail networks carrying NAFTA goods between U. S-Mexico markets. Class One railroads are now covering their cost of capital – substantially



because of their intermodal operations –and are investing substantial amounts to improve the performance of their networks and are endeavoring to seek partners, where appropriate, who benefit from rail system improvements. Benefits that include improved air quality and reduced highway traffic impedance.

This study being conducted by **Mr. Rob Harrison** from the University of Texas at Austin is attempting to answer the important question: can the current Class One system in the southwest be reasonably improved to the point where it can help move both Asia and NAFTA traffic more efficiently? Opportunities for private-private and private-public investments will be considered. And finally, recommendations will be made to strengthen multi-modal transportation planning in the southwest region, especially Texas.

Study Takes an In-depth Look at the Developing E85 Industry

The 2005 Energy Policy Act introduced the Renewable Fuel Standard, which will double the use of ethanol and biodiesel in the US by 2012. In early 2006, the government's Advanced Energy Initiative confirmed the U.S. com-



mitment to alternative energy sources based on new technologies, including hybrid vehicles, ethanol and biodiesel, clean coal technology and hydrogen.

The energy bill established a renewable fuels standard to require the use of 7.5 billion gallons of ethanol and biodiesel by 2012, and extended tax benefits enabling both fuels to compete in today's market. The energy bill also provides a 30% tax credit for installation of alternative fuel stations, up to a maximum of \$30,000 per year. Currently only 556 public "E85" (85% ethanol) fueling stations exist in the U.S, and many more will be needed to increase the use of renewable fuels above the 10% that can be blended into conventional gasoline.

This study being conducted by **Ms. Sharon Boxill** of Texas Southern University is reviewing the current government initiatives for the use of alternative fuels, and expectations of future policy developments. She is also taking and in-depth look at the Ethanol 85 (E85) industry in terms of the outlook for

fuel supply and demand in the US from 2010-2030, current opportunities and challenges in the US ethanol sector and the economics of ethanol such as commercial issues driving ethanol development.

A Look at the Trucking Industry Response in a Changing World of Tolling and Rising Fuel Prices

In a recent Transportation Research Board document "Critical Issues in Transportation" inadequate revenue to finance capital needs in surface transportation was identified as a primary motivation to explore alternative revenue sources such as road tolls. As Texas and several states consider large scale tolling and the possibility of exclusive truck lanes, it is quite surprising to see that the trucking sector remains quite understudied. Trucking is currently the dominant mode of freight transportation – earning nearly 75% of the transportation industry's revenues while moving only 25% of the ton-miles – and this situation is likely to remain unchanged in the future. The trucking in-

dustry remains a highly competitive mode with modest profit margins ranging from 2% to 5%, extremely high sensitivity to fuel prices, and with high variable costs.

In her research, **Dr. Sharada Vadali** from Texas Transportation Institute is studying the impact of tolling in an era of rising fuel prices on various aspects of truck freight movement. Fuel constitutes the second largest expense for many trucking companies. However, it is not clear how toll roads are viewed in the context of rising operating costs relating to fuel; neither is it clear what the trade-offs are and how those trade-offs might manifest in a route making decision and of even greater interest is how those decisions and trade offs might vary across a broad spectrum of truckers in the transportation of cargo.



As Texas moves along to develop toll roads and tolls on trucks, this research is providing a key first step in understanding trade-offs, perceptions, and constraints. Preliminary results from Dr. Vadali's research have already led to two additional spin-off research projects. TxDOT has funded a study to explore truck tolling issues related to route diversion and preferences for the tolling options being immediately pursued for the Dallas area. And an additional TxDOT-GBE project exploring indexing potential economic effects of mobility projects effecting trucks has been funded. SWUTC Sponsors Inaugural Meeting of Deer-Vehicle Crash Information and Research Center

SWUTC researcher, Dr. Keith Knapp and the members of the eight-state Deer-Vehicle Crash Information and Research Center (DVCIR Center) Pooled Fund Project held their inaugural meeting Jan. 30-31 at the Minnesota Department of Transportation training facility in Shoreview, Minnesota. The group discussed the project organization and status and recent and ongoing deer-vehicle crash projects. They identified and prioritized potential research ideas for project funding. The Pooled Fund Project members decided to pursue four research projects that focus on defining and reducing the number of deervehicle crashes.

The members of the Pooled Fund Project are department of transportation employees from Connecticut, Iowa, Maryland, Minnesota, New Hampshire, New York, Ohio and Wisconsin. Those states, along with the Federal Highway Administration, have pooled their funds and have assembled more than \$300,000. The Southwest Region University Transportation Center and Center for Transportation Safety at TTI are supporting sponsors of the project.

SWUTC Researchers Hit the Road

Mr. Rob Harrison of the University of Texas at Austin presented *Characteristics of Drayage Operation at the Port of Houston* at the Third International Transportation Management Conference, New Orleans, LA, January 29, 2007.

Ms. Alison Conway graduate student from the University of Texas at Austin presented *Commercial Vehicle Security Practices: A Survey of State Enforcement Agencies* to the ITE District 9 (TexITE) Winter Meeting, Houston, TX, February 3, 2007.

Dr. Eyad Masad of Texas A&M University was a UTC panelist at the Highway Infrastructure Research and Technology Workshop in Washington D.C. on March 19, 2007.

Ms. Caitlin Uzzell graduate student from the University of Texas at Austin presented *Measuring the Sustainability of School Siting Policies Using Health Impact Assessment*, to the Society for Applied Anthropology, Tampa, FL, March 27-31, 2007.

86th Annual TRB Meeting Highlights

The following is a listing of SWUTC staff who presented study findings or participated in poster sessions based on their SWUTC research.

Ms. Ashley Haire and **Dr. Randy Machemehl** of the University of Texas at Austin presented *The Impact of Rising Fuel Prices on US Transit Ridership.*

Dr. Joe Zietsman from Texas A&M University presented Mobile Source Air Toxins from Idling Trucks: Report from Mexico Border.

Dr. Keith Knapp from Texas A&M University presented Deer-Vehicle Crash Research Summary Findings.

Mr. Rob Harrison, Mr. Nathan Hutson, Mr. Jason West and Ms. Julie Wilke of the University of Texas at Austin, presented *Characteristics of Drayage Operation at the Port of Houston*.

Dr. Susan Chrysler from Texas A&M University presented *Driver Comprehension of Diagrammatic Advanced Guide Signs and Their Alternatives.*

Ms. Debbie Jasek and Dr. Beverly Kuhn from Texas A&M University presented *Innovative Solutions to Transportation Needs in the Colonias.*

Mr. Abdul Pinjari and Dr. Chandra Bhat of the University of Texas at Austin presented Modeling Residential Sorting Effects to Understand Impact of the Built Environment on Commute Mode Choice. **Dr. Arif Chowdhury** from Texas A&M University presented *Evaluation of Recycled Tire Fibers as Reinforcement in Different Types of Asphalt*.

Mr. Sudeshna Sen and Dr. Chandra Bhat of the University of Texas at Austin presented Impact of Demographics, Built Environment Attributes, and Vehicle Characteristics on Household Vehicle Holdings and Use.

Dr. Chandra Bhat of the University of Texas at Austin presented *Population Synthesis for Microsimulating Travel Behavior.*

Dr. Fengxiang Qiao, **Mr. Richard Ge** and **Dr. Lei Yu** from Texas Southern University presented A Microscopic Framework to Develop Evacuation Plan for Multi-Institutional Center - A Case Study in Texas Medical Center.

Dr. Chandra Bhat and **Ms. Rachel Copperman** of the University of Texas at Austin presented *Effect of the Built Environment on Motorized and Nonmotorized Trip Making: Substitutive, Complementary, or Synergistic?*

Dr. Mark Burris and **Mr. S. Patil** from Texas A&M University presented *Examination of Genetic Algorithms to Predict Mode Choice.*

Mr. Aarti Kapur and Dr. Chandra Bhat of the University of Texas at Austin presented On Modeling Adults' Weekend Day Time Use by Activity Purpose and Accompaniment Arrangement.

Mr. Rob Harrison of the University of Texas at Austin, presented Inland Ports and Deep-Water Container Terminals: Mitigating the Gathering Storm?

Dr. Jorge Prozzi and **Mr. Runhua Guo** of the University of Texas at Austin presented *Reliability-Based Approach* for Using LTPP and APT Test Results for Estimating Fatigue Performance.

Dr. Keith Knapp from Texas A&M University presented Crash or Carcass Data: Critical Definition and Evaluation Choice.

Dr. Jorge Prozzi and **Mr. Feng Hong** of the University of Texas at Austin presented *Statistical Analysis of Highway Traffic in the U.S.-Mexico Trade Corridor Based on Highway Damage: Case Study in Texas.*

Dr. Keith Knapp from Texas A&M University presented *Development and Content of Strategic Agenda for Reducing Deer-Vehicle Crashes*.

Dr. Jorge Prozzi and Mr. Rong Luo of the University of Texas at Austin presented Effect of Measured Three-Dimensional Tire-Pavement Contact Stress on Critical Pavement Response.

Dr. Jorge Prozzi and **Mr. Feng Hong** of the University of Texas at Austin presented *Equivalent Damage Factors Based on Mechanistic-Empirical Pavement Design.*

Ms. Jennifer Duthie and Dr. Travis Waller of the University of Texas at Austin presented *Environmental Justice Analysis: Challenges for Transportation Planning.*

Dr. C. M. Walton of the University of Texas at Austin presented *State Enforcement Practices in Commercial Vehicle* Security: Advanced Technology Use and Inter-Agency Cooperation.

Mr. Bin Zhou and Dr. Kara Kockelman from the University of Texas at Austin presented *Predicting the Distribu*tion of Households and Employment: Seemingly Unrelated Regression Model with Two Spatial Processes. Mr. Jason Lemp, Mr. Bin Zhou and Dr. Kara Kockelman from the University of Texas at Austin presented Visioning Versus Modeling: Analyzing Land Use-Transportation Futures of Urban Regions.

Ms. Laura McWethy, Mr. Jason Lemp and Dr. Kara Kockelman from the University of Texas at Austin presented From Aggregate Methods to Microsimulation: Assessing the Benefits of Microscopic Activity-Based Models of Travel Demand.

TRB/SWUTC Poster Sessions

Dr. Fengxiang Qiao, Dr. Lei Yu and Ms. Linhua Li from Texas Southern University poster presentation of *Esti*mating Impact of Nonrecurring Congestion on Vehicle Emissions.

Ms. Alison Conway and **Dr. C. Michael Walton** from the University of Texas at Austin poster presentation of *State Enforcement Practices in Commercial Vehicle Security: Advanced Technology Use and Interagency Cooperation.*

Dr. Fengxiang Qiao, **Mr. Ziqianli Wang** and **Dr. Lei Yu** from Texas Southern University poster presentation of On-Road Vehicle Emissions in Beijing, China: Experimental Study Using Portable Emission Measurement System.

Dr. Jorge Prozzi and **Mr. Feng Hong** from the University of Texas at Austin poster presentation of *Statistical* Analysis of Highway Traffic in the U.S.-Mexico Trade Corridor Based on Highway Damage: Case Study in Texas.

Mr. Ampol Karoonsoontawong and Dr. Travis Waller from the University of Texas at Austin poster presentation of *Robust Optimization Model of Dynamic Continuous Network Design Problem*.

Education Highlights

SWUTC Sponsored Transportation Seminars

On February 8, 2007, the SWUTC sponsored guest speaker Dr. Shane Turner from Beca, a multi-disciplinary engineering consulting practice in New Zealand, to conduct a student seminar on the Texas A&M University campus. His presentation "Crash Prediction Modeling in New Zealand" discussed various modeling studies that have been completed in New Zealand by Beca, along with current and proposed research projects. Dr. Turner explained that generalized linear models have been developed for the majority of intersections and road links in New Zealand. And that these models have been used to assess the safety impacts of various road features including speed, visibility, crossing width for cyclists and traffic signal compliance rates for pedestrians. While these modeling methods were briefly outlined, the presentation focused on the outcomes and applications of the research. Some general data on crash trends in New Zealand were also presented.

On March 8, 2007, the SWUTC sponsored guest speaker Dr. Charles Beatty from the University of Florida to conduct a student seminar on the Texas A&M University campus. Dr. Beatty's presentation "Ductile Cement/Concrete and Related Materials: Nanotechnology Perspective" discussed his research on the use of nanoparticles replacing large rocks and how they might even out the stress discontinuities in concrete and the rock/ cement interface. Dr. Beatty stated that the initial research was surprisingly successful and continues to evolve. Shrinkage can be significantly reduced resulting in greatly minimized cracking. And an increase in tensile strength to about 1000 psi has been achieved and 2000 psi seems possible with the positive attendant implications with respect to applications in beams and structures.

Where Are They Now?

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

<u>University of Texas at Austin Graduates</u> Laura McWethy – Travel Demand Forecaster for Cambridge Systematics Isabel Victoria – Associate for Wilbur Smith Associates

<u>Texas A&M University Graduates</u> Glenn Anderson – Engineering Research Associate for Texas Transportation Institute Christopher DeBaillon – Graduate Engineer for Turner, Collie & Braden <u>Texas Southern University Graduates</u> **Tammye Davis** – Transportation Planner for FHWA **Juan Morrison** – Logistics Planner for the Red Cross **Jamal Schoby** – Transportation Planner for Houston METRO **Harry Fulwood** – Traffic Engineer for Calvin, Giordano and Associates, Inc.

Congratulations to the Following SWUTC Students for Awards Received

Ms. Rong Luo, Research Graduate Student for Dr. Jorge Prozzi at the University of Texas at Austin, was the recipient of the *Helene M. Overly Memorial Scholarship*.

Mr. Stephen Boyles, Advanced Institute graduate student at the University of Texas at Austin was the winner of the 2006 CUTC Milton Pikarsky Memorial Award for best MS thesis awarded during the 86th Annual Meeting of the Transportation Research Board in January.

Ms. Erin Eurek, Transportation Scholars graduate student at Texas A&M University was the winner of the TAMU/SWUTC Outstanding Masters Student Award presented at Texas A&M University in January.

Mr. Steve Schrock, Transportation Scholars graduate student and SWUTC researcher at Texas A&M University was the winner of the TAMU/SWUTC Outstanding Doctoral Student Award presented at Texas A&M University in January.

Mr. Stephen Boyles, Ms. Allison Conway, Ms. Rachel Copperman, Ms. Jennifer Duthie, Mr. Jeffrey LaMondia, Ms. Lauren Gardner, and Mr. Jason Lemp all Advanced Institute graduate students at the University of Texas at Austin were winners of Eisenhower Graduate Fellowships for 07-08.

Mr. Abdul Pinjai, Research Graduate Student for Dr. Chandra Bhat at the University of Texas at Austin and Ms. Rong Luo, Research Graduate Students for Dr. Jorge Prozzi at the University of Texas at Austin were selected to participate in the 2007 International Road Federation (IRF) Executive Leadership Program.

Technology Transfer Highlights

Recently Published Journal Articles Based on SWUTC Research

Y. Zhang Z. Ye and Y. Xie from Texas A&M University published <u>Estimation of Large Truck Volume Using</u> <u>Single Loop Detector</u> in the *Journal of Computer-Aided Civil and Infrastructure Engineering (CACAIE)* January 2007.

J. Duthie, K. Cervenka and S.T. Waller of the University of Texas at Austin published <u>Environmental Justice</u> <u>Analysis: Challenges for Transportation Planning</u> in the *Transportation Research Record*, 2007.

Recently Published Reports

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

Characterizing Truck Traffic in the U.S.-Mexico Highway Trade Corridor and the Load Associated Pavement Damage, Feng Hong, Jolanda P. Prozzi, and Jorge A. Prozzi, University of Texas at Austin, April 2007, 58 pp. (SWUTC #167555-1)

A Longitudinal Assessment of the Relationship Between Land Use, Land Values, and Bus Facilities, Gwen Goodwin and Carol A. Lewis, Texas Southern University, March 2007, 43 pp. (SWUTC #167620-1)

Assessing Driver Distraction Due to In-Vehicle Video Systems though Field Testing at the Pecos Research and Testing Center, Dillon Funkhouser and Susan T. Chrysler, Texas A&M University, March 2007, 55 pp. (SWUTC #473700-00082-1)

Can Transit Oriented Developments Reduce Austin's Traffic Congestion?, Ming Zhang and Chang Yi, University of Texas at Austin, October 2006, 33 pp. (SWUTC #167869-1)

Testing and Modeling of Truck Emissions While Idling, Lei Yu, Fengxiang Qiao and Fatemeh Soltani, Texas Southern University, September 2006, 68 pp. (SWUTC #167650-1)







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