SOUTHWEST REGION UNIVERSITY TRANSPORTATION CENTER

2008 ANNUAL REPORT

TEXAS A&M UNIVERSITY
UNIVERSITY OF TEXAS AT AUSTIN
TEXAS SOUTHERN UNIVERSITY

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Southwest Region University Transportation Center
Annual Report 2008

Transportation Solutions to Enhance Prosperity and the Quality of Life

Region Six UTC

In Memoriam

G. Sadler Bridges
(19 August 1934-16 April 2008)

G. Sadler Bridges, a founder of the SWUTC and long-time friend and colleague at the Texas Transportation Institute, died April 16, 2008. His career in transportation research and education spanned five decades and included conducting research projects in transportation economics; providing organizational management and leadership; and supporting development of professionals in transportation R&D.

Sadler Bridges received his Bachelors of Business Administration (BBA) and Master of Science in Economics from the A&M College of Texas. In 1964 after doctoral studies in economics at SMU, he returned to Texas A&M as an Assistant Professor on the Economics Department faculty and later acquired a joint research appointment as a transportation economist with the Texas Transportation Institute.

His research responsibilities included conducting TTI's studies of the economic influence of freight movements on Texas transportation networks, principally highways and railroads.

Subsequently, the Governor of Texas appointed Sadler to develop the State's contribution to the National Transportation Studies mandated by the U.S. Congress.

Following this effort, Sadler's successes at TTI included leadership of the Economics and Planning Division serving as TTI's Associate Director, and then Deputy Director. Among his many significant national and successful efforts were:

* A founding member of IVHS America which matured and became ITS America;
* Editorship of Mobility 2000;
* A founder of the consortium of TTI, Texas Southern University, and University of Texas to win a major federal grant which established the Southwest Region University Transportation Center.

Sadler also served as TTI's Interim Director in 1993 and was engaged subsequently in several TTI initiatives, including the nationally recognized ALERT program, which received an award and accolades from Vice President Al Gore.

In 2004, Sadler received the Charley V. Wootan Career Achievement Award, the most prestigious award given by TTI to its research professionals.

Following Sadler's retirement in August 2007, the Texas A&M Board of Regents honored his years of service to the Texas A&M System by appointing him as an Executive Associate Director Emeritus of the Texas Transportation Institute.

We in SWUTC are all better off for having Sadler Bridges with us as a colleague for a large part of his professional career.....and we miss him greatly.

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Message from the Director

Dock Burke
Director, SWUTC

As we enter our 20th year, I would like to emphasize a few items of significance to our SWUTC. First and foremost, we began with a consortium of three universities and were able to maintain and strengthen that structure during each renewal of our UTC charter. These three universities (Texas A&M University, Texas Southern University, and the University of Texas at Austin) that comprise the SWUTC have grown both as members of our consortium and as individual universities each with a robust transportation program. Because of the value-added by the synergy, we are better now than before...and will be better in the future as we re-invest the successes of our SWUTC consortium at:

Texas A&M University – Land-grant university established in 1876. Student enrollment 48,000. Transportation programs in Civil Engineering, Urban Planning, and the Bush School.

Texas Transportation Institute is a multi-disciplinary, multi-modal research agency since 1950. 2009 budget is $52.1 million.

Texas Southern University - An historically African-American university in Houston. Curriculum in Transportation Planning, Airway Science, and Urban Planning.

Center for Training Transportation and Research specializes in urban transportation.

University of Texas at Austin - Among the country's highly-ranked public research universities. Student enrollment 50,000. Transportation programs in Civil Engineering, Community and Regional Planning, and the LBJ School.

Center for Transportation Research is one of the prominent transportation research centers in U.S. -- $15 million current program.

Our Students

Successful students are primary "products" of our research and education programs. During the year, 140 students (undergraduate and graduate) participated in the research and educational programs of the SWUTC's consortium universities. Highlighted within this report are our student award winners, Mr. Xiugang Li winner of the *Robert Herman Outstanding Student Award*, Ms. Yasmina Soria, winner of the *Naomi Ledé Outstanding Master Student Award* and Dr. Nick Lownes winner of the *William J. Harris Outstanding Doctoral Student Award*. Also, SWUTC supports a vigorous outreach program, principally during the summer, to introduce youngsters (grade-school thru high school) to transportation concepts as potential career interests. These outreach programs involved 455 secondary school children during the year. Additional details about our students and their successes are inside this report, and I encourage your perusal.

Our Research and Teaching Faculty.

The faculty is the heartbeat of the SWUTC enterprise … vital, steady, and strong. Teaching and research efforts at all three universities have been the key to our enterprise's success for two decades. Inside this report, please find the numerous mentions of award-winning faculty member activities at each of the three universities and their affiliated research centers. Dynamic new professors and professional researchers, along with the "greybeards", populate our SWUTC faculty, both teaching and research. Cutting edge research and innovative classroom excellence are routine outcomes in SWUTC.

A sample of these follows and many more are included in detailed discussion later on in this report.

First, a SWUTC study directed by Mr. Rob Harrison at the Center for Transportation Research and the University of Texas at Austin was the topic of the UTC Spotlight published by USDOT/RITA in June 2008. Mr. Harrison reported the results of his detailed safety study of trucks crossing the U.S.- Mexico border into the State of Texas. Among the study results, RITA reported that "the finding that Mexican carriers outperformed U.S. carriers at most Texas border safety inspection facilities since 2003 challenges a central argument made by those wishing to keep the southern border closed on safety grounds. The results of this study have important implications for public debates allowing Mexican trucks into the United States."

Very recently, Dr. Carol Lewis and Dr. Lei Yu have been appointed as Director and Co-Director, respectively, of the National Center of Excellence for Petrochemical Transportation Security recently established at Texas Southern University. Dr. Lewis's work on emergency transportation response (funded by SWUTC) and Dr. Yu's work on traffic simulation (funded by SWUTC) were instrumental elements in the selection of TSU for this Center being funded by the U.S. Department of Homeland Security.

At TTI, Ms. Debbie Jasek has taken leadership responsibility for several SWUTC-supported elements in pre-college student outreach initiative. Web-accessible, this work includes development of educational modules and a Transportation Career Guide to introduce transportation careers to students in grades K-12. Ms. Jasek has been instrumental in developing and supplying transportation related materials for use in secondary school Science Fairs and workshops. Her current effort focuses upon outreach to girls in grades K-9 to introduce them to transportation concepts and careers. Appropriately, the title of this SWUTC project is Go Girl!

Our Challenge to ourselves

We in SWUTC intend our research, educational, and technology transfer programs to be sustainable at a high level of excellence. Throughout the U.S., but especially in Region 6, our challenge to ourselves is to be:

- the "place to go" when prospective students contemplate a transportation career,
- the "place to be" when transportation researchers and faculty members look for an improvement in their career opportunities,
- the "place to call" when transportation entities need objective information, innovative solutions, and top-notch graduates; and
- the "place to point to" when transportation agencies ask: Who should we try to get to undertake this critical and difficult responsibility?; and
- the "place to seek" for leadership and collegial partnership for all the UTC programs in Region 6.

Regards from us in Texas,

Dock Burke
October 31, 2008

Theme and Vision

The SWUTC theme

Transportation Solutions to Enhance Prosperity and the Quality of Life

challenges SWUTC participants to expand their capacities to the fullest to produce education, research, and service solutions to transportation issues facing the people of the Southwest and the U.S. Our theme encompasses four strategic thrusts - support of economic growth and trade; enhancement of mobility, accessibility and efficiency; promotion of safety and safe environments; and development of the transportation workforce.

To achieve maximum value from the SWUTC in implementing our grant, the SWUTC pursues the following vision to become

an internationally recognized center for excellence providing knowledge, diverse leaders, and innovative solutions for the transportation challenges of the 21st Century.

This ambitious vision calls upon us, over the expected lifetime of this UTC grant, to deliver premier research programs in transportation systems, transportation education and professional workforce development, and transportation technology transfer and service. We will pursue this vision by building on the significant resource base already in place within the transportation programs of the consortium universities, adding new partnerships and alliances with other universities and transportation entities in the region, and keeping the three program elements (research, education, and technology transfer) focused upon our theme.

The SWUTC Consortium

Since the establishment of the UTC program in 1988, the SWUTC consortium has included these members: Texas A&M University System, the University of Texas at Austin, and Texas Southern University.

Lead University - Texas A&M University System

The Texas Transportation Institute is headquarters for the SWUTC and is a premier transportation research center in the U.S. The research program at TTI is extensive and includes transportation systems and operations, policy and planning, economics, materials, structures, safety, and human factors.

Texas A&M University's transportation-related faculty -- composed of experts in transportation engineering, materials, and planning – prescribes the curriculum and requirements for undergraduate and graduate degrees with specializations in numerous aspects of transportation. Completion of these degrees creates engineers and scientists for professional careers and leadership positions throughout the transportation industry.

Texas Southern University

Texas Southern University and its Center for Transportation Training and Research present a varied transportation program in planning, research, and implementation that has focused upon some unique opportunities in providing transportation excellence to African-American populations of students and transportation users. A blend of TSU's airway science expertise and its strength in urban transportation planning creates new avenues for bringing multi-modal solutions into the classroom, laboratory, and implementation phases of existing and new transportation challenges for the 21st Century.

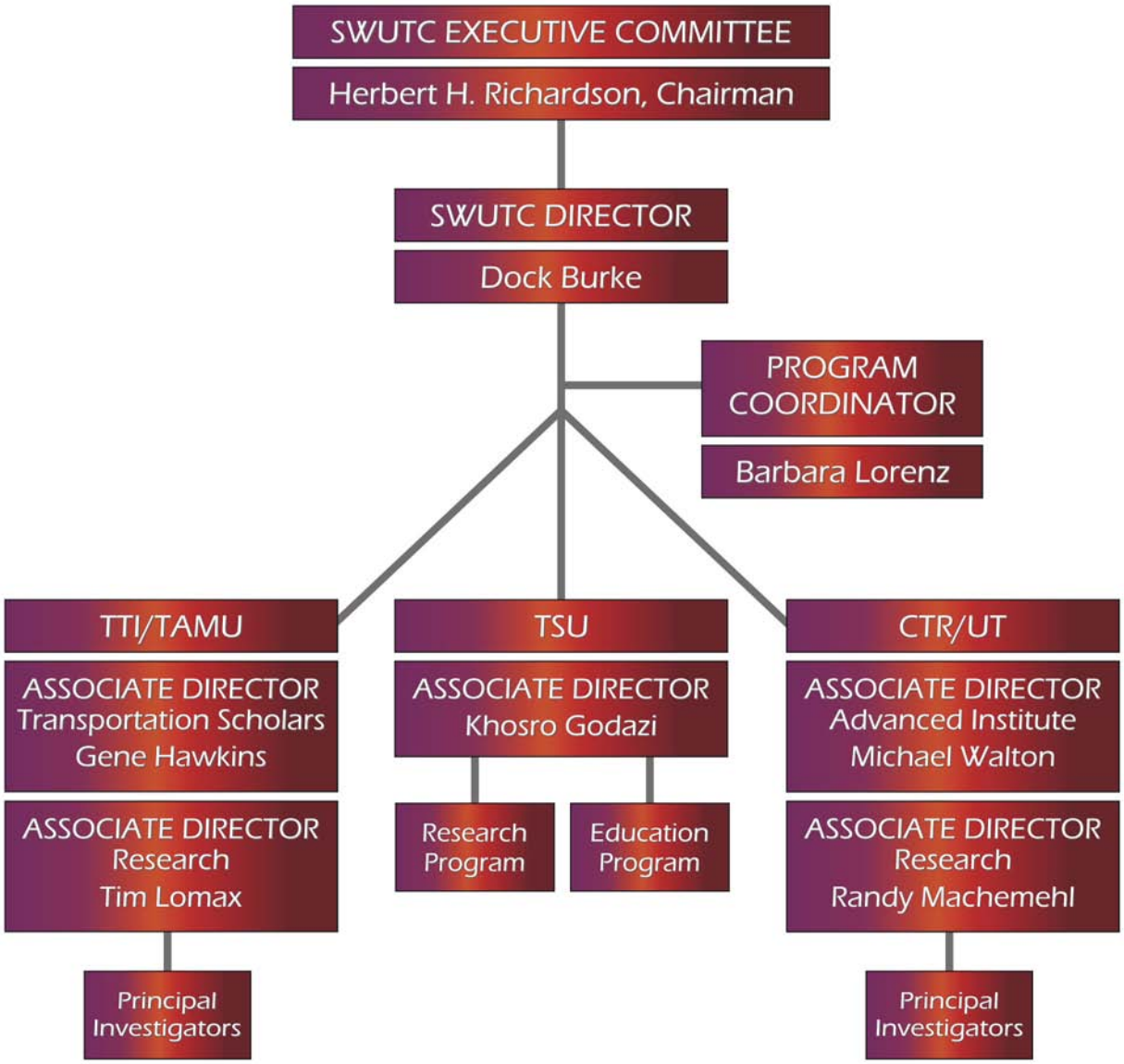
University of Texas at Austin

The transportation programs at the University of Texas at Austin and its Center for Transportation Research feature well-equipped facilities, top-notch research and teaching faculties, and high-quality students. A wide range of expertise in science, engineering, and policy gives the SWUTC a rich skill mix needed for developing viable solutions to complex issues involving transportation systems behavior, international goods movements, and harmonized modal transportation networks for improved performance, including a higher quality of life for the affected citizens.

Management Structure

The SWUTC Executive Committee oversees the SWUTC activities by establishing budget priorities; determining program content by selecting research projects and choosing those educational programs to be undertaken; and by reviewing the administrative affairs of the Center.

The SWUTC Director plans, executes, and reports the approved activities of the Center. The Director is assisted by a Program Coordinator and five Associate Directors - two at TAMU/TTI, two at UT-Austin/CTR, and one at TSU/CTTR. These Associate Directors are each responsible for administering that portion of SWUTC's activities in their charge.



Key Center Personnel

SWUTC Executive Committee

Dr. Herbert H. Richardson, chairman

Dr. Richardson is Chancellor Emeritus of the Texas A&M University System, Director Emeritus of the Texas Transportation Institute, and Distinguished Professor Emeritus of Mechanical Engineering, Texas A&M University.

A graduate of the Massachusetts Institute of Technology, Richardson served that institution as professor, Head of the Department of Mechanical Engineering and Associate Dean of Engineering before joining Texas A&M in 1984 as Dean and Vice Chancellor of Engineering. He served as Chancellor of the Texas A&M University System prior to becoming Director of the Texas Transportation Institute in 1993 where he served until 2006.

Dr. Richardson's areas of expertise include transportation systems and technology, system dynamics and control, fluid mechanics, design and fluid power control. He is a member of the National Academy of Engineering. He served for six years on the Council of the National Academy and the Governing Board of the National Research Council, and is a past Chairman of the Transportation Research Board. He has chaired and participated in numerous national committees of the National Research Council in areas such as Designing Safer Highways, Intelligent Vehicle-Highway Systems, Tank Car Safety, Future Strategic Highway Research and US Aeronautics Vision 2050.

Richardson's more significant honors include Honorary Member and Fellow, American Society of Mechanical Engineers; Fellow, American Association for the Advancement of Science; and recipient of the Rufus Oldenberger Medal (in dynamics and control) and the Pi Tau Sigma Gold Medal.

Dr. Dennis Christiansen, member

Dr. Christiansen is Director of the Texas Transportation Institute. Dr. Christiansen has been a member of the staff of the Texas Transportation Institute for over 30 years. Projects directed by Dr. Christiansen have addressed areas such as: the role of rail transit in Texas cities; roadway operations and design; transportation and energy relationships; the design and operation of bus transfer centers and park-and-ride lots; the role of intercity rail passenger service in Texas; the potential role for a system of strategic arterial streets; and urban goods movement. In addition to this research, Dr. Christiansen has become recognized as an international expert in the planning, design, operation and evaluation of preferential facilities for high-occupancy vehicles.

In 1979 he received the Transportation Research Board's Fred Burgraff Award. The International Institute of Transportation Engineers awarded him their Technical Paper Award in 1984 and the Technical Council Award in 1988. The Texas Section of the Institute of Transportation Engineers named him its Transportation Engineer of the Year in 1989. He is a past president of the

International Institute of Transportation Engineers and is currently one of the 15-member Board of Direction for IITE. Dr. Christiansen is past president of the Research and Education Division of the American Road and Transportation Builders Association and currently serves on ARTBA's Board of Directors. He also served as President of the Council of University Transportation Centers (CUTC) in 2002. In 2003 he received the S.S. Steinburg Award presented by the American Road and Transportation Builders Association. In 2003, Dr. Christiansen was awarded the Regents Fellow Service Award presented by the Board of Regents of the Texas A&M University System.

Mr. Rick Collins, member

Mr. Collins, is currently Director of the Research and Technology Implementation Office of the Texas Department of Transportation (TxDOT). In this capacity, he oversees and directs the development and operation of the Department's research, technology implementation, and new product evaluation programs.

He worked for a private engineering firm in Austin from 1985 to 1987. In 1987, he returned to the Department where he became the safety and programs engineer in the Traffic Operations Division. Mr. Collins served as the railroad liaison engineer from 1995 to 1997 and as the director of the Traffic Engineering Section from 1997 to 2004.

Mr. Collins represents TxDOT as a member of the American Association of State Highway and Transportation Officials (AASHTO) Research Advisory Committee and the state representative to the Transportation Research Board. He is also a member of the AASHTO Standing Committee on Research and serves on numerous National Cooperative Highway Research Program project panels.

Mr. Collins earned his bachelor's degree in civil engineering in 1981 from Texas A&M University and his master's degree in engineering from the University of Texas at Austin in 1988.

Mr. Robert Harrison, member

Mr. Harrison is a Senior Research Scientist and the Deputy Director of the Center for Transportation Research at the University of Texas at Austin. He has worked in the area of transportation economics and planning for over 30 years and has published extensively in the area of economic impact studies, trucking issues, cost benefit analysis and transport system planning. Recently, his work has focused on Texas-Mexico border trade issues and inland ports (which was started with seed money from the SWUTC), with both studies resulting in Texas Department of Transportation (TxDOT) Top Innovation Awards. In addition, he has studied NAFTA trade corridors and the major markets served by the Texas gulf ports. Mr. Harrison has written over 40 research reports and published over 30 peer reviewed technical papers, made presentations to senior U.S. Department of Transportation (USDOT) staff, and has given testimony at a number of Texas Senate hearings. Prior to joining the Center for Transportation Research in 1987, Mr. Harrison worked first as an academic in the United Kingdom, then as an economist for the United

Nations, and finally as a consultant to the World Bank.

Mr. Harrison is active within the Transportation Board (TRB). He is Chair of the Intermodal Freight Terminal Design and Operations committee, and a member of the committees on Motor Vehicle Size and Weight, International Trade and Transportation and Agricultural Transportation. He is a past president of the Transportation Research Forum (TRF) and currently serves as an associate editor of the TRF Journal.

Dr. H. Gene Hawkins, member

Dr. Hawkins is an Associate Professor in the Department of Zachry Civil Engineering at Texas A&M University, where he also serves as Division Head of the Transportation and Materials Division. He also holds a joint appointment as a Research Engineer with the Texas Transportation Institute (TTI). He joined the faculty at A&M in September 2004. Prior to that, he spent 18 years at TTI, where he supervised and conducted transportation engineering research. He received his Ph.D. in Civil Engineering from Texas A&M University in May 1993. He also holds Master of Engineering and Bachelor of Science (Cum Laude) degrees in Civil Engineering from Texas A&M University. Dr. Hawkins is a Registered Professional Engineer in Texas. Before joining A&M and TTI, Dr. Hawkins worked in the private sector for consulting firms in Bryan and Houston, providing services in the areas of general civil and transportation engineering.

Dr. Hawkins' primary field of interest is transportation infrastructure, with a special emphasis on traffic control devices, retroreflectivity, and visibility. He has been the PI or Co-PI on over 20 research projects with a total budget of $6 million. He has authored over 20 refereed journal papers on his research and has authored or co-authored over 70 research reports. Dr. Hawkins is a member of numerous professional and technical organizations. He is heavily involved in the efforts of the National Committee on Uniform Traffic Control Devices which provides recommendations on changes to the MUTCD. He is a member of the full National Committee, a member of the Executive Committee, chair of the Markings Technical Committee, and chair of the Institute of Transportation Engineers (ITE) delegation. In addition to his NCUTCD activities, he is a member of the Transportation Research Board (TRB), the Institute of Transportation Engineers (ITE), and American Society of Civil Engineers. Within TRB, he is the former chair of the Traffic Control Devices Committee and a member of the Signing and Marking Materials Committee and the Tort Liability and Risk Management Committee. He has served on several industry panels associated with infrastructure and traffic control devices.

Dr. Carol Lewis, member

Dr. Lewis is an Associate Professor in Transportation Studies and Director of the Center for Transportation Training and Research at Texas Southern University. She is responsible for educating students in fundamentals of transportation and urban transportation issues, as well as conducting operational and policy related transportation research. Lewis was recently named TSU's Principal Investigator for the Department of Homeland Security's National Transportation Security Center of Excellence for Petrochemical Transportation Security. Since 1992, she has conducted research for the Texas Department of Transportation (TxDOT) recently completing a study regarding regionalizing public transportation. Lewis' work for TxDOT also includes research about Smart Growth, Land Use and Development, Strategic Planning, and Land Value Effects of Elevated and Depressed Freeways. Dr. Lewis was the research supervisor for FHWA's Noise Compatible Land Use Brochure and workshop series on this topic. Her funded research also includes corridor feasibility studies for major Houston area freeway corridors, analysis of options to better manage freeway lanes and an assessment of the external influences on transit-oriented development.

Prior to joining Texas Southern University, Dr. Lewis spent 15 years as manager and director of planning at the Metropolitan Transit Authority of Harris County. She belongs to a number of professional organizations including the Transportation Technical Committee of the local Metropolitan Planning Organization and the Red Cross Transportation Advisory Committee. In 2004, Houston's Mayor Bill White appointed her to the Office of Mobility, an advisory function of the Mayor's Office and as Chair of the City's Planning Commission. At the suggestion of Mayor White, she was appointed to the Governor's Task Force on Emergency Evacuation following the 2005 hurricane season. Dr. Lewis served two years on the board of the Metropolitan Transit Authority as an appointee of, then, Houston Mayor Lee Brown and six years as the national academic advisor for the Conference of Minority Transportation Officials. Dr. Lewis holds a Ph.D. from the University of Houston in Political Science and M.A. and B.A. from the University of Iowa.

Dr. Eyad Masad, member

Dr. Masad is an associate professor in the Zachry Department of Civil Engineering at Texas A&M University. His primary area of research is characterization of asphalt mixes and aggregates. In the past five years, Dr. Masad has been the PI and Co-PI on projects with total funds that amount to approximately $3,000,000. He has published more than 80 technical journal papers on performance testing of asphalt mixes, modeling, and equipment development. Sponsors of his research include the National Science Foundation, National Cooperative Highway Research Program, Federal Highway Administration, Texas Department of Transportation, International Center for Aggregate Research, the Asphalt Institute, Washington State Department of Transportation, Idaho Transportation Department, as well as private industrial firms.

Dr. Masad is an active member of the American Society of Civil Engineers (ASCE), Association of Asphalt Paving Technologists (AAPT), and Transportation Research Board. He is also the chair of the pavement committee of the Geo-Institute, ASCE. He is a member of the techni-

cal advisory committee of the International Center for Aggregate Research (ICAR). He is the recipient of the Eisenhower Graduate Research Fellowship at Turner-Fairbank Highway Research Center for the year 1997, and the Faculty Eisenhower Fellowship in Transportation Engineering for the year 1998. He is also the recipient of the W. J. Emmons Award for the best paper published in the Journal of the Association of Asphalt Paving Technologists (AAPT) for the year 2001.

Dr. C. Michael Walton, member

Dr. C. Michael Walton is Professor of Civil Engineering and holds the Ernest H. Cockrell Centennial Chair in Engineering at The University of Texas at Austin (UT). In addition, he holds a joint academic appointment in the Lyndon B. Johnson School of Public Affairs. For more than 35 years he has pursued a career in transport policy and engineering analysis.

Dr. Walton is a member of the National Academy of Engineering. He is a past chair and member of the Transportation Research Board (TRB) Executive Committee. Currently he serves as chair of the TRB Subcommittee for the National Research Council (NRC) Oversight and ex-officio member of the Governing Board of the NRC. Recently he was elected chairman of the Texas Department of Transportation's "2030 Committee." The committee, comprised of experts in business and transportation, is coordinating a comprehensive update of Texas transportation needs through the year 2030. In other professional society affairs he is a past chairman of the board of the American Road and Transportation Builders Association (ARTBA) and a past member of the Board of Governors of the Transportation and Development Institute of the American Society of Civil Engineers (ASCE). In addition, he is a founding member of the Intelligent Transportation Society (ITS) of America and a past chair of the Board of Directors. He has served on or chaired a number of national study panels including those mandated by Congress and others of the NRC. Other professional or technical society memberships include American Society for Engineering Education, Institute for Operations Research and the Management Sciences, Institute of Transportation Engineers, International Road Federation, National Society of Professional Engineers, Society of American Military Engineers, and the Urban Land Institute.

Dr. Walton has received numerous honors and awards for his scholarly pursuits. Recently he was elected as a Distinguished Member of the American Society of Civil Engineers. In 2006 he received an Honorary Doctorate Degree from the Nagoya Institute of Technology. Dr. Walton received the Council of University Transportation Centers (CUTC) award for distinguished contribution to university transportation education and research. He received an Outstanding Projects and Leaders (OPAL) award from the American Society of Civil Engineers to recognize and honor lifetime excellence in furthering civil engineering education. In addition, Dr. Walton was named to America's Top 100 Private Sector Transportation Design and Construction Professionals of the 20th Century by the American Road and Transportation Builders Association. This honor recognizes "outstanding individual achievement, innovation and leadership in transportation design and construction." He received the 2000 George S. Bartlett Award in recognition for outstanding contributions to highway progress. He was selected by a Board of Award comprised of the President and Executive Director of each of the three sponsoring organizations—American Association of State Highway and Transportation Officials (AASHTO), TRB and ARTBA. The Bartlett Award is unusual in that it is the only award jointly sponsored by the three organizations and is considered to be among the highest honors in the highway transportation profession. The American Society of Civil Engineers noted the technical contributions of Dr. Walton by honoring him with several awards including the 1999 Francis C. Turner Lecture for contributions to transportation

research, education and practice, the 1992 James Laurie Prize for contributions to the advancement of transportation engineering; the 1987 Harland Bartholomew Award for contributions to the enhancement of the civil engineer's role in urban planning and development; and the 1987 Frank M. Masters Transportation Engineering Award, for innovations in transport facility planning. The Transportation Research Board presented Dr. Walton with the 1998 W.N. Carey, Jr. Distinguished Service Award which is among its highest honors in recognition of outstanding leadership in support of transportation research. In 1995, he was named TRB's Distinguished Lecturer in recognition of the research contributions over his entire career. The American Road and Transportation Builders Association presented Dr. Walton with the 1994 S.S. Steinberg Award recognizing his outstanding contributions to transportation education. The Institute of Transportation Engineers has awarded him the 1996 Wilbur S. Smith Distinguished Transportation Educator Award in recognition of outstanding contributions to the transportation profession by relating academic studies to the actual practice of transportation. He received the 1995 Distinguished Engineering Alumnus Award from the College of Engineering at North Carolina State University. The College of Engineering at The University of Texas at Austin awarded Dr. Walton the 1996 Joe J. King Award, their highest professional award, in recognition of his outstanding leadership to the engineering profession.

Dr. Walton has contributed to more than 250 publications in the areas of ITS, freight transport, and transportation engineering, planning, policy and economics, and he has delivered several hundred technical presentations. He has served as senior editor or contributing author for a variety of technical reference books and manuals and as a member of the editorial board for several international journals. Currently Dr. Walton has a research or consulting relationship with approximately 30 states.

Dr. Lei Yu, member

Dr. Yu is Professor and Chairman of the Transportation Studies Department at Texas Southern University. He obtained his Ph.D. degree in Civil/Transportation Engineering from Queen's University (Canada) in 1994, Master of Engineering Degree in Production and Systems Engineering from Nagoya Institute of Technology (Japan), and Bachelor of Engineering Degree in Transportation Management Engineering from Beijing Jiaotong University (China). During his tenure at TSU, he has been the driving force to improve its academic programs and develop advanced transportation laboratories. Under his leadership, TSU's transportation labs have successfully acquired top-end equipment such as full-motion driving simulator, mobile traffic van, portable emission monitoring system, and real-time traffic surveillance system through Houston TranStar. Dr. Yu has a wide spectrum of research interests and expertise related to highway traffic design and operations, Intelligent Transportation Systems (ITS), transportation planning and modeling, and vehicle emission modeling. In the past 11 years, he has served as the Principal Investigator (PI) for 35 projects sponsored by Texas Department of Transportation (TxDOT), Federal Highway Administration (FHWA), Southwest Region University Transportation Center (SWUTC), Houston Advanced Research Center (HARC), etc. Through these projects, he has established a solid knowledge base in the respective areas and gained extensive experience in project management skills. Dr. Yu is the author of over 120 research papers in scientific journals and conference proceedings, and 35 project reports. He is currently a Cheung Kong Scholar of Beijing Jiaotong University awarded by the Ministry of Education in China and Li Ka Shine Foundation in Hong Kong. Professionally, Dr. Yu is an active member of the Institute of Transportation Engineers (ITE), the American Society of Civil Engineers (ASCE) and the Transportation Research Board (TRB). He is registered engineer in the state of Texas.

Dr. Zhanmin Zhang, member

Dr. Zhang is an Associate Professor in transportation engineering at the University of Texas at Austin. He earned his B.S. degree in civil engineering from Chang'an University in 1983 and then joined the faculty of the University. After being a faculty member for 7 years at Chang'an University, he returned to graduate school to earn a Master's degree and Ph.D. degree in civil engineering from The University of Texas at Austin in 1993 and 1996 respectively. He joined the Center for Transportation Research (CTR) at The University of Texas at Austin as a Research Associate upon receiving his doctoral degree. Following four years of research work at CTR, he joined the faculty of the Department of Civil Engineering at the University of Texas at Austin in September 2000. His current research interests include: infrastructure systems analysis and management, behavior and performance simulation of pavements, large-scale database and information systems, application of advanced technologies, and intelligent infrastructure systems.

Dr. Zhang is a member of two technical committees of the U.S. National Academies' Transportation Research Board (TRB): ADF10-Pavement Management Systems and AFH30-Emerging Technologies for Design and Construction. He is also a member of the Infrastructure Systems Committee of the American Society of Civil Engineers (ASCE. He serves as a member of the Technical Advisory Panel for the Research Management Committee 1 (RMC-1) of the Texas Department of Transportation. In addition, he has recently served on the National Research Council's Committee on "Renewal of DOE Infrastructure" which served the U.S. Department of Energy (DOE) in developing and implementing a corporate strategy for intelligent renewal of its infrastructure.
Dr. Zhang is an author or co-author of more than 75 technical papers, reports, and articles. He serves on the Editorial Board of the journal of Transportation Research, Part C: Emerging Technologies. He has also frequently served as a technical reviewer for prestigious journals such as the Transportation Research, the Journal of Transportation Engineering, the Journal of Infrastructure Systems, and the Transportation Research Record.

New SWUTC Executive Committee Members for 2008

Dr. Melissa Tooley

Effective September 1, 2007, Dr. Melissa Tooley began serving as a member on the SWUTC Executive Committee. Dr. Tooley joined TTI in May, 2006 and is the Director of the University Transportation Center for Mobility (UTCM) at TTI. She is the former Director of the Mack-Blackwell National Rural Transportation Center (MBTC) at the University of Arkansas, and she served as an Assistant Professor of Civil Engineering at the University of Arkansas and the University of Florida. She has a decade of civil engineering consulting experience on projects involving roadway design, flood control, construction management, forensic engineering and civil infrastructure improvements.

Dr. Tooley is a past President of the Council of University Transportation Centers (CUTC) and ARTBA's Research and Education Division, where she

currently serves on its Board of Directors. She is a member of the Board of Regents of the Eno Transportation Foundation and is a former Eno Transportation Fellowship Recipient. A native of Little Rock, Arkansas, she was selected "Young Engineer of the Year" in 1995 by the Arkansas Society of Professional Engineers (ASPE). She serves on the Transportation Research Board Committee for Education and Training. Dr. Tooley was a Master's and Ph.D. level recipient of the Eisenhower Fellowship, sponsored by the Federal Highway Administration. As a graduate student, she was selected as MBTC's Student of the Year in 1994.

Dr. Talia McCray

Talia McCray is an assistant professor at the University of Texas in Austin. She specializes in transportation planning and accessibility challenges for low-income populations, who are often dependent on public transportation. Her research explores innovative data collection methodologies which capture the "why" of travel demand and unsatisfied demand. Her work has taken her to South Africa to model the socio-economic and environmental factors that affect prenatal care for women living in rural South Africa and to Quebec City, Canada, where she utilized GIS to organize and analyze data taken from focus groups and the self-mapping of individual space of low-income women, to better understand the challenges of using public transportation to access activities. Recent work includes studies that have both a research and outreach focus in analyzing the activity patterns of low-income youth in Providence, RI, and Austin, TX. The RI study sought to capture how youth experience their lives with respect to violence, and considered implications for their use of the city around them through tracking their activities. Current projects include designing transit mobility training programs for Austin youth and collecting GIS data on their perceptions and use of the communities in which they live. In addition the author has begun to explore the healthcare utilization patterns of low-income youth in Travis County.

Dr. McCray earned her Ph.D. from the University of Michigan, Ann Arbor, MI, in urban technological and environmental planning, specializing in transportation planning. Her MS is from Northwestern University, Evanston, IL, in electrical engineering. She graduated with high honors from Bennett College (BS mathematics) and North Carolina A&T State University (BS electrical engineering), both in Greensboro, NC. Dr. McCray teaches in the areas of transportation social equity, accessibility, healthcare planning, and general planning courses. Dr. McCray joined the SWUTC Executive Committe in May 2008.

Office of the Director

Dock Burke, Director

Dock Burke is the Director of the Southwest University Region Transportation Center at the Texas Transportation Institute. Currently a Senior Research Economist at the Institute, he has served as the Principal Investigator or Co-P.I. of 52 research projects, authored or co-authored 97 research reports and papers, and has made 75 presentations on a wide variety of transportation related issues since joining TTI in 1969. He is the 1998 recipient of the *TTI Career Achievement in Research* award and a 2003 recipient of the *Regents Fellow Service Award* presented by the Board of Regents of the Texas A&M University System.

SWUTC Administrative Staff:
Dock Burke and Barb Lorenz

Barbara Lorenz, Program Coordinator

Barbara Lorenz serves as Program Coordinator in the SWUTC, a position she has held since 1992. Ms. Lorenz oversees the daily operational activities of the Center. Ms. Lorenz, a graduate of Texas A&M University, has been employed with TTI for 30 years. She is the 2003 recipient of the *C.J. Keese Career Achievement in Administrative/Technical Support* award, which is TTI's highest award for excellence in administration.

SWUTC Associate Directors

Dr. Gene Hawkins, Associate Director - Transportation Scholars, Texas A&M University

(See bio on page 11)

Dr. Tim Lomax, Associate Director for Transportation Research at Texas A&M University

Dr. Lomax is a Research Engineer at the Texas Transportation Institute and Manager of the Mobility Analysis Program. He is internationally known for his research to quantify urban mobility problems and communicate his results to many different audiences. He has been active in devising practical mobility solutions employing both changes to practices and improvements in design and operations. He is a professional engineer and is a member of the Transportation Research Board, Institute of Transportation Engineers, Association for Commuter Transportation and American Society of Civil Engineers.

Mr. Khosro Godazi, Associate Director for Transportation Research and Education Texas Southern University

Mr. Godazi, Associate Director for the SWUTC, has 18 years of teaching and administrative experience at Texas Southern University. He holds a B.S. in Civil Engineering Technology and a M.S. in City Planning. He is Director of 4-week Texas Summer Transportation Institute that has been held in Houston, at Texas Southern University. In addition he spearheads the Transportation Studies Mentorship Program and directs the Transportation Club at the Middle College for Technology Careers which is a high school located in Houston. Mr. Godazi has coordinated numerous conferences for the Center for Transportation Training and Research and has extensive experience in transportation research. He has served as Principal Investigator on numerous SWUTC projects and has completed the Dwight David Eisenhower database software for FHWA. Mr. Godazi teaches transportation students in transportation software applications and quantitative statistics methods.

Dr. Randy Machemehl, Associate Director for Transportation Research at UT-Austin

Dr. Machemehl is the Director of the Center for Transportation Research and is the Nasser I. Al-Rashid Centennial Professor in Transportation Engineering at the University of Texas at Austin. In addition to these duties, Dr. Machemehl has distinguished himself as a researcher focusing particularly on transportation system operations and he has published over 200 papers and reports. His administrative positions have included service as the Associate Chairman of UT's Civil Engineering department. He is also a registered professional engineer, a registered professional land surveyor and has memberships in the Institute of Transportation Engineers, the American Society of Civil Engineers, the Canadian Society for Civil Engineering, National Society of Professional Engineers, the Transportation Research Forum and the Council of University Transportation Centers (CUTC). Dr. Machemehl is the current president of CUTC. He is a retired U.S. Army Reserve Corps of Engineers officer.

Dr. C. Michael Walton, Associate Director - Advanced Institute, UT-Austin

(See bio on page 12)

Education Program

Transportation Workforce Development

Transportation education is an essential element in the overall process of developing a workforce with the skills and leadership qualities to guide the transportation industry of the future. The SWUTC has invested heavily in the development of human capital creating a "pipeline" process which takes in students at secondary school levels, adds high school and baccalaureate programs and culminates in graduate specialities in transportation science and engineering.

The SWUTC supports the Transportation Scholars and the Advanced Institute Programs that are integrated into established degree-granting university departments at Texas A&M University and the University of Texas at Austin. Additionally, SWUTC supports the academic enrichment of a well-developed graduate transportation studies program at Texas Southern University. The SWUTC seeks to enhance these programs by strengthening the multidisciplinary qualities of a body of transportation science that will prepare today's students for leadership in the emerging information-rich economy.

SWUTC Pre-College Initiative Highlights

During the previous and current UTC grant, several self-sustaining programs have been developed that take transportation concepts to public schools to attract future transportation professionals. One early example was the development of **educational modules** that introduce careers in transportation for students in grades K-12. These modules developed for use in the classroom are still being downloaded by educators U.S. wide via the internet at http://tti.tamu.edu/groups/cpd/resources/presentations/index.htm. Another initiative was the development of **road-show promotional materials** for use at career fairs to encourage students to pursue careers in transportation. The success of this program is reflected in the fact that these materials are currently being requested by educators nationwide for use at various career fairs. These road-show promotional materials are available for free download at http://tti.tamu.edu/groups/cpd/resources/brochures/index.htm. Also available on this same website is the ***Transportation Career Guide*** developed in 2003 by SWUTC researchers. The *Transportation Career Guide* is a tool to help increase awareness of transportation as a profession to high school students and to help students set their career goals and objectives within the area of transportation. Another important success was the promotion of **transportation science at science fairs**. By the establishment of transportation specific categories, transportation science is now being promoted on a continuing basis at Texas science fairs along with meteorology, physics and other sciences. The **Go Girl!** program initiated in 2006 which provides one-day workshops for girls in grade levels K-9 to gain hands on experience and insight into what transportation, engineering, and technology careers offer. Go Girl! has developed into a sustainable, standing room only, yearly program. The award winning ***Recruitment Toolbox for Transportation Professionals*** developed in 2007 and available at http://ite.org/councils/Education/Recruitment/default.asp continues to provide fresh hands-on activity ideas to educators. Through these efforts and resources, SWUTC researchers are able, on a yearly basis, to introduce a vast number of K-12 students U.S. wide to possible careers in transportation.

2008 Texas Summer Transportation Institute Update

The SWUTC continues to support the Texas Summer Transportation Institutes held annually at Paul Quinn College in Dallas, and Prairie View A&M University in Prairie View, University of Texas at El Paso and Texas A&M Kingsville.

The Rural STI program at Texas A&M University Kingsville added during the summer of 2004 continues to be a success providing engineering career opportunities to mainly Hispanic students in rural Texas. This year 22 students participated in the two-week long program conducted in early June.

Rural STI Students Flying Tetrahedral Kites at TAMU-Kingsville

In addition, the well established four week Houston National Summer Transportation Institute conducted at Texas Southern University remains an award-winning program in the national STI initiative. This year 24 students participated in the Houston program. As part of the HNSTI a select group of these students are afforded the opportunity after the program is complete to be placed in internships with the Texas Department of Transportation or TSU. This year, due to budgetary shortfalls, TxDOT was not able to participate in the program. However, one student was placed in an internship at TSU. This program provides students with hands-on experience where they tackle important issues, make valuable connections within the transportation industry, and contribute to a project or program that can make a difference.

Each of these STI programs is based on the program design developed through the SWUTC and has the goal of creating an education and training delivery system that will: attract secondary students to and enhance their interest in careers in transportation; improve mathematics, science, communication and technology skills; and through creative partnerships, strengthen the links between the transportation sector and public/private institutions. Through the course of the program, all modes of transportation are addressed and augmented with hands-on technical activities, lectures by transportation professionals and field trips to such places as TxDOT District Offices, TranStar, TransGuide, Houston METRO, DART, VIA, HEB Regional Distribution Center in San Antonio, Port of Houston, Port of Corpus Christi, airport operation and maintenance facilities, and the Texas Transportation Institute research facilities.

The STI program continues to be a huge success and this year the SWUTC program helped sponsor 205, primarily minority, 9th -12th grade students. Historically, near 90% of these participating students go on to college with a majority indicating that they are currently pursuing careers in mathematics, science, business, technology and transportation engineering.

On the Move! Program Update

SWUTC Project #167164/P.I. Debbie Jasek

Initiated in 2007, and continued on in 2008, the *On the Move!* program is designed as a one-day workshop for students grade levels 5 through 9 and offers an opportunity to gain hands on experience and insight into what transportation, engineering, and technology careers have to offer. The program provides experiences to encourage interests in engineering, science, and math. It also offers exposure and mentor-

ing from role models that currently work in the transportation field. By providing a venue that allows students to recognize their interests in math and have an early successful experience, two of the crucial factors to encourage careers in technology and engineering are fulfilled.

Over the past two years, a total of eight separate events were piloted to diverse audiences across Texas. Each event created using a slightly different approach for sparking students' interest in science, technology, engineering and mathematics (STEM). All of the events were produced at a cost of less than $1,000 and all of the events were well attended and well received. A total of 1,175 students participated in the initial *On the Move!* outreach events and over 3,400 other students were reached through On the Move! career fair and science night events. Almost all of these events have continued to be replicated through other funding sources.

The most successful replication of an *On the Move!* outreach event has been the "Science and Math in the Real World" program that has been incorporated into the Gulf of Mexico Foundation's Eco Week along the Texas Coast. A total of two of these events have been held and an additional five programs are scheduled for the 2008-2009 school year. The South Texas Nuclear Project, Valero Refining, and Cheniere Energy have agreed to be corporate champions for the coming school year. The Gulf of Mexico Foundation is exploring avenues for funding that will expand the program to other Gulf Coast States and Puerto Rico.

The types of events conceived through this project are highly popular with students, teachers, and corporate entities. These events are easily replicated and adjusted to fit the needs of any area. They can also be produced with relatively small amounts of funding. It is important to remember in creating an event that the main objective is to create a fun and exciting event that introduces students to role models in STEM, help them recognize their abilities in science and math, and to expose them to transportation and engineering as career choices. Repeated exposure in informal settings such as the *On the Move!* events often do create the spark that determines whether a student will be successful in STEM and possibly choose that career path.

New Pre-College Initiatives for 2008

Effectiveness of Previous Outreach Programs Analyzed

SWUTC Project #167175/P.I. Debbie Jasek

Over the past nine years, the Southwest Region University Transportation Center, the Federal Highway Administration Office of Civil Rights, and other entities have sponsored numerous outreach programs throughout Texas for students from diverse populations. These programs include the *Summer Transportation Institutes* in Texas, *Go Girl!*, *On the Move!, Career Exploration*, the *Rural Transportation Institutes*, and *Students from Nontraditional Backgrounds*. Many of these students are either currently attending a university or beginning their college careers. This project led by **Ms. Debbie Jasek** of Texas A&M University, conducted a follow-up study to determine the status of these students and to document whether and where they are attending college as well as their course of study.

The survey was mailed to Summer Institute attendees of the past 10 years. A total of 411 surveys were mailed and approximately 40 percent of the attendees have either responded or the survey returned for unknown address. "The responses have been simply amazing,", stated study supervisor Debbie Jasek. "So

far out of all the responses I have gotten, everyone is either in high school or graduated (no drop outs) and all except one of those who have graduated have gone on to college. About 40 percent are crediting the program with either making the decision to attend college or their choice of major."

Project Produces *Glossary of Transportation Handbook* for High School Students

SWUTC Project #167371/P.I. Khosro Godazi

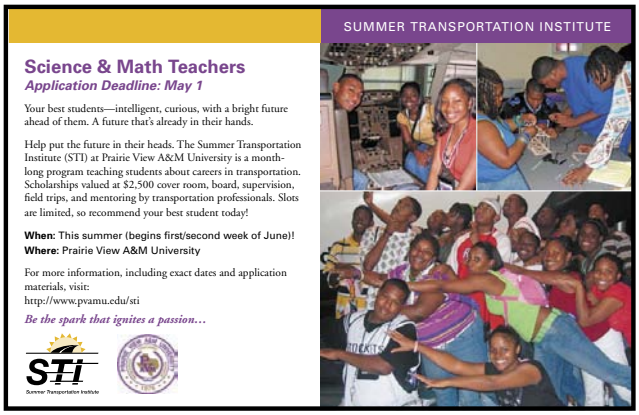
As part of a broader research effort, study supervisor **Mr. Khosro Godazi** of Texas Southern University developed a *Glossary of Transportation Handbook* to assist high school attendees of such events as the summer STI programs to become more familiar with the terminologies used in the transportation field. During the summer 2008 session of the Houston National Summer Transportation Institute (HNSTI), Mr. Godazi asked each speaker to provide terminologies that they would use during their session. The idea was to come up with something that would interest the students for the session and motivate them to interact with the speakers. After reviewing the terms submitted, the research team shared the list with experts in science and transportation for their comments. A finalized handbook was developed for use during the 2008 HNSTI program. Each student was provided a handbook and asked to review each section before attending a specific session.

The outcome exceeded expectations as the interaction between the speakers and students in the classroom was more interesting and active than previous years. The student's vocabulary improved and the interest they showed for the field of transportation was enhanced. The research team is convinced that such products as this handbook provide an important additional recruitment tool to attract more high school students to the field of science and transportation.

SWUTC Effort Produces New Recruitment Tools for STI Program at PVAMU

SWUTC Project #473700-00094/P.I. Michelle Hoelscher

2008 marks the ninth anniversary of the Summer Transportation Institute (STI) at Prairie View A&M University (PVAMU), College of Civil and Environmental Engineering. While the program has been successful in recruiting participants, there is a need to expand current recruitment and marketing strategies in order to increase the perceived value of the program and broaden the applicant pool.



This SWUTC initiative, led by **Ms. Michelle Hoelscher** of Texas A&M University, developed a promotional postcard and brochures, identified target audiences, and outlined the phased approach to meet the recruitment goals established by PVAMU. For more information on the program and to download recruitment brochures, visit http://www.pvamu.edu/sti.

Student Profile in Success: Sarah Benavides

At 16, **Sarah Benavides** demonstrated an aptitude for math. So she was asked by her Falfurrias, Texas, high school counselor if she wanted to attend a two-week program called the Summer Transportation Institute (STI). The high school sophomore reluctantly agreed, even though she knew it was geared toward identifying possible engineering students. After all, she was going into communications.

During the program held on the Texas A&M University-Kingsville campus, something life changing happened. "I found myself very impressed with something I never considered before," she recalls. "My eyes were opened to a possible career in engineering. It really did change my life."

Sara Benavides (on right) at the Rural Summer Transportation Institute in Kingsville, Texas

After high school, Sarah became a civil engineering student at Texas A&M University-Kingsville. She was hired by the coordinator of STI (Debbie Jasek) to work on another SWUTC outreach program, this one called *Go Girl!* "I was the *Go Girl!* camp counselor/director for the middle school-aged girls," she said. "I had a unique perspective because I was in charge of making engineering fun for them. It was easy because I was able to see through their eyes. I was in their shoes when I was 16."

Sarah graduated with a civil engineering degree in December 2007. That was on a Friday. On Monday, she started her career as an engineering assistant with the Texas Department of Transportation in the Corpus Christi District Office. "It's funny how things turn out," Sarah said. "Years ago, I had no idea I would become an engineer. I know that without my high school counselor or the outreach programs from the SWUTC, it wouldn't have happened."

2008 SWUTC Higher Education Highlights

SWUTC Summer Undergraduate Fellows Program

The SWUTC Summer Undergraduate Fellows Programs at the University of Texas at Austin and Texas A&M University continue to be extremely successful recruiting endeavors to attract a diverse group of students into the graduate programs in transportation. Each year, the Summer Undergraduate Fellows Program recruits undergraduate juniors and seniors from other universities and from diverse academic backgrounds into a summer-long program in transportation research and education as a first step towards graduate study in transportation. The students at both UT-Austin and TAMU have the opportunity to work with researchers and gain exposure to many different areas of transportation

TAMU-UG Fellows Students Tour Harris County Toll Road Authority Facility in Houston, Texas

research. Students make field trips to various transportation agencies and attend professional meetings such as the summer meeting of TexITE. At the end of the summer term, the students make presentations on their research and produce a paper for publication. During the summer 2008 session, 6 undergraduate fellows participated in the program at TAMU, 7 participated in the UT-Austin program.

The Summer Fellows Program has historically achieved a near 100% retention of undergraduate students into the graduate programs of transportation engineering.

SWUTC Advanced Institute and Transportation Scholars Programs

The SWUTC continues to support graduate programs at each of the three consortium member universities. The ultimate goal of the SWUTC graduate programs is to attract a highly qualified cadre of new professionals into transportation science. The Transportation Scholars Program at Texas A&M University, the Advanced Institute at the University of Texas at Austin and the graduate program at Texas Southern University provide stipends to students to participate in classroom and sponsored research activities. In addition, the program provides increased communications skills as students make presentations, participate in debates, write proposals and reports. Students also participate in technical tours and professional meetings throughout the year. This year, graduate students from Texas A&M University and the University of Texas at Austin attended and participated in the Transportation Research Board's 87th Annual Conference in Washington, D.C., in January. While attending the meeting, many of these student gained valuable experience while presenting papers based on their SWUTC research work.

TAMU Transportation Scholars Students Touring City of Austin Traffic Management Facility and Emergency Operations Center

For the 2008 program, 19 graduate students participated in the TAMU program, 23 in the UT-Austin program and 10 at TSU.

New Graduate Course in Transportation Policy and Politics Developed

SWUTC Study #167176/P.I. Eric Lindquist

It is increasingly important for young transportation professionals to be familiar with policy and political issues and processes relevant to their fields. At this time, there are no course offerings at Texas A&M University covering transportation policy and politics. A new course being developed by **Dr. Eric Lindquist** of the George Bush School of Government & Public Policy at Texas A&M University will provide additional insight into problems and opportunities facing transportation professionals in all levels of government and private practice. This course is based on research by Dr. Lindquist which systematically assessed the market for a graduate level course in transportation policy and politics at TAMU, is developing relevant materials for such a course (syllabi and reading lists), and will provide recommendations for implementing this course for the Spring 2009 semester.

STUDENT AWARDS

SWUTC's Student Award Winners

Each year, in addition to selecting the overall SWUTC Outstanding Student to represent the SWUTC at the CUTC banquet, 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 *Naomi Ledé Outstanding Masters Student Award*, the *William J. Harris Outstanding Ph.D. Student Award* and the *Robert Herman Outstanding Student Award* - comes with a $1,000 cash award.

Robert Herman Outstanding Student Award

Mr. Xiugang Li is a PhD student in the Zachry Department of Civil Engineering at Texas A&M University and a fellow in the Transportation Scholars Program of the Southwest Region University Transportation Center (SWUTC). A registered Professional Engineer in the State of Louisiana, Mr. Li has a Doctor of Highway Engineering (D.E.) from Southeast University in Nanjing, China. Prior to coming to Texas A&M, he served as an Adjunct Assistant Professor at Southern University in Baton Rouge and also a Postdoctoral Research Associate at Texas Southern University, a consortium member of the SWUTC.

A student member of ASCE and ITE, Mr. Li has research interests in transit, traffic operations, air quality, and highway safety analysis. He has published more than 20 journal and conference proceedings papers in these areas. Currently he serves as a Research Associate on a SWUTC project "Performance Assessment and Comparison between Fixed and Flexible Transit Services for Different Urban Settings and Demand Distributions".

Mr. Li is a supremely dedicated individual with outstanding academic and research capabilities. His future career as a researcher/teacher in transportation will extend and improve upon the high quality of contributions he has already made to our profession. Mr. Li's major professor at Texas A&M University is Dr. Luca Quadrifoglio. Mr. Li was selected to represent the SWUTC at the annual UTC Outstanding Student of the Year Awards ceremony during TRB's Annual Meeting in January, 2008.

Naomi Ledé Outstanding Master Student Award

After graduating *Cum Laude* with a Bachelors of Science degree from Embry-Riddle Aeronautical University, **Ms. Yasmina Soria** enrolled in the graduate program of the Department of Transportation Studies at Texas Southern University in the fall of 2006 and immediately impressed her professors with her high quality academic work, and her energy, focus, enthusiasm and attention to detail that she applies to each assignment. While excelling academically at TSU, Ms. Soria was also contributor to several Center for Transportation Training and Research (CTTR) research efforts through conducting literature reviews, data collection and surveys. Her specific research efforts include safe routes to school, communication options during emergency events, runway

incursions and currently helping with a public transportation project in south Texas.

Ms. Soria participated in an internship during the summer of 2007 with the Association of Airline Pilots in Washington D.C. She also submitted a research paper to a major aviation organization and gained recognition for its submittal. She has impressed those in the aviation profession and has been asked to participate in an upcoming panel based on her past contributions. Ms. Soria's commitment to the aviation profession is evident in the number of professional credentials that she holds, and the number of academic and leadership scholarships and awards she has acquired. She also volunteers with the *TSU Flight Team* and recently assisted with the *Wings Over Houston Air Show*.

Ms. Soria was selected for the Ledé Award in recognition of her academic commitment, outstanding skills and stellar accomplishments. Her major professor at TSU is Dr. Carol Lewis.

William J. Harris Outstanding Doctoral Student Award

Dr. Nicholas E. Lownes began his academic career at the University of Texas at Austin in August of 2003 in pursuit of both a master's degree and Ph.D. His years in Austin followed those spent at Iowa State University where he earned his bachelor's of science degree in civil engineering and two years spent at Fort Polk, Louisiana as a consulting engineer to the United States Army.

While pursuing his advanced degrees at the University of Texas, Dr. Lownes undertook several demanding research assignments. His final research effort funded by the SWUTC "The Commuter Rail Circulator Network Design Problem: Formulation, Solution Methods, and Applications" produced an innovative, very useful optimization tool that made a significant contribution to the state-of-the-art. This work has also led to several presentations and scholarly papers that are currently in review.

Through his participation in the student chapters of the Institute of Transportation Engineers, ITS America and the American Society of Civil Engineers, Dr. Lownes' resolve was strengthened to acquire a position upon graduation where he could be instrumental in recruiting and training the next generation of transportation professionals.

After receiving his Ph.D. in August 2007, Dr. Lownes accepted a position with the University of Connecticut as an assistant professor of transportation engineering where he is currently teaching undergraduate engineering statistics and economics, developing a graduate-level transportation network analysis course and advising two graduate students. He is also engaged in the development of a transportation lab in conjunction with the Center for Transportation and Urban Planning (CTUP), and preparing for the new National Center of Excellence of Transportation Security at UConn.

Dr. Lownes' major professor while at the University of Texas was Dr. Randy Machemehl.

SWUTC Graduate Student Achievements

Jennifer Duthie, Advanced Institute student supervised by Dr. Travis Waller at the University of Texas at Austin, received the *2007 Ann Koby Legacy Scholarship* presented by the Heart of Texas chapter of Women's Transportation Seminar (WTS). Local winners were submitted to International WTS to compete for scholarships at that level and Jennifer also won the Ann Koby Legacy Scholarship at the International level.

Ricardo Aitken and **Stephen Boyles**, both Advanced Institute graduate students at the University of Texas at Austin, each received a $1,000 ITS Texas Scholarships for Graduate Study in Intelligent Transportation Systems at the ITS Texas 2007 Annual Meeting on November 17th.

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."

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.

University of Texas Advanced Institute student, **Tara Snell** (supervised by Dr. Randy Machemehl) received the *2008 Outstanding Student Award*, which was awarded by the Texas Institute of Transportation Engineers to recognize the outstanding student member of the TexITE Student Chapter at UT-Austin.

Armin Kheirmand and **Kamarah Scott**, both SWUTC research and education program graduate students at Texas Southern University, on their being selected to receive Eisenhower Fellowships.

University of Texas Advanced Institute students **Stephen Boyles**, **Alison Conway**, **Rachel Copperman**, **Jennifer Duthie**, **Lauren Gardner**, **Jeffrey LaMondia**, and **Jason Lemp**, received *2007 Eisenhower Graduate Transportation Fellowships*, which were awarded by the National Highway Institute, Federal Highway Administration.

Former Advanced Institute Graduates Return to Guest Speak

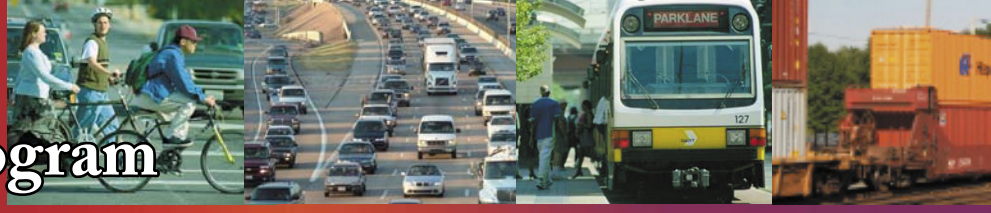
Mr. Justin Winn of Wilbur Smith Associates and a 2005 graduate of the SWUTC Advanced Institute Program at Texas A&M University returned to campus on October 2nd to make a presentation to the student chapter of the Institute of Transportation Engineers. In his presentation entitled "Using Tolls to Fund New Roadways and Estimation of Toll Revenue", Mr. Winn discussed various traditional roadway funding methods, including roadway user fees and revenue from motor fuel taxes. He then analyzed why these traditional methods are becoming less feasible. Following this discussion, he introduced two roadway funding methods based on tolls. These methods are 1) traditional toll road funding and 2) public-private partnerships. For traditional toll road funding method, agencies issue bonds to finance roadway construction. While for public-private partnerships method, private companies pay for construction

through loans, bonds, and so on. Mr. Winn also discussed in detail how these two methods work, their pros and cons and examples of these two methods.

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 utilized 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.

Research Program



SWUTC pursues a balanced program of transportation research (transit, highway, and multimodal) by selecting those projects that reflect our vision, theme and strategic thrusts. Some of the specific research program sub-themes are: improved linkages between the U.S. and Mexican transportation systems, developing transportation solutions to improve the livability of our neighborhoods and communities and the quality-of-life for their inhabitants, development of transportation-based solutions to various infrastructure, environmental, and safety problems, and development of a superior transportation workforce for the 21st Century. For a listing and description of new, on-going and completed research projects please visit our website at http://swutc.tamu.edu/research.htm.

Selected 2008 Research Highlights

Enhancing Mobility

Research Effort Analyzes Rising Fuel Cost Effect on Transit Ridership

SWUTC Project #167273/P.I. Randy Machemehl

In the summer of 2005, when gasoline prices first began rising rapidly to unprecedented levels, **Dr. Randy Machemehl** at the University of Texas at Austin and one of his Advanced Institute graduate students, **Ms. Ashley Haire**, began speculating about the impacts of fuel prices on automobile users, and to what actions their potential reactions may lead, including the hypothesized positive effects on public transportation use. Accordingly, to satisfy their intellectual curiosity, the SWUTC research team began investigating the trends in transit ridership in large, historically auto-oriented cities with substantial public transportation systems in place, believing that the effects would first be seen in such cities. This initial research showed statistically significant relationships between fuel price and ridership growth, particularly in bus and heavy rail modes.

Source: City of Guelph

In the ensuing three years, the original research hypothesis became more assuredly true and the strong relationship between fuel price and transit ridership has now spread across the country to all types of systems—for example, more than 75% of US bus systems now show positive correlation between these variables. The relief provided by public transportation to those coping with high gasoline prices has been widely recognized in recent media coverage, bringing transit to the forefront of community cohesiveness. As fuel prices have risen to record levels, so has national public transportation patronage, and managing this burgeoning growth is essential to maintaining acceptable service levels and retaining both new and old passengers.

To this end, the research team is now working to develop operational planning tools to aid transit planners in anticipating, planning for, and managing ridership growth due to general growth trends and those

due to fuel price fluctuations. With the limited funds available to transit agencies, allocating those funds in the most cost-effective manner is imperative, and the tools resulting from the current research will help planners provide the best service possible.

Promoting Transportation Solutions for Communities

This past year, the SWUTC undertook 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.

Transit Services for Sprawling Areas with Relatively Low Demand Density: A Pilot Study in the Texas Border's *Colonias*

SWUTC Project #167177/P.I. Luca Quadrifoglio

The first research effort, conducted by **Dr. Luca Quadrifoglio** at Texas A&M University examined 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. This study conducted a pilot study in selected communities on the Texas border to collected demand data and assess the appropriateness and feasibility of flexible transit for these areas.

Source: El Paso County Transit

Transportation for Humanity: Meeting the Needs in the *Colonias*

SWUTC Project #167178/P.I. Beverly Storey

The second study, conducted by **Ms. Beverly Story** at Texas A&M University, focused on providing personal or private vehicles instead of public transportation. There were 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. The research assessed and documented innovative, affordable, and cost-effective methods for meeting some of the unique transportation challenges facing residents of the *colonias*.

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

Global Connectivity

A Scoping Study of the Impacts of Bioenergy and Alternative Fuels on the Southwest Region's Economy and Transportation Infrastructure

SWUTC Project #167271/P.I. Leigh Boske

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.

Source: TTI/TAMU

This scoping study conducted by **Dr. Leigh Boske** at the LBJ School of Public Affairs at the University of Texas at Austin, inventoried renewable energy alternatives and assessed their impact on the Southwest region's transportation sector. Biofuel transportation requirements and domestic/international supply chains were illustrated. The research findings described a variety of potential solutions, including technologies currently commercially available and those still in a research phase. However, biofuels constituted the focus of this research given the current level of development and potential to impact the Southwest in the near term.

The world's primary producers of ethanol are Brazil and the United States. These two nations employ different methods to manufacture the fuel from separate crops. Brazil utilizes sugarcane whereas the United States employs corn. A four parameter comparison focusing on the energy budget, carbon emissions reduction, land use, and production costs of each biofuel type strongly suggests Brazil's fuel is superior to the American derivative. Case studies conducted by this research illustrated how ethanol would reach Texas markets depending on whether the biofuel originated in American corn fields or the Brazilian cerrado.

Additional discussion cited Texas' limited ability to grow existing commercial biofuels locally. However, the Southwest region holds greater promise as a producer of next-generation alternatives still undergoing laboratory evaluation.

Analysis of the Texas 2002 Safe Routes to Schools Program

SWUTC Project #167362/P.I. Gwen Goodwin

Over the past three decades, the number of children that walk to school has steady declined; however, instances of childhood obesity has steady increased. Researchers found that many factors influenced why children did not walk to school. In fact, surveys from parents in the Northside School District in San Antonio, TX indicated that their major concerns involved unsafe or hazardous walking conditions and chose to drive their students to school. This research conducted by **Ms. Gwen Goodwin** at Texas Southern University analyzed TxDOT's SR2S 2002 program and how the program will be affected with the passage of SAFETEA-LU.

Source: City of Mesquite, 2007

The Texas Education Code requires all school districts to transport children who live within two miles of a school if hazardous conditions exist. Ultimately, each school district's board is responsible for determining what they define as a hazardous condition. Ms. Goodwin found that students frequently were forced to walk in steep ditches/drainways, in the right-of-way, and along traffic moving at speeds up to 50 mph because no sidewalk was available. TxDOT's 2002 SR2S program funding to alleviate hazardous conditions in school zones was reserved for infrastructure projects only. Educational materials and other awareness activities promoting good health were not allowed. In addition, local government's policy only designated school zones near elementary and middle schools because younger and smaller children lacked the cognitive skills to negotiate traffic. However, this decision left high schools vulnerable and led to major accidents and even fatalities for high school children.

With the passage of SAFETEA-LU, the first notable improvement in the SR2S program eliminates the matching funds requirements. At times, identifying matching funds may be difficult for smaller cities/counties to do. This change may encourage more schools, non profits, and smaller cities to participate in the program. Another change makes non-infrastructure and educational activities eligible for funding; this allows for creative opportunities to improve the overall health of school aged children.

While most changes were beneficial, some program guideline changes may be problematic. Previously, city or county governments submitted the SR2S application on behalf of the school district. The new procedure allows school districts to apply directly to TxDOT for funding, instead of being a third party recipient. This may curtail city/school district partnership opportunities. Finally, new program guidelines still leave older students vulnerable. Current SR2S program participation is still limited to grades K-8. TxDOT officials anticipate that the new federally funded program will build on the efforts of the 2002 program by enhancing infrastructure and also promoting activities to improve the overall health of children while providing a safer route to school.

An Inventory and Assessment of Models Used to Predict Emergency Evacuation

SWUTC Project #476660-00041/P.I. Carol Lewis

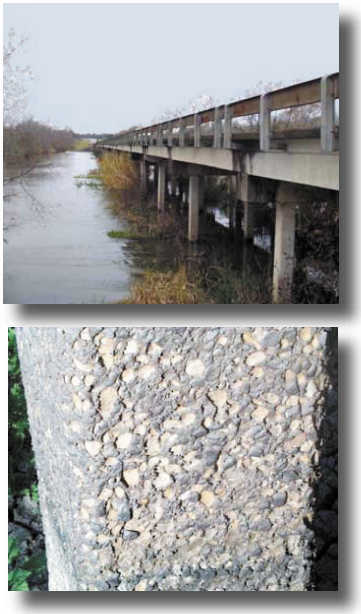
Source: TTI/TAMU

Evacuations from Hurricanes Katrina, Rita and Wilma in 2005 illuminated the issues of evacuating large numbers of residents via urban areas roadways and public transportation systems. Problems arose from people not observing the designated evacuation zones and protocol. This was particularly acute in the Houston area when large numbers of residents of that city failed to wait the exiting of people from Galveston Island and other coastal communities. Consequently, the roadways were clogged inland and residents in extremely high risk areas were not able to leave. Of note during Hurricane Katrina, was the number of individuals without automobile availability, who had no transportation to evacuate once warnings were issued. Texas' Governor Rick Perry initiated a Task Force in the fall of 2005 to evaluate the occurrences of the Hurricane Rita experiences and make recommendations. The four focal areas were: 1) Command, Communication and Control, 2) Fuel Availability, 3) Traffic and Transportation and 4) People with Special Needs (anyone who can not self-evacuate). Much work has occurred to improve evacuation times and experiences when the need to evacuate occurs again. Unanswered questions remain, however, including how long will it take to evacuate "x" number of individuals under a given set of circumstances. A number of models exist that purport to forecast evacuation volumes under a variety of scenarios. In this SWUTC study, **Dr. Carol Lewis** of Texas Southern University conducted a review of these models and their potential application. The findings of this research will benefit a number of communities still making decisions about the best methods and routes for evacuation.

Protecting the Built Environment

Analysis and Assessment of Microbial Biofilm-Mediated Concrete Deterioration

SWUTC Project #476660-00008/P.I. David Trejo



View of Bridge and Close-up of Deteriorated Column
Source: K. Pruski, TxDOT

The Texas Department of Transportation constructs many concrete structures; in fact, the large majority of bridges in Texas are made of some type of reinforced concrete (i.e., convention cast-in-place, prestressed, etc). Over the past several years, structural deterioration has become a critical issue affecting the entire transportation infrastructure network. It has been observed that the loss of structural capacity with time is caused mainly by chloride ingress, which leads usually to steel corrosion (loss of effective cross-section of steel), concrete cracking, loss of bond (aggregate-cement paste) and spalling. The control of these types of damage requires implementing inspection, maintenance and rehabilitation programs resulting in high costs to the state's taxpayers. Clearly, a more economical approach is to prevent deterioration and the resulting high cost of the rehabilitation and replacement.

Only some mechanisms of deterioration of reinforced concrete structures are relatively well known. Inspections of bridge substructures in Texas identified surface deterioration of reinforced concrete columns on bridges continuously exposed water. Initial hypothesis were that the surface deterioration was a result of the acidity of the water in which the columns were

exposed. However, evaluation of the water acidity indicated that the surrounding waters were only very slightly acidic and near neutral. Discussions between engineers from the Texas Department of Transportation (TxDOT) and researchers at Texas A&M University and the Texas Transportation Institute (TTI) hypothesized that the damage could be a result of microbial attack. Microbial attack is often identified as an acid attack because some microbes can produce sulfuric acid. This research, conductd by **Dr. David Trejo** at Texas A&M University, investigated whether microbes were present at areas on the bridge that were exhibiting attack, determined if there was a correlation between degree of damage and number of microbes present, determined if these microbes were acid producing microbes, and identified the microbes present at the field sites. Results indicate that microbes are present at the bridge columns experiencing surface deterioration, that the number of microbes present is directly correlated with the degree of damage, and that these microbes are acid producing. The researchers concluded that the damage to the concrete bridge columns is microbial attack. Because some bridge structures are exhibiting significant microbial attack of the concrete cover and because the long-term performance of the columns (and hence bridges) are most sensitive to concrete cover, further research is needed on how to prevent and mitigate this attack.

Research Spin-Off Opportunities

The following are examples of how a modest SWUTC research effort can spearhead early investigations that draw interest from other sponsors for a more focused, larger piece of work to be undertaken.

Dray Operation at Intermodal Sites on Texas Transportation Corridors

SWUTC Project #473700-00075/P.I. Rob Harrison

Mr. Rob Harrison at the University of Texas at Austin, was recently included on a team to conduct NCFRP 14 lead by Tioga. Tioga invited his participating based on the work first undertaken by this SWUTC study. The objective of the NCFRP 14 research is to develop a guidebook that will identify potential metrics for measuring drayage productivity and improvements that can be made by stakeholders to increase throughput, reduce air pollution, improve freight mobility, and increase truck driver productivity at marine container terminals nationwide.

Transit Services for Sprawling Areas with Relatively Low Demand Density: A Pilot Study in the Texas Border's *Colonias*

SWUTC Project #167177/P.I. Luca Quadrifoglio

Dr. Luca Quadrifoglio at Texas A&M University used preliminary results from his research effort to develope a Career Development proposal titled *An Innovative Flexible Transit Network for Sprawled Areas* to the National Science Foundation for the amount of $474,253. Winning proposal announcement expected January 2009.

The Potential for Improving Rail International Intermodal Services in Texas and the Southwest Region of the United States
SWUTC Project #473700-00076/P.I. Rob Harrison

This SWUTC study, led by **Mr. Rob Harrison** at the University of Texas, directly resulted in an award to a team of researchers at the Center for Transportation Research and Texas Transportation Institute of a TxDOT study entitled "Emerging Trade Corridors and Texas Transportation Planning" for a combined study total of $193,200.

Examining the Design and Developmental Factors that Influence the Incidence of Urban Traffic Crashes
SWUTC Project #167173/P.I. Eric Dumbaugh

Dr. Eric Dumbaugh at Texas A&M University used preliminary results from his research effort to develop a Career Development proposal to the National Science Foundation for the amount of $550,000. Winning proposal announcement expected January 2009.

SWUTC Colleagues Recognized for Research Contributions

SWUTC Executive Committee members, **Dr. Carol Abel Lewis** and **Dr. Lei Yu**, were named Director and Co-Director, respectively, of Texas Southern University's National Security Center of Excellence for Petrochemical Transportation Security. Research these individuals conducted as part of the SWUTC program contributed to their expertise, which prepared them for this critical work on our nation's behalf. Specifically, Lewis' work on emergency transportation, started when she participated on the Governor's Task Force after the 2005 hurricane season and funded as SWUTC FY2008 research. Dr. Yu's work on traffic simulation attracted the attention of the Department of Homeland Security staff. Admiral Jay Cohen, Under Secretary of the Science and Technology, visited TSU along with Congressman Al Green earlier this year to initiate the new security initiatives.

(L to R) DHS Under Secretary Jay Cohen, Congressman Al Green and TSU President John Rudley

Dr. Travis Waller, SWUTC researcher and holder of the Phil M. Ferguson Centennial Teaching Fellowship in Civil Engineering at the University of Texas at Austin, was selected to take part in the National Academy of Engineering's (NAE) 13th annual U.S. Frontiers of Engineering symposium. This symposium brings together young engineers from industry, academia and the government sectors. "Frontiers of Engineering is a proven mechanism for traversing engineering disciplines," said NAE President William A. Wulf. "By exposing bright young minds to developments in areas other than their own -- and giving

them lots of time to interact -- Frontiers enables advances in approaches and thinking that would not have occurred otherwise."

The symposium was held September 24-26, 2007 at Microsoft Research in Redmond, Washington and examined trustworthy computer systems, safe water technologies, modeling and simulating human behavior, biotechnology fur fuels and chemicals, and the control of protein conformations.

Dr. Chandra Bhat, SWUTC researcher and Adnan Abou-Ayyash Centennial Professor in Transportation Engineering at the University of Texas at Austin, along with co-authors **Dr. Jessica Guo** a former Ph.D. student, and **Rachel Copperman**, a current Ph.D. and Advanced Institute student, received the *2007 Pyke Johnson Award* from the Transportation Research Board (TRB) for their outstanding paper in transportation systems planning and the environment. The paper discusses the increasing interdependency of transportation and public health by highlighting the adverse effects of motorized transportation dependency on the environment and public health, and identified possible benefits of non-motorized transportation, like walking and biking that can increase social equity, improve personal health, and reduce traffic congestion and vehicular emissions. The paper also examines the effects of demographics and urban form on motorized transportation dependency and non-motorized transportation use.

Dr. Chandra Bhat was also selected to receive 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".

Dr. Chandra Bhat also received the *2008 Texas Institute of Transportation Engineers Student Chapter Advisor Award*. Recognizing Dr. Bhat's dedication and hard work guiding the future generation of transportation engineers in the state of Texas.

Dr. Jorge Prozzi, SWUTC researcher and Assistant Professor at the University of Texas at Austin, has been named Chair of the *Transportation Research Board's Committee on International Activities*. This committee is concerned with the evolution of an international perspective in all facets of all modes of transportation within the scope of the Board. His appointment runs until April 14, 2010.

Dr. Randy Machemehl, Associate Director for SWUTC research and Nasser I. Al-Rashid Centennial Professor in Transportation Engineering at the University of Texas at Austin was selected for membership into the *Civil, Architectural and Environmental Engineering Academy of Distinguished Alumni* at the University of Texas at Austin. This honor recognizes Dr. Machemehl's achievements and outstanding contributions to the field of Civil Engineering. The induction ceremony was held on November 9th, 2007 during the annual Alumni Banquet.

Dr. Randy B. Machemehl, was also 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.

At the January 2008 TRB meeting, **Kara Kockelman**, SWUTC Researcher and Associate Professor of civil engineering at the University of Texas at Austin, conducted her first official meeting as Chair of TRB's *Travel Survey Methods Committee* (ABJ40). The committee's website is http://www.travelsurvey-methods.org/index.asp for committee goals and activities information. She will serve as Committee Chair until April 2010.

On February 21st, **Dr. Kara Kockelman**, 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.

Dr. Kara Kockelman, a member of the National Research Council's Committee for the Study on Relationships among Development Patterns, VMT, and Energy Conservation, headed an NAS commissioned paper on the topic of carbon emissions control across the transportation, energy generation, building design, and land use domains, 2007-2009.

Dr. Eyad Masad, SWUTC Executive Commitee member and researcher and E.B. Snead I Associate Professor in the Zachry Department of Civil Engineering at Texas A&M University, has published a textbook entitled "Pavement Design and Materials." Coauthored with Dr. A.T. Papagiannakis, professor and department chair of civil and environmental engineering at the University of Texas-San Antonio, the textbook includes the most recent information regarding all the aspects of pavement engineering.

"The strength of the book is that it covers properties of pavement materials and design of pavement systems," said Masad. The textbook was published by Wiley in December 2007 and has already been adopted by many universities in the United States and internationally. According to Masad, it is also used by professional engineers to help them in material selection and pavement design.

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.

Dr. C. Michael Walton, SWUTC Executive Committee member and Ernest H. Cockrell Centennial Chair in Engineering at the University of Texas at Austin, and was elected chairman of the Texas Department of Transportation's *2030 Committee*. Deirdre Delisi, Chair of the Texas Transportation Commission, appointed the committee to undertake this important oversight role for the needs assessment. The 12-member committee, comprised of experts in business and transportation, coordinated a comprehensive update of Texas transportation needs through the year 2030. The committee is charged with presenting an estimate of the state's transportation needs in the context of today's economic reality and will work to quantify and describe the need for infrastructure investment over the next 20 years and beyond.

Dr. Michael Walton was also named a Distinguished Member of the American Society of Civil Engineers for his exemplary career as a civil engineering educator and researcher and for his professional and technical leadership in transportation planning, financing and policy analysis.

SWUTC Student Researcher Achievements

Ms. Nevena Vajdic, a SWUTC graduate student researcher in the Zachry Department of Civil Engineering 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. **Dr. Ivan Damnjanovic**, assistant professor in the construction, geotechnical and structural engineering division, serves as Vajdic's faculty advisor.

"It is a great honor to be selected among nominees from all around the world," said Vajdic, who researches project finance and specifically, analysis of the financial performance of toll roads. "This is a great opportunity to exchange knowledge and experience with my colleagues from other countries and to contribute to the diversification of professional network which is created by the IRF."

IRF has supported the Fellowship Program for graduate engineers and transportation managers for more than 50 years. Through the International Road Educational Foundation, the IRF awards grants to graduate engineers and other transportation professionals from around the world in support of full-time academic training.

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.

Chang Yi, SWUTC researcher and Ph.D candidate in the Community and Regional Planning Program at the University of Texas at Austin, was recently granted a dissertation fellowship from the National Science Foundation (NSF). The Doctoral Dissertation Research Improvement award from the NSF will help fund his dissertation, "The Role of Transportation in the Employment Outcomes of the Disadvantaged." The research will investigate the impact of accessibility to jobs provided by transportation on the employment achievements of low-income individuals. Chang's dissertation advisor is **Dr. Ming Zhang**.

Student Profile in Success: Jamaal Schoby

In May 2009, Texas Southern University graduate, **Mr. Jamaal Schoby** defended his thesis of the SWUTC research entitled "An Assessment of Transit Ridership: Increased Suburban to Urban Public Transportation Options in Houston, Texas." His work adapted an index designed by the Metropolitan Transit Authority to assess urban transit need to several suburban communities in Fort Bend and Brazoria Counties. Jamaal is now employed at URS Corporation in Charlotte, North Carolina.

Technology Transfer

Current information, timely delivered to the right people is the desired outcome for the SWUTC's technology transfer program. Both educational and research program activities pursue vital aspects of technology transfer. Educationally, the student/professor relationships are the principal loci of technology transfer activities -- knowledge exchanged between professor and students in classroom and research endeavors. In the research program, technology transfer outcomes are typically associated with the delivery of research products (papers, lectures, presentations, reports, video/media) -- from individual research projects --- to potential and interested users and colleagues. During 2008, the SWUTC researchers made 30 presentations at professional meetings and published 15 journal articles based on SWUTC research. The SWUTC maintains a website at http://swutc.tamu.edu that presents overviews all SWUTC research and educational activities. Technical reports generated by SWUTC research projects may be downloaded at http://swutc.tamu.edu/publications.htm.

Selected Technology Transfer Highlights

SWUTC Study Provides Input into TxDOT Long Range Plans

SWUTC Project #473700-00076/P.I. Rob Harrison

The opportunity arose this year for **Mr. Rob Harrison** at the University of Texas at Austin to assist in a major state DOT initiative. The Texas DOT asked the Texas Transportation Institute at Texas A&M University and the Center for Transportation Research at the University of Texas at Austin to estimate Departmental needs to 2030 and to provide insight into the other transportation modes in the state. Rob Harrison used findings from his SWUTC study *The Potential for Improving Rail International Intermodal Services in Texas and the Southwest Region of the United States* to support data provided by the rail industry to describe the rail sector.

SWUTC Project Develops Software Sub-Routines

SWUTC Project #476660-00007/P.I. Eyad Masad & Rashid Abu Al-Rub

Dr. Eyad Masad at Texas A&M University and his SWUTC research team through their project *Improving the Sustainability of Asphalt Pavements through Developing a Predictive Model with Fundamental Material Properties* have developed three Fortran subroutines that can be linked to the well-known software Abaqus through the user material subroutine UMAT. These subroutines can model and predict the nonlinear viscoelastic, viscoplastic, and damage behavior of asphaltic materials and asphalt and concrete pavements under various mechanical and environmental loading conditions. The three subroutines developed are: Simulating the Nonlinear Viscoelastic-Viscoplastic Behavior of Asphalt; Prediction of Moisture-Induced Damage in Asphalt Mixes and Predictions of the Coupled Viscoelastic-Viscoplastic-Damage Response of Asphalt Mixes.

This SWUTC research effort has also let to other significant technology transfer activities, with three journal articles currently in preparation, an additional paper that has already been published in a collection of technical papers from the AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, and two presentations already made at professional meetings in 2008.

SWUTC Has Successful Year Integrating Research Results into the Classroom

A fundamental component of the SWUTC technology transfer program is the classroom exchange of information between professors and students. Once again we surveyed our Principal Investigators to capture the extent of this transfer. SWUTC researchers reported that during the past year results derived from 28 SWUTC research projects were incorporated into 34 courses at the consortium universities. The following are a few examples.

Results from **Dr. Kara Kockelman's** study *Microsimulation for Coupled Models of Travel & Location Choice Behavior: Applications to Greenhouse Gas Emissions* were used in her UT-Austin course CE392E "Analysis and Acquisition of Transport Data." As part of this course, a survey about household energy consumption is being conducted by the students to understand the current energy consumption patterns across different Austin households and anticipate the long-term responses to new energy prices and policies.

Data produced by this **Dr. Jorge Prozzi's** study *Towards and Integrated Robust Highway Design Approach* are being used as part of the homework assignments for his UT-Austin course CE397 "Modeling Tools with Engineering Application." In this course, the students are provided with different set of experimental data that they have to analyze and present the results of the analysis to the rest of the class at the end of the semester.

Findings from **Dr. Amit Bhasin's** study *Laboratory Investigation of a Novel Method to Accelerate Healing in Asphalt Mixtures Using Thermo-Mechanical Treatments* were incorporated into his UT-Austin course CE391Q "Design of Bituminous Mixtures."

Results from **Dr. Yi Qi's** study *Vehicle Infrastructure Integration (VII) Based Road-Condition Warning System for Highway Collision Prevention* are being incorporated into her TSU course TMGT815 "Computer Applications in Transportation." Scenarios for testing the VII based work-zone condition warning system have been demonstrated in the classroom to provide the students with an example of applying emerging technologies for highway safety improvement.

Findings from **Dr. Carol Lewis'** study *An Inventory and Assessment of Models Used to Predict Emergency Evacuation* have been incorporated into her TSU course TMGT 810 "Fundamentals of Transportation" which includes a week on emergency evacuation. During that week, she includes an overview of the various evacuation models available to transportation planners.

Results from **Dr. Eric Dumbaugh's** study *Examining the Design and Developmental Factors that Influence the Incidence of Urban Traffic Crashes* have been incorporated into

two TAMU courses. PLAN 673 "Design for Sustainable Transportation" and PLAN 674 "Transportation Systems Analysis."

Results from **Dr. Ivan Damnjanovic's** research project *Increasing Resilience by Effective Management of Transportation Infrastructure: Estimating Fair Market Value of Insurance-Linked Securities* were included in the curriculum of his TAMU course CVEN 640 "Project Development."

RITA Administrators Visit SWUTC, UTCM and TTI

Mr. Paul Brubaker's December 11-12 visit to the SWUTC was his first since being sworn in as RITA Administrator last summer. RITA Associate Administrator for Research, Development and Technology Jan Brecht-Clark accompanied him on the visit. Dr. Brecht-Clark oversees the University Transportation Centers program, which includes TTI's Southwest University Transportation Center (SWUTC) and University Transportation Center for Mobility (UTCM). Administrator Brubaker and Dr. Brecht-Clark were presented overviews of SWUTC and UTCM, heard presentations from some of the key researchers and graduate students from both UTCs, and toured TTI's Translink® Laboratory, the Materials Lab and the Riverside Research Facility.

(L to R) Dr. Amit Bhasin (TTI/SWUTC), Administrator Paul Brubaker (RITA), Dr. Herb Richardson (TTI) and Dr. Jan Brecht-Clark (RITA) tour the TTI Materials Lab

SWUTC/UTCM Hosts Federal Site Visit

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

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 recently 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.

Transportation Safety Administration Administrator Visits TSU

The challenge of providing better security prompted a visit to TSU this past year by Congresswoman Sheila Jackson Lee and TSA Administrator Kip Hawley. During their visit, TSU faculty and staff overviewed the research and education programs of the Center for Transportation Training and Research and the SWUTC. Congress and the Department of Homeland Security are focused on improving the education and training of the future transportation security workforce. Highlighted during their discussions were the successful SWUTC sponsored education programs already in place at TSU.

(L to R) TSU Faculty Members George Qiao, Carol Lewis, and Bobby Wilson, Congresswoman Sheila Jackson Lee, TSA Administrator Kip Hawley, TSU Faculty Members Demetrios Kazakos and Lei Yu Tour Driving Simulator Facilities at TSU

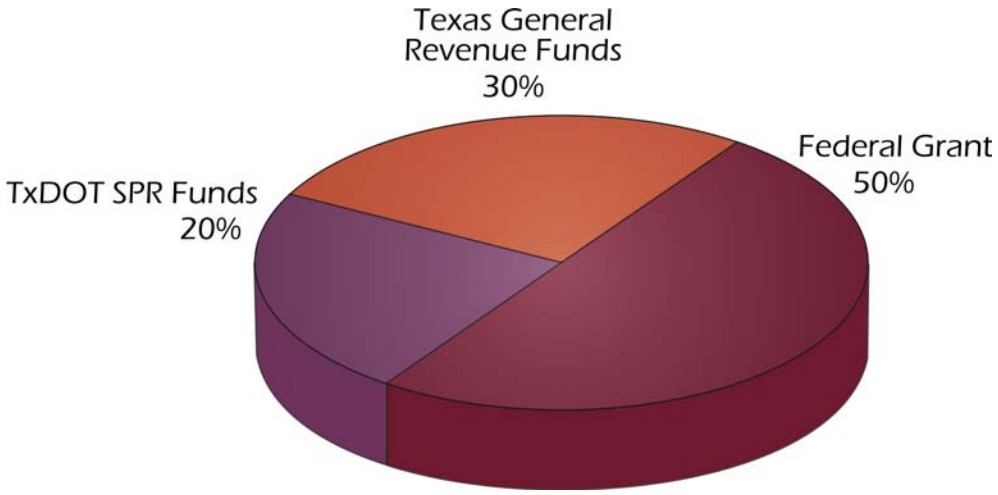
SWUTC Research Findings Used to Develop International Workshop

SWUTC Project #476660-00062/P.I. Rob Harrison

Work derived from **Mr. Rob Harrison's** SWUTC research *Evaluating the Impacts of the Panama Canal Expansion on the Texas and U.S. Economies* was used to help develop a workshop organized by the Centre for International Trade and Transportation at Dalhousie University, Halafax, Nova Scotia in late August of this year. The workshop, Atlantic Gateway Initiative, focused on the work done to date by individuals from diverse disciplines and with diverse views. The Workshop engaged researchers and world experts in a systematic discussion of they key economic, business and engineering drivers of gateway activity. The two objectives of the workshop were to 1) find common ground on possible futures to guide further developing the Atlantic Gateway to North America and 2) to identify outstanding research needed to aid in that development.

Rob Harrison's SWUTC work on trade routes, corridors, logistics costs and supply chain developments contributed to the theme of this event. Further, Mr. Harrison delivered two presentations on study findings during the course of the workshop.

Funding Sources



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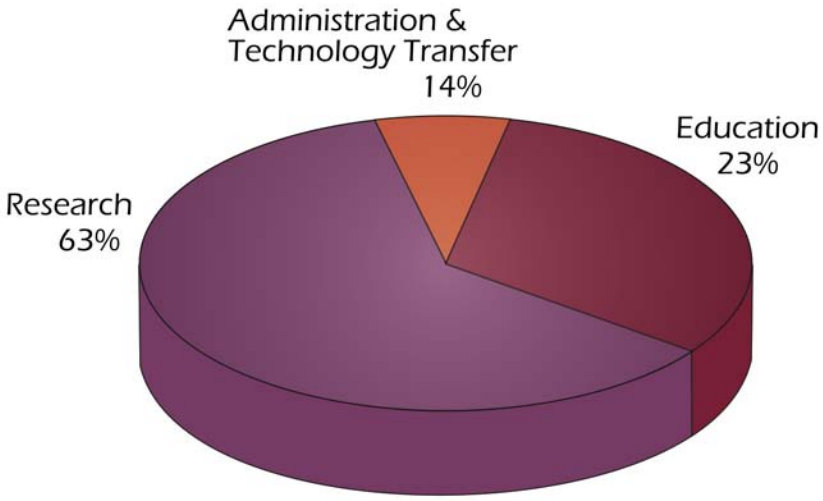

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