

2007 ANNUAL REPORT



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Southwest Region University Transportation Center Annual Report 2007

*Transportation Solutions to Enhance Prosperity
and the Quality of Life*

Region Six UTC

Table of Contents

Message from the Director.....	4
Theme and Vision.....	6
The SWUTC Consortium	7
Management Structure.....	8
Center Personnel	9
Office of the Director	16
Education Program	19
Research Program.....	27
Technology Transfer Activities	35
Financial Information	39

Message from the Director



Dock Burke
Director, SWUTC

My remarks highlight some of the events involving SWUTC's programs, processes, and people during the last year of our operation under the provisions of TEA-21. During this year, the SWUTC was successful in being selected again by USDOT to operate the UTC for federal region 6 under new SAFETEA-LU authorization. The selective highlights in this annual report mark the pursuit of our theme and the continuity between the thrust areas of associated with our existing grant and the ones in our newly-approved strategic plan.

We rely on four main thrust areas to focus our efforts to pursue the *Transportation Solutions to Enhance Prosperity and the Quality of Life* theme of SWUTC:

- Support Economic Growth and Trade
- Enhance Mobility and Infrastructure Efficiency
- Promote Safety and Safe Environment
- Transportation Workforce Development

The underpinnings for this theme are based in the geographic location of Region 6 and its primary economic, social, and environmental dynamics that shape and are being shaped by its transportation network. Considering the region's proximity to the border with Mexico, its land and water-based transportation systems, rapidly growing population, increasing economic and technology opportunities, educational challenges for its younger cohorts of population, and the challenging and changing environmental qualities of the region, crucial elements of the theme resonate with U.S.DOT's strategic plan for the critical transportation issues of the country.

New and Expanded Partnerships

SWUTC has established a partnership with the TxDOT in the matching research program. Mr. Rick Collins, TxDOT's research leader, has joined our Executive Committee to provide the leadership and support for coordinating the SWUTC research program with TxDOT's SPR program. This is a new, expansive dimension to the long-standing relationship between TxDOT and the consortium members of SWUTC.

SWUTC welcomes the opening of one of the nation's newest UTCs. In SAFETEA-LU, the University Transportation Center for Mobility (UTCM) was established for operation at the Texas Transportation Institute. Dr. Melissa Tooley has been named UTCM's director and is working closely with SWUTC leadership to create synergies in the two programs. This liaison promises to bring an exciting dimension to the outreach element of SWUTC's regional responsibilities.

RITA/USDOT partnership engagements have expanded during the past year reflecting the cooperative collaboration and communication underway in the UTC program offices. SWUTC has responded to offers and inquiries from USDOT personnel in pursuing several activities during the past year, including:

- Renewable Fuels Video Conference
- RFID Summit
- Inland Port Information Request
- Highway Infrastructure Research and Technology Conference
- Border-to-Border Transportation Safety Conference
- Weigh-in-Motion Video Conference

SWUTC's collaboration with other UTCs in Region 6 (and elsewhere) is underway in Arkansas, Oklahoma, Louisiana, Nebraska and North Dakota. Memoranda of agreement are in place at the University of Arkansas,

North Dakota State, and the University of Nebraska along with draft language being developed with the Oklahoma Transportation Center and the Louisiana University Transportation Center. We foresee some robust growth in these collaborations over the time period of the new grant.

Personnel Changes

We've had some significant personnel changes during the year that bear mention. First of all, Dr. Herbert H. Richardson resigned/retired as Director of TTI. Fortunately for us, Herb subsequently agreed to continue leading the SWUTC Executive Committee for the foreseeable future. Dr. Conrad Dudek has retired from the faculty at Texas A&M; Dr. Tracy McMullen resigned her faculty appointment at UT@Austin; and Mr. Rick Collins from TxDOT, as noted earlier, joined the SWUTC Executive Committee.

I would like to make special mention of the retirement of a founding member of the SWUTC. Mr. G. Sadler Bridges, a member of SWUTC Executive Committee since its inception, has retired from the Texas Transportation Institute after completing a distinguished career of more than 40 years of service to Texas. An economist by academic training, Sadler was a principal author of the original competitive proposal selected by USDOT in 1988 to establish the Region 6 UTC at TTI. Since that time, he has provided effort, advice, and leadership during every critical phase of the SWUTC. For that he deserves our warm thanks and genuine appreciation.

Personally, I am pleased to note that Sadler has been my friend, mentor, and colleague for my entire career at TTI. It has been a good ride, Sadler, and I wish for you only the best in your retirement!

Our Challenge to ourselves

As I have stated before, we in SWUTC seek to be first among the UTCs in the U.S. in advancing the goals of the program set by RITA/USDOT. This means that our research, educational, and technology transfer programs must be sustainable at a high level of excellence. Throughout the U.S., but especially in Region 6, we expect our programs 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,
- 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 Texas,



Dock Burke
October 31, 2007

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. The transportation research and educational activities of the three consortium members in the SWUTC produce the largest combined program of its kind in the US. Further, the added strength from the synergy among the consortium's transportation faculty and research professionals has created a unique blend of efforts that has enhanced the education, research, and service leadership within Region 6.

Lead University - Texas A&M University System



The Texas Transportation Institute is headquarters for the SWUTC and is one of the premier transportation research entities 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

The Texas Southern University and its Center for Transportation Training and Research present a premier 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

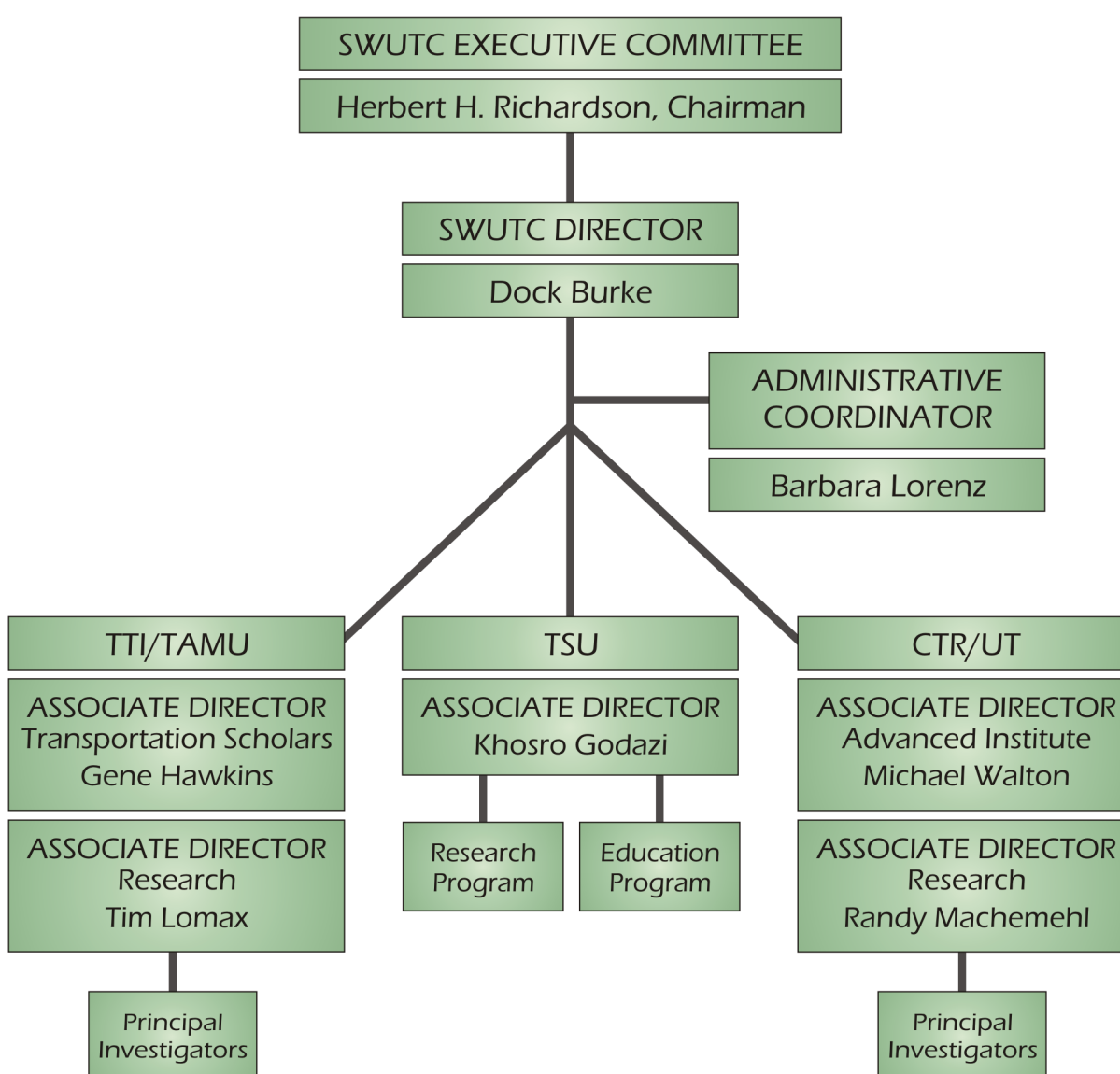


The transportation programs at the University of Texas at Austin and its Center for Transportation Research feature well-equipped facilities, top-notch research and teaching faculties, and high-quality students. A wide range of expertise in science, engineering, and policy gives the SWUTC a rich skill 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 an Administrative 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.



SWUTC Executive Committee

Dr. Herbert H. Richardson, chairman



Dr. Richardson is Chancellor Emeritus, 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.

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 inter-city 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. Robert Harrison, member



Mr. Harrison is a Senior Research Scientist and 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. Most recently, Mike Schofield, a UT student working with Mr. Harrison on a truck safety SWUTC study was awarded the 2005 graduate paper competition in the Research and Education Division of ARBTA. 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 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, chair of the Markings Technical Committee, and a member of the Research Committee. In addition to his NCUTCD activities, he is a member of the Transportation Research Board (TRB), the Institute of Transportation Engineers (ITE), and American Traffic Safety Services Association (ATSSA). Within TRB, he is the 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. Since 1992, she has conducted research for the Texas Department of Transportation (TxDOT) regarding 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. She has completed work including research titles, Optimizing Route Specific Marketing to Increase Public Transit Ridership, Land Value Assessment of Bus Transit Facilities, and Criteria for Transit-Friendly Decision Making. 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. During that time, she developed the citizen participation programs and bus routing scenarios. She was also responsible for systemwide bus routing plans and METRO capital projects including Park & Rides, transit centers, and rail planning.

Dr. Lewis 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 technical 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. Walton is Professor of Civil Engineering and Ernest H. Cockrell Centennial Chair in Engineering, University of Texas at Austin. Dr. Walton is a member of the National Academy of Engineering. He is 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. In other professional society affairs he serves as the Senior Vice Chairman of the American Road and Transportation Builders Association and a member of the Board of Governors of the Transportation and Development Institute of American Society of Civil Engineers. Dr. Walton has received numerous awards including the 2005 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." Dr. Walton's other awards include the 2000 George S. Bartlett Award in recognition for outstanding contributions to highway progress. The Bartlett Award is considered to be among the highest honors in the highway transportation profession. The American Society of Civil Engineers presented 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 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. 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. 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.

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.

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.

FY07 SWUTC Executive Committee Member Changes

Mr. Rick Collins



A new member of our Executive Committee, Rick 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.

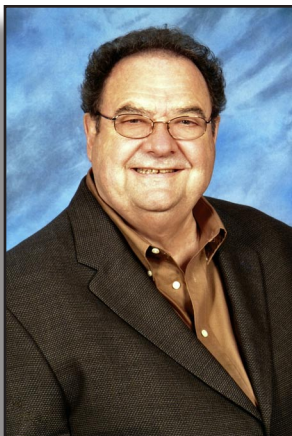
Mr. Collins earned his bachelor's degree in civil engineering in 1981 from Texas A&M University and his master's degree in engineering from the University of Texas at Austin in 1988.

Executive Committee Departures



Dr. Tracy E. McMillan

Dr. McMillan left her teaching position as Assistant Professor in the Community and Regional Planning Department at the University of Texas at Austin at the end of August 2007 as her family was relocating to Flagstaff, Arizona. She is still an Adjunct Assistant Professor in the Architecture Department at the University of Texas at Austin. She also has her own consulting firm in Flagstaff.



Mr. G. Sadler Bridges

After more than 40 years of experience in transportation research, Mr. Bridges retired from the Texas Transportation Institute in August 2007. During his distinguished career, Mr. Bridges' research included urban transportation, bus operations, high occupancy vehicles, and fixed guide-way transportation. He was a member of the Mobility 2000 Group on the application of advanced technologies to vehicles and highways. He was a founding member of ITS America, a designated advisory commission to the U.S.DOT on ITS issues. During his tenure as Interim Director of the Texas Transportation Institute, TTI was designated as one of three Research Centers of Excellence in ITS. One of his driving interests was to expand TTI into new technologies and new disciplines of transportation. Upon his retirement, Mr. Bridges was awarded Executive Associate Director Emeritus status by the TAMUS Board of Regents.

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 55 research projects, authored or co-authored 99 research reports and papers, and has made over 70 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 the 2003 recipient of the *Regents Fellow Service Award* presented by the Board of Regents of the Texas A&M University System. This prestigious award honors research professionals within the Texas A&M system who have provided exemplary professional service to society that has created large and lasting benefits to Texas and beyond.



SWUTC Administrative Staff: Dock Burke and Barb Lorenz

Barbara Lorenz, Senior Administrative Coordinator

Barbara Lorenz serves as Administrative 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 29 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

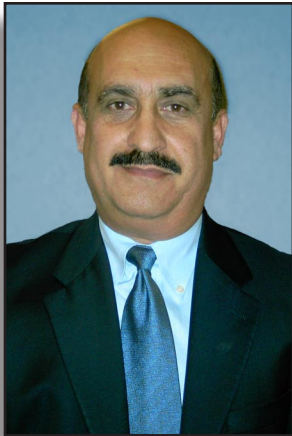
(See bio on page 10)



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 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. 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 11)

Recent Office of the Director Departure

Dr. Conrad Dudek



Dr. Dudek, research engineer in the Operations and Design Division and professor in the Department of Civil Engineering at Texas A&M University, announced his retirement from TTI in September 2006 after nearly 40 years of service in the Texas A&M University System.

During his career, Dr. Dudek served as director of the Southwest Regional University Transportation Center from 1988 thru 1991. Dr. Dudek was also the program manager, project director, principal investigator, principal researcher or study supervisor on over 30 research projects sponsored by state and federal agencies.

Over the last 15 years, the academic portion of the Texas A&M SWUTC program has been designated as an “Advanced Institute (AI)” administered by the Department of Civil Engineering and led by Dr. Dudek. Ground breaking innovations introduced by Dr. Dudek, most notably the Mentors Program and other activities, brought national recognition to the SWUTC and the Civil Engineering Department’s transportation education programs. In recognition of his dedicated service, the Board of Regents for the Texas A&M University System conferred upon Dr. Dudek in February 2007 the title of Professor Emeritus.

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 specialties 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.



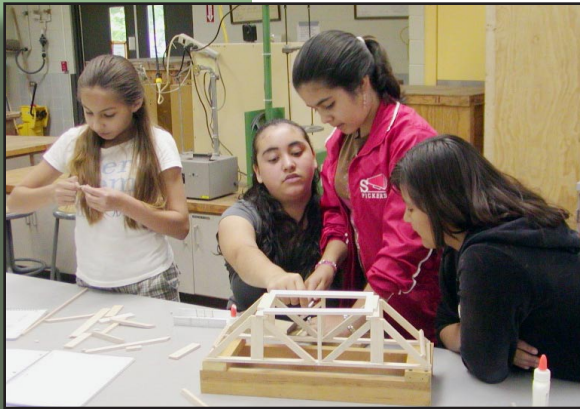
SWUTC Pre-College Initiative Highlights

During the 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. In August 2004, these road-show promotional materials were made available for free download at <http://tti.tamu.edu/groups/cpd/resources/brochures/index.htm>. Now 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 sci-

ence is now being promoted on a continuing basis at Texas science fairs along with meteorology, physics and other sciences. Through these efforts, SWUTC researchers were able to directly contact over 1,600 Texas students at career fairs, science fairs and engineering recruiting events during the 2007 fiscal year.

2007 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.



Kingsville students construct winning bridge

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 16 students participated in the two-week long program conducted in early June.

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 20 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. This year 4 students took part in this program which provides the students with hands-on experience, 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 89, 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.

2007 Go Girl! Program

SWUTC Project #167459/P.I. Debbie Jasek

The Go Girl! program initiated in FY06, had a second successful year as it conducted another event in Dallas, TX on March 17, 2007. This year 25 girl scouts attended this soon to be annual event. The girls ranged in ages 6 to 8 and were awarded a Girls on the Move Girl Scout Council Patch. Prior to the event the scouts learned about the importance of transportation in the Dallas Metroplex. Scouts then toured local transit facilities, rail services, and the historic McKinney Avenue Trolley.



Dallas Go Girls

New Pre-College Initiative for 2007

On the Move! Exploring Transportation Career Horizons

SWUTC Project #167164/P.I. Debbie Jasek

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 mentoring 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.



On the Move Houston students learn teamwork

The first On the Move event was held on November 29th in Banquette, TX. Fifteen junior high school students participated in the event, which consisted of a number of transportation and engineering learning activities.

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The second event was held at Tidehaven High School on February 27, 2007. Over 350 students attended the program. This event consisted of a career and learning program entitled On the Move with Science, Transportation, Engineering and Math. Multiple agencies participated in the program including TxDOT, TTI, The Lower Colorado River Authority, Texas A&M Corpus Christi, Victoria College Process Engineering Department, Texas State Technical College Diesel Mechanics, Texas Parks and Wildlife, Matagorda County Soil Conservation District, South Texas Nuclear Power Project, and the Gulf of Mexico Foundation. These agencies all provided professionals and materials on how Science, Math, Transportation and Engineering are used in the “real” world.

The Houston On the Move! event was held on May 15th. This event was co-hosted by the Harris County After-School Enrichment (CASE) program and Continental Airlines. Approximately 125 students participated in the event which included a light rail trip downtown to the Continental Airlines Headquarters. At the headquarters they were met by pilots and other airline personnel including the CEO of Continental Airlines, Larry Kellner, and participated in transportation Olympics.

On May 19th the final event was held in Dallas. Twenty five 4th-6th grade students attended the event where they rode the light rail train to downtown Dallas and Union Station. There they toured the historic station and viewed Dallas from the top of Reunion Tower. During the tower tour, they participated in a contest to spot transportation related sites. Afterwards, the group visited the American Railroad Museum.

Student and parent feedback from all of the events has been extremely positive. Some schools have already scheduled similar events to be conducted next year.

Recruitment Toolbox for Transportation Professionals Wins ITE Award

SWUTC Project #167765/P.I. Jodi Carson

The SWUTC education initiative *Developing a "Recruitment Toolbox" for Transportation Professionals* received the 2007 ITE Coordinating Council Award for Best Technical Product on August 4, 2007.

This initiative addresses the decline in the transportation engineering workforce and the lack of progress towards the recruitment of transportation professionals. It recognizes that greater involvement of the professional community in recruitment efforts is largely precluded by the time, energy, and creativity requirements to develop necessary transportation-related outreach activities. The goal of this work was to produce a tool to better support professional participation in local recruitment efforts.

The completed Recruitment Toolbox contains a total of 92 hands-on activities that cover a range of age levels (Kindergarten through 12th Grade) and topic areas (e.g., environment and energy, planning and urban development, traffic safety, etc.). Each activity description is one to three pages in length and outlines activity duration, required materials and supplies, learning objectives, background information, individual or group student tasks, discussion points, and originating sources. Links to additional on-line resources that support the activity are also included. Companion products developed as part of this effort include: (1) Outreach Guidelines focus on understanding your audience and effectively engaging student participants and (2) a product Assessment Plan that includes three levels of information gathering: website access, pre-activity survey, and post-activity survey. The Recruitment Toolbox and its companion products were made available to ITE members in December 2006 via the ITE website (<http://ite.org/councils/Education/Recruitment/default.asp>).

The development of the Recruitment Toolbox represents an important step in encouraging higher quality and more frequent outreach to pre-college students. It serves to benefit all members of the Institute including those who would participate more often in outreach events if provided adequate tools and resources and those who regularly participate in outreach events but seek fresh activity ideas.

SWUTC Summer Undergraduate Fellows Program



TAMU Summer Fellows and Texas A&M Chapter ITE students tour TxDOT TranStar Facility

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 universities have the opportunity to work with researchers and gain exposure to many different areas of transportation research. To 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 oral presentations on their research and produce a paper for publication. During the summer 2007 session, 4 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 86th 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.

Since the beginning of this current grant in the fall of 1999, 185 students have been awarded fellowships in the SWUTC education programs. Of those students, 139 have since graduated with 87% entering into the field of transportation either with the government or private industry sectors, or into an academic/teaching environment.

Transportation Engineering Student Seminar and Development Program

SWUTC Project #473700-00035/P.I. Gene Hawkins

This educational program was established in FY06 to provide Texas A&M University graduate and undergraduate students an expanded range of experiences. The program consists of a field trip program and a seminar series.



TAMU students tour Bryan TxDOT Facilities

This year the students participated in a half day-long field trip to the TxDOT Bryan District office in October, 2006. Ten students participated in this field trip, which included visits to the district materials lab, sign shop, and signal shop.

Two student seminars were sponsored by this program. The first on February 8, 2007, hosted Dr. Shane Turner from Beca, a multi-disciplinary engineering consulting practice in New Zealand. His presentation "Crash Prediction Modeling in New Zealand" discussed various modeling studies that have been completed in New Zealand by Beca, along

with current and proposed research projects. Dr. Turner explained that generalized linear models have been developed for the majority of intersections and road links in New Zealand. And that these models have been used to assess the safety impacts of various road features including speed, visibility, crossing width for cyclists and traffic signal compliance rates for pedestrians. While these modeling methods were briefly outlined, the presentation focused on the outcomes and applications of the research. Some general data on crash trends in New Zealand were also presented.

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

STUDENT AWARDS

SWUTC's Student Award Winners

Each year, in addition to selecting the overall SWUTC Outstanding Student to represent the SWUTC at TRB, the SWUTC honors two more students for their academic, professionalism and leadership achievements. Each of the three major awards presented yearly at the SWUTC - the *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. Yuanchang Xie, transportation doctoral student at Texas A&M University was selected to win this award for his outstanding academic performance, ability to conduct scholarly research and publish in high quality journals, and active involvement and leadership in student chapter activities.

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

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

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

Naomi Ledé Outstanding Master Student Award



Ms. Rachel B. Copperman is currently a Ph.D. student at the University of Texas at Austin in transportation engineering. She received her M.S.E. from The University of Texas at Austin in Civil Engineering and her B.S. from the University of Virginia in Systems Engineering. Rachel's master's thesis and dissertation research focuses on understanding the motivations and behavior underlying children's travel patterns. She is also currently researching in the area of activity-based travel demand modeling by contributing to the development of a continuous-time activity-travel prediction software for the Dallas Fort-Worth (DFW) area. Rachel is a current recipient of the Eisenhower Graduate Transportation Fellowship and attended the 2005 ENO Leadership Development Conference. She is also the current President and a past Vice President of The

University of Texas at Austin's student chapter of ITE. Rachel received the SWUTC Dr. Naomi Ledé Award to the Outstanding Masters Student because of her all-round exemplary performance in academics, research quality and productivity, and leadership activities. Rachel represented the SWUTC at the annual UTC Outstanding Student of the Year Awards ceremony during TRB's Annual Meeting in January, 2007. Rachel's major professor is Dr. Chandra Bhat.

William J. Harris Outstanding Doctoral Student Award

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



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

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

SWUTC Graduate Student Achievements

Mr. Stephen Boyles, Advanced Institute graduate student supervised by Dr. Travis Waller at the University of Texas at Austin was the winner of the *2006 CUTC Milton Pikarsky Memorial Award* for best MS thesis awarded during the 86th Annual Meeting of the Transportation Research Board in January. He was also selected to receive the *2007 Daniel B. Fambro Student Paper Award* awarded by the Institute of Transportation Engineers (ITE), in recognition of his paper entitled "A Stochastic Delay Prediction Model for Real-Time Incident Management".

Ms. Rachel Copperman, Advanced Institute student supervised by Dr. Chandra Bhat at the University of Texas at Austin received the *2007 Outstanding Student Award* from the Texas Institute of Transportation Engineers recognizing the outstanding student member in each of the TexITE Student Chapters.

Mr. Jamaal Schoby, graduate transportation studies student and graduate research assistant supervised by Dr. Carol Lewis at Texas Southern University received the 2006 American Public Transit Foundation *Dr. George Smerk Scholarship Award*. This award was in recognition of Jamaal's contributions to transit ridership and transit system design research.

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

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

Ms. Jennifer Duthie, Advanced Institute graduate student supervised by Dr. Jorge Prozzi at the University of Texas at Austin, was chosen for the 2007 Eno Transportation Foundation's Leadership Development Conference held in Washington, D.C.

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 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 2007 Research Highlights

Testing and Modeling of Truck Emissions while Idling Examined

SWUTC Project #167650/P.I. Lei Yu

<http://swutc.tamu.edu/publications/technicalreports/167650-1.pdf>

Air pollutant emissions and fuel consumption are the most important problems associated with vehicle idling. Truck idling in particular is more problematic than other vehicles mainly because of the duration of idling and the high amount of emissions produced. This study identified the characteristics of truck idling emissions by collecting data using an advanced portable emission measurement system (PEMS), in which the methodology was made to measure actual idling emissions from truck tailpipes and to relate measured emissions to altered pre-testing driving conditions. Employed for the testing is the On-Board Emission Monitoring system OEM-2100TM, an advanced PEMS. This equipment can determine the second-by-second emissions of HC, CO, CO₂, O₂, and NO_x in the exhaust gas by a functional equivalent of a repair-grade dual five-gas analyzer subsystem. Altered driving circumstances considered during truck idling tests include cold starts and hot starts, different distances and durations of driving before the tests, different roadway facility types used while driving, different durations of idling tests, etc. Measured emissions under all the different pre-testing driving conditions were then analyzed and compared. In addition, the measured idling emissions were compared with emissions estimated by the emission factor model MOBILE6 for the particular tested truck.

Study Modifies Driving Simulator to Study Traffic Engineering Problems

SWUTC Project #167142/P.I. Sue Chrysler

<http://swutc.tamu.edu/publications/technicalreports/167142-1.pdf>

As computing power has increased, and costs decreased, the use of high quality interactive simulation has spread throughout the transportation community. Modern simulators range from small PC-based simulators with steering wheel borrowed from computer games to the full motion, full vehicle cab National Advanced Driving Simulator at the University of Iowa. Most researchers using driving simulators are interested in ergonomics, human factors, or driver performance. Often the simulated world on the screen is functioning mainly as a workload inducer while the focus of the study is on driver distraction or driver interaction with some vehicle system. For this reason, many of the fine traffic engineering details of simulated worlds are overlooked by the developers and the roads are not “quite right”. For this reason, many traffic engineers have dismissed simulators as glorified computer games and have not explored simulators’ potential to evaluate the effects of operations and geometric design features on driver behavior.



Chrysler developing new application for driving simulator

The Texas Transportation Institute operates a mid-range fixed-base interactive driving simulator with a full-sized sedan and three large front projection screens. This project aimed to demonstrate the usefulness of a driving simulator in evaluating geometric designs for two-lane roads. Paved surface width has been shown to be correlated with crash rates and travel speeds on two lane rural roads throughout Texas. This project examined how travel lane width, edge line striping, and shoulder width affect driver errors on these roadway types. Forty eight subjects participated in the driving simulation experiment which utilized varying lane widths and shoulder and striping configurations. The main driving performance measure was offset from centerline, or more precisely the variance in this offset. In other words, how much do drivers stray in the lane? The results showed that drivers varied in their lane most when the paved surface was the widest. For curves, driver strayed more when a shoulder was present irrespective of lane width. The results for tangent sections were not quite as consistent, but still showed more

lane variance with a shoulder than without.

In traditional civil engineering research, this type of study would have been conducted on the road using tube counters to measure speed and lane position. Sites with different paved surface and shoulder width would be identified and field data collected. This type of study is often difficult because it's nearly impossible to perfectly match the site conditions in terms of geometric design, environmental surround, and traffic volume. While this type of real-world study is certainly needed to validate laboratory research, this research demonstrated that the simulator can be a useful tool to narrow down the study variables before costly field data are collected.

Mexican Truck Safety at the Texas/Mexico Border

SWUTC Project #473700-00071/P.I. Robert Harrison

<http://swutc.tamu.edu/publications/technicalreports/473700-00071-1.pdf>

To the casual observer, the southern U.S. border seems inefficient. Trailer interlining, cargo consolidation, differing border customs processes, congested infrastructure and security procedures create a slow moving, multi-step process that produces long truck lines, noise and air pollution. The drayage system, currently provides interlining – insuring that trailers moved to the border by Mexican highway tractors are delivered to truck load U.S. terminals near the border. This is, of course, a more expensive process than simply driving across the border in Free-Flow traffic conditions. “Opening the border” at this moment would not remove all of the cost impediments currently preventing a move from dray to over-the-highway trucks. The answer lies in improving port of entry clearance processes to reduce truck queues which, when combined with border opening, will offer operators an opportunity to raise efficiencies.



Trucks entering the U.S. at El Paso

The long held opinion that Mexican trucks are less safe is not supported by the post-2000 DPS data. The latest safety data show a difference in Vehicle Out of Service (VOOS) rates of only 0.5% between Mexican and U.S. trucks at the border – an amount that suggests equivalency. It should also be noted that these inspections mostly compare long-haul U.S. trucks with older, short-distance drayage Mexican trucks. Taking this additional information into account, this study finds that it is very doubtful that the average drayage Mexican truck is significantly less safe than its American equivalent.

All analyses from the temporary stations suggest that with the border open, Mexican long haul trucks entering through Texas ports of entry are likely to meet or exceed the safety standards set for U.S. trucking – a key sovereignty issue within the NAFTA. It is therefore an open question at this point whether the construction of state-of-the-art inspection facilities, together with greatly increased inspection rates at the border is good public policy when the current DPS operations have brought citations down to a level at, or below, those of regular over the highway trucks operating across the state.

The findings from this research have received much attention from the media including *The New York Times* where the P.I., Rob Harrison, provided input into their September 9, 2006 article “For Mexican Trucks, a Road into the U.S.”

A Longitudinal Assessment of Land Use, Land Values and Bus Facilities

SWUTC Project #473700-00051/P.I. Gwendolyn Goodwin

<http://swutc.tamu.edu/publications/technicalreports/167620-1.pdf>



Kashmere Transit Center in Houston

This study updated and expanded the 1997 SWUTC research involving the effect that bus transit centers have on properties immediately adjacent to and 1/4 mile away from selected Houston Metropolitan Transit Authority (METRO) and Central Ohio Transit Authority (COTA) transit facilities.

After examining the transit centers from Houston and Columbus, several findings became apparent. First, the definition and roles of transit centers are evolving. Over the past few decades, a shift is occurring from the transit center viewed strictly in a functional purpose into a community asset that can generate additional sources of revenue and increase ridership for transit agencies.

Second, among all transit centers a weak positive relationship was noticed that fostered moderate property value increases for commercial/residential properties.

Finally, the investment in new transit centers serves as a catalyst for other development nearby. It was also found that when a transit authority partners with community organizations, local businesses and other public agencies to enhance an economically challenged area while improving transit mobility, the transit authority can leverage funds to create a more comprehensive project. This growing trend emphasizes the connection between public and private sectors and their willingness to partner with transit agencies to improve a neighborhood.

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

This research effort continues to be a “hot” issue, impacting not just traditional economic evaluations but also social issues such as environmental justice and externalities. This study has generated great interest from other University staff e.g. UC Davis and METTRANS at USC as well as TxDOT, other state agencies and the private sector. In addition to last year’s expanded TxDOT funded study for \$73,999, the TxDOT District at Pharr has asked the study team to provide some insight into the origin-destination patterns for the dray operations in the McAllen area. In addition, Union Pacific has asked the team to undertake an in-depth study of dray operations at its two major Houston yards.



Development of the WALKSAFE Pedestrian Safety Testbed in College Station

SWUTC Project #167762/P.I.: Shawn Turner

After discussions with his project monitor Ana Do of FHWA, Shawn Turner received a big return on his research effort when FHWA awarded him \$236,000 for additional pedestrian safety work.



Multimodal Network Models for Robust Transportation Systems

SWUTC Project #167867/P.I.: Travis Waller

Through the great strides made in this fundamental SWUTC research that aides the planning of robust multimodal transportation networks, Travis Waller was able to successfully acquire additional funding from TxDOT for \$138,000 to further research in this area. Additionally, work on this project has been enhanced by the research team's contractual agreement with TxDOT to study Austin's arterial system. The work in this SWUTC project is proving invaluable in creating the dynamic multi-modal model for Austin. Applying our research to a real application will certainly provide the team with insights that will lead to future research improvements.



Trucking Industry Responses in a Changing World of Tolling and Rising Fuel Prices

SWUTC Project #167167/P.I.: Sharada Vadali

This research has already led to additional funded work that will explore truck tolling issues related to route diversion and preferences for the tolling options being immediately pursued for the Dallas area. This new research is budgeted for \$60,000 and was secured based on discussions with TxDOT and sharing project research work and the specific focus on the Transportation Club of Dallas. Additional funding related to some of the research issues raised by the SWUTC work was secured for a TxDOT-GBE study exploring indexing potential economic effect of mobility projects affecting trucks. The research team has also submitted a proposal to the National Cooperative Freight Research Program - 2 (Impacts of Public Policy on Freight Transportation Systems).



SWUTC Colleagues Recognized for Research Contributions



SWUTC Executive Committee Chairman and Texas Transportation Institute Director Emeritus **Dr. Herb Richardson** received two awards during the annual Transportation Research Board meeting in January. Dr. Richardson was presented the *Roy W. Crum Distinguished Service Award* January 24th during the Chairman's Luncheon at the Transportation Research Board (TRB) 86th Annual Meeting. The prestigious Crum Award recognizes outstanding achievement in the field of transportation research.

In addition, Dr. Richardson received the 2007 Council of University Transportation Centers (CUTC) *Award for Distinguished Contribution to University Transportation Education and Research*. This award recognizes individuals with a long history of outstanding contributions to university education and research, resulting in a lasting impact on the transportation field.



Dr. C. Michael Walton, SWUTC Executive Committee member and key researcher, was elected chairman of the American Road & Transportation Builders Association (ARTBA) at the organization's annual meeting in October 2006. Walton has held a variety of ARTBA leadership positions and helped develop the association's policy positions on federal transportation development issues. Walton, who holds the E.H. Cockrell Centennial Chair in Engineering at the University of Texas at Austin, is an international leader in transportation policy and engineering analysis.



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



University of Texas at Austin, Civil, Architectural and Environmental Engineering Associate Professor **Dr. Kara Kockelman** recently received the 2006 *Geoffrey J.D. Hewings Award* from the Regional Science Association International (RSAI). The award recognizes distinguished contributions to regional science by young researchers. Kockelman's primary research interest include the statistical modeling of urban systems (including models of travel behavior, trade and location choice), the economic impacts of transport policy, crash occurrence and consequences, and transport policy-making.

She was also awarded the 2007 *Harland Bartholomew Award* from the American Society of Civil Engineers (ASCE). She was recognized for her 'credit-based congestion pricing' theory, which uses variable toll rates to eliminate recurring traffic congestion while allocating scarce road space equitably. This award is given annually to an ASCE member who enhances the role of civil engineers in urban planning and development.

Dr. Kockelman was also designated as Chair of the Transportation Research Board's Committee on Transportation Survey Methods, which is a three year term beginning in April 2007. Her graduate students are currently conducting a research study to explore public opinion of carsharing, a new strategy for reducing traffic congestion and emissions in Austin.



Dr. Chandra Bhat, University of Texas Adnan Abou-Ayyash Centennial Professor in Transportation Engineering and longtime SWUTC researcher, was also among 105 engineers chosen to participate in the National Academy of Engineering's 2006 *U.S. Frontiers of Engineering* symposium for accomplished young engineers on September 21-31 at the Ford Motor Company in Dearborn, Michigan.

This symposium brings together emerging engineering leaders between the ages 30 and 45 from all sectors to discuss pioneering work and cutting-edge research. The symposium covered topics that include the rise of intelligent software systems and machines, the interface between nano- and bio-materials, personal mobility for the 21st century and supply chain management. The goal of the annual meetings is to facilitate collaboration between outstanding engineers, transfer new techniques and establish professional networks.

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

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



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





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



Dr. Luca Quadrifoglio, assistant professor in the Transportation and Materials Division of the Zachry Department of Civil Engineering, has been selected to receive the *2007 Pritsker Doctoral Dissertation Award*, third place, by the Institute of Industrial Engineers. Quadrifoglio was chosen for this award for his dissertation “A Hybrid Fixed and Flexible Transportation Service: Description, Viability, Formulation, Optimization and Heuristic.” His research areas include public transportation, logistics operations, scheduling algorithms, stochastic processes, optimization, and decision analysis. Quadrifoglio received his award at the Industrial Engineering Solutions 2007 Conference, to be held May 19-23, in Nashville.



Dr. Tim Lomax, Associate Director for SWUTC Research at TAMU, and Research Engineer at the Texas Transportation Institute was awarded the *2007 TTI/Trinity Charley V. Wootan Career Achievement for Research Award* for distinguished technical TTI research performance.



SWUTC Student Researcher Achievements

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

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

Mr. Stephen Boyles, **Ms. Allison Conway**, **Ms. Rachel Copperman**, **Ms. Jennifer Duthie**, **Mr. Jeffrey La-Mondia**, **Ms. Lauren Gardner**, and **Mr. Jason Lemp** SWUTC graduate researchers at the University of Texas at Austin were winners of Eisenhower Graduate Fellowships for 07-08 awarded by the Universities and Grants Programs of the National Highway Institute, Federal Highway Administration.

Technology Transfer Activities

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. Since the fall of 1999, SWUTC research has generated 164 final technical reports. SWUTC researchers and students have presented 327 technical papers at national/international forums, and published 135 technical papers in professional journals. 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 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. This year, we surveyed our Principal Investigators to capture the extent of this transfer. SWUTC researchers reported that during the past year results derived from 20 SWUTC research projects were incorporated into 26 courses at the consortium universities. Two examples from each university are as follows:

Results from Dr. Michael Neuman's *The Texas Urban Triangle: Framework for Future Growth* are being incorporated into graduate courses in TAMU's Department of Landscape Architecture and Urban Planning. Improved geographic information systems techniques are taught in PLAN 662 , PLAN 675 , PLAN 625, and PLAN 625.

Results from Dr. Eric Lindquist's *Climate Change/Variability Science and Adaptive Strategies for State and Regional Transportation Decision Making* study are being incorporated into the TAMU Bush School course, BUSH 671 Science and Technology Policy and Politics which explores the impact of public policy on science and technology.

Finding from Dr. Leigh Boske's *The Role of Air-Cargo in Facilitating Trans-Pacific Trade and Promoting Economic Development in Texas* are being applied in two new LBJ School courses PA 393L Principles of Transportation Economics and PA 388K Transportation Policy.

Models from Dr. Travis Waller's *Multimodal Network Models for Robust Transportation System* are being incorporated into two University of Texas at Austin courses CE 397 Transportation Logistics and Commodity Flow Modeling and CE 392 Transportation Network Analysis I.

Dr. Carol Lewis' *Testing Information to Improve Communication with Communities and Decision Makers* has been incorporated into Texas Southern University course TMGT 842 Transportation Project Implementation.

Dr. Lei Yu's *Measurement and Evaluation of On-Road Vehicle Emissions at Signalized Intersections* has been incorporated into Texas Southern University course TMGT 885 Quantitative Assessment of Transportation Environmental Impacts.

SWUTC Hosts International Guests



Visitor view test crash

On June 28, the SWUTC hosted a group of international transportation professionals who visited the Texas Transportation Institute as an extension of a three-day conference based in Austin. The guests were all attendees of the Transportation Research Board's 9th International Conference on Low-Volume Roads being sponsored by Ms. Jolanda Prozzi and colleagues at the University of Texas at Austin Center for Transportation Research.

The group of 21 visitors toured TTI's pavements and materials laboratories, witnessed a crash test at Riverside Campus and received briefings on SWUTC and TTI activities. In addition to representing several states in the U.S., the attendees included representatives

from transportation entities in New Zealand, Chile, Canada, Peru, South Africa, China and India. The crash test, conducted by Dr. Dean Alberson, involved bollards manufactured by an Italian company.

The program prepared by SWUTC and TTI researchers including Tom Scullion, Gene Buth and Stacy Hilbrich provided the guests with a memorable set of experiences that increased their knowledge of the transportation profession and polished the worldwide reputation of SWUTC and TTI's researchers and facilities.

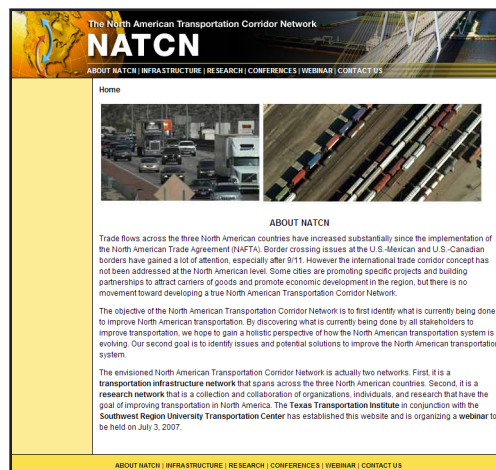
North American Transportation Corridors Conducts Webinar

SWUTC Project #473700-00091/P.I. Juan Villa

Trade flows across the three North American countries have increased substantially since the implementation of the North American Trade Agreement (NAFTA). Border crossing issues at the U.S.-Mexican and U.S.-Canadian borders have gained a lot of attention, especially after 9/11. However the international trade corridor concept has not been addressed at the North American level. Some cities are promoting specific projects and building partnerships to attract carriers of goods and promote economic development in the region, but there is no movement toward developing a true North American Transportation Corridor Plan.

On July 3rd the research team organized a webinar with 15 transportation experts representing the U.S., Canada and Mexico. During the webinar discussion centered around what is currently being done to improve transportation infrastructure in North America and identify key issues regarding expanding and improving North American transportation infrastructure. Four presentations were also made titled *Intermodal Transport Between Mexico and North America*; *Toward one North American Transportation Market: The Open Praries Proposal*; *North American Transportation from the Canadian Perspective* and *A North American Transportation Infrastructure Strategy*.

Also during the past year, the North American Transportation Corridor Network website produced by this SWUTC initiative became active at <http://natcndev.tamu.edu/>. This website's objective is to publish documents, presentations, papers and workshop discussion notes to interested individuals.



Deer-Vehicle Crash Information and Research Center

SWUTC Project #167170/P.I. Keith Knapp

Website: <http://www.deercrash.com/>



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

The members of the Pooled Fund Project are department of transportation employees from Connecticut, Iowa, Maryland, Minnesota, New Hampshire, New York, Ohio and Wisconsin. Those states, along with the Federal Highway Administration, have

pooled their funds and have assembled more than \$300,000. The Southwest Region University Transportation Center and Center for Transportation Safety at TTI are supporting sponsors of the project.

SWUTC Education Efforts Highlighted in *Texas Transportation Researcher*

In the Fall 2006 issue of the *Texas Transportation Researcher* published by the Texas Transportation Institute, several SWUTC educational programs were prominently showcased as leading initiatives aiding in the development of the transportation workforce of tomorrow. Among the SWUTC successes highlighted were the SWUTC graduate and undergraduate programs, which play a valuable role in training and mentoring students in the university setting. As emphasis to this, three former SWUTC student profiles were presented illustrating the bona fide payoff from the SWUTC education program investment in preparing students for their future careers. Additionally, the Texas Summer Transportation Institute program was highlighted, along with two other SWUTC funded efforts, the You Go Girl! program and the Texas Summer Aviation Academy. All three of these programs are geared to the pre-college level student with the intent to spark their interest in a career in transportation.

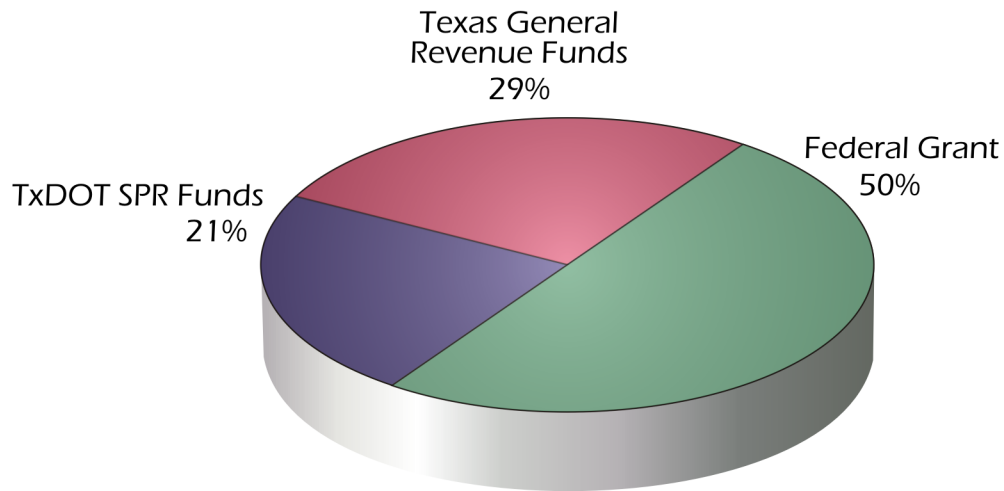


The *Texas Transportation Researcher* is distributed to over 4,000 transportation industry professionals worldwide. A PDF of this document is available on-line at http://tti.tamu.edu/publications/researcher/v42n4/42_4.pdf.

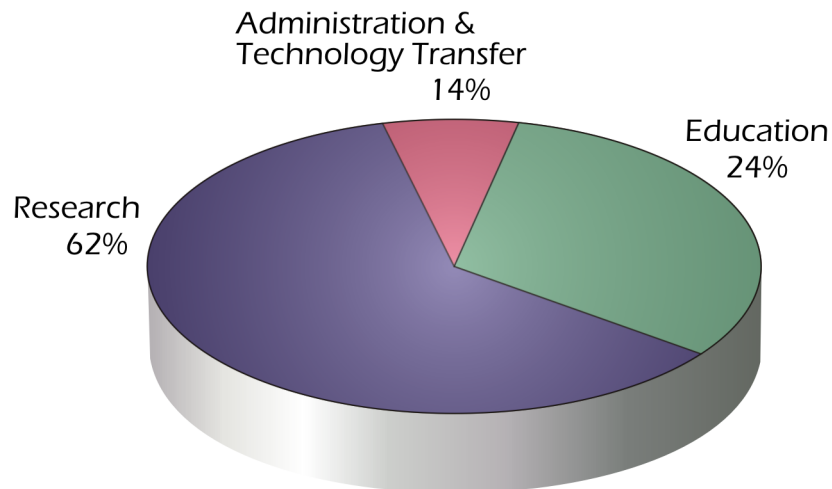
Spotlight on SWUTC Education Program

The SWUTC was one of the University Transportation Center's from AASHTO Region 4 invited to participate in events at the 2007 American Association of State Highways and Transportation Officials Research Advisory Committee meeting in Seattle in early August. Throughout the two day conference, UTC representatives discussed with member state DOT personnel ideas to enhance opportunities for mutual research benefits. The SWUTC participated in the poster session with a presentation entitled *19 Years of Innovation in Research Education and Technology Transfer: Focus on Education and Workforce Development*.

Funding Sources



Expenditures of Funds





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