

2002 Annual Report

Southwest Region University Transportation Center
Annual Report 2002

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

Consortium Members:
Texas A&M University
University of Texas at Austin
Texas Southern University

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Message from the Director



Successful pursuit of our theme ***Transportation Solutions to Enhance Prosperity and the Quality of Life*** requires energized people (both faculty and students) creating dynamic and insightful ideas to generate and capitalize on new opportunities for transportation solutions for our fellow citizens. A dynamic response was called for by the events of September 11, 2001, shortly after the beginning of the academic year. Elements of transportation security were already included in the SWUTC research program, and additional support was provided for researchers to pursue complementary transportation security research programs in the US Department of Defense and other federal agencies. The flexibility of the SWUTC program flows from its educational, research, and technology transfer successes by continually integrating new researchers, new students, and new faculty members into the diversified mix of our programs. Classroom performance, research results, and outreach efforts in the current year created new and exciting outcomes for our participants.

Research

The research program, supporting 52 research and teaching faculty members from the consortium, continues to provide opportunities to develop new ideas advancing the state of transportation science and to introduce students into various technical fields of transportation. Within the theme of ***Transportation Solutions to Enhance Prosperity and the Quality of Life***, SWUTC researchers were active on 28 projects including: developing innovative models to analyze roadway pricing using travel survey data; analyzing traffic safety and speed limits; using survey techniques to analyze current curricula needs in transportation education; developing truck rollover warning/control systems; examining impacts of U.S.-Latin American trade on the Southwest economy...and much more. (See complete listing of new research projects beginning on page 32.)

We continue active, productive efforts to bring new, promising faculty members and researchers into the SWUTC program at each of the consortium universities. Competition among our research faculty members has produced research project

ideas of a quality that has never been higher; and published reports and papers and professional presentations continue to reflect the high quality of peer-reviewed activities that are at the core of the SWUTC's research initiative.

Education

The educational component of the SWUTC has become a showpiece, reflecting the high priority established by the Executive Committee and the real-time needs of the transportation industry. Developing the required pipeline of transportation professionalism begins with interactions with students at the earliest school grades, proceeds through high school into undergraduate education, and then culminates in graduate academic degree programs of various transportation specialties.

During the past year, we in the SWUTC participated in educational outreach to elementary and secondary school children; attracted high quality undergraduates to our campuses to participate in various mentoring initiatives; recruited some of our best-ever students into the graduate transportation programs of the consortium universities; and graduated imminently qualified young

professionals into the initial stages of their transportation careers.

As elements of the broadened educational programs supported by the SWUTC, expanded educational outreach efforts attracted elementary and secondary school children to participate in the Summer Transportation Institute programs at Houston (TSU) and Dallas (Paul Quinn College). (A similar program prepared for presentation at Palo Alto College in San Antonio had to be cancelled because of unseasonable and devastating torrential rains in the San Antonio region). These summer agendas have proven to be highly successful at identifying and recruiting high school students as potential professionals in the transportation industry of the near future. Further “upstream” in the pipeline, SWUTC researchers developed a transportation road show library of transportation teaching materials that was made available at career fairs around the state. These activities, along with sponsorship of transportation science fair, bring transportation concepts to an increasingly younger segment of the student population.

The Advanced Institutes at Texas A&M University and the University of Texas at Austin make it possible to pursue new initiatives in transportation education that recruit new talent into the field and expand the range of issues addressed by transportation professionals. SWUTC’s undergraduate activities (notably the summer fellows program) continue to provide important linkages with undergraduate programs across the U.S. as sources of potential graduate students in the Advanced Institutes. The educational program at TSU was enhanced through the award of SWUTC-funded fellowship/scholarship stipends for qualified graduate and undergraduate students pursuing transportation studies.

Of all our ninety four students, Mr. Steven Schrock, a doctoral student at Texas A&M, was selected to receive the prestigious **Robert Herman Award** as the Outstanding Student in the SWUTC. Mr. Schrock’s doctoral studies focused upon work zone safety. University of Texas at Austin student, Mr. Nathan N. Huynh received the SWUTC’s award as the **Outstanding Doctoral Student Award** for his analyses of methods for improving the consistency of simulation-based dynamic traffic models. This

year, SWUTC’s recently established **Naomi Ledé Outstanding Masters Student Award** was presented to Ms. Teresa Frusti of the University of Texas at Austin, who is pursuing a degree in Civil Engineering.

The educational programs are attracting better students (at all levels) and graduating better trained professionals than ever. Our graduates are making successful careers already in all aspects of the transportation sector. The mentors programs, summer undergraduate education enhancement, and Advanced Institute activities at UT and TAMU, and the graduate/undergraduate transportation studies programs at TSU continue to produce a mix of educational solutions that are exciting and productive in providing new leaders for the transportation industry.

Technology Transfer

In SWUTC’s menu of technology transfer techniques, we feature conference/workshops, seed money for spin-off engagements, and the production, publication and presentation of new knowledge in various professional venues.

SWUTC sponsored two important transportation meetings in the state during the year: 1) the “Transit-Oriented Development (TOD) Workshop” at TSU brought more than 100 persons together to discuss TOD requirements and potential opportunities for TOD in the Houston urban area, and 2) the “Texas Rural Transportation Conference” held at Laredo featured a daylong discussion of workforce development and transportation issues. Topics included transportation for isolated *colonias* neighborhoods, home-to-work transportation service in rural Texas, and regional policy issues in workforce development.

We think that some of the unique aspects of our technology transfer program are manifested in “spin-off” activities that arise as a direct result of support initially provided by SWUTC. Presently, some of these include: 1) Dramatized by the terrorism on 11 September 2001, transportation security has become an essential element in providing for a complete concept of Homeland Security. SWUTC-funded researchers are presently pursuing complementary research and development

initiatives, which, if successful, will bring focused multi-departmental funding to Texas to support a variety of Homeland Security elements; 2) Summer Transportation Institutes — The summer transportation initiative has relied on SWUTC funding for initializing and expanding some of the activities in this dynamic program. Currently, researchers in TTI and TSU have secured independent grants and funding to sustain the STI program into the foreseeable future; 3) Center for Ports and Waterways — This center, established in TTI, is a focus for research, education, and service activities for the maritime sector of the Texas Gulf Coast. Seed

funding from SWUTC has been essential to establishing the sustainability of this initiative.

Much of our technology transfer activities continue to depend on the individual efforts of faculty members and professional researchers to present their research results in various forms such as technical reports, scholarly publications, and professional presentations. SWUTC has become a visible leader in these activities. To date, SWUTC researchers have produced 223 technical reports, 235 refereed papers, and 645 presentations.

The Future

We continue to strengthen the SWUTC relationships within the existing consortium of the Center, its ancillary programs, and our newly established partnerships. The long-term vibrancy and health of the SWUTC are directly tied to the high performance of both the professional staff and student body in executing our research, education, and technology transfer programs. We intend to continue exploring and explaining the frontiers generated by our knowledge production processes.

Stable and growing funding in both federal and state supporting budgets continues to be a high management priority to establish the administrative platforms for programmatic success in the SWUTC. Unrestored budgetary reductions present real-time difficulties to the intended and expected fulfillment of the UTC vision, and we will find sustainable solutions to overcome this threatening condition.

We in the SWUTC look forward to participating in the discussions at the national level to define and support an expanded UTC program in the upcoming reauthorization of TEA-21. Such a program is needed and demonstrably effective in preparing the nation's transportation industry for the challenges that are already "on the screen", including the overwhelmingly important question: how will we replace the retiring transportation professionals with trained and well-prepared younger cohorts in the workforce?

It is my contention that the SWUTC and the rest of the UTC program are necessary elements in providing the right answer to that and other pertinent questions that will determine the success of our industry into the future.

Dock Burke
Director

Theme and Vision

The SWUTC theme

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

clearly challenges SWUTC participants to expand their capacities to the fullest to produce education, research, and service solutions to transportation issues facing the people of Region 6 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.*

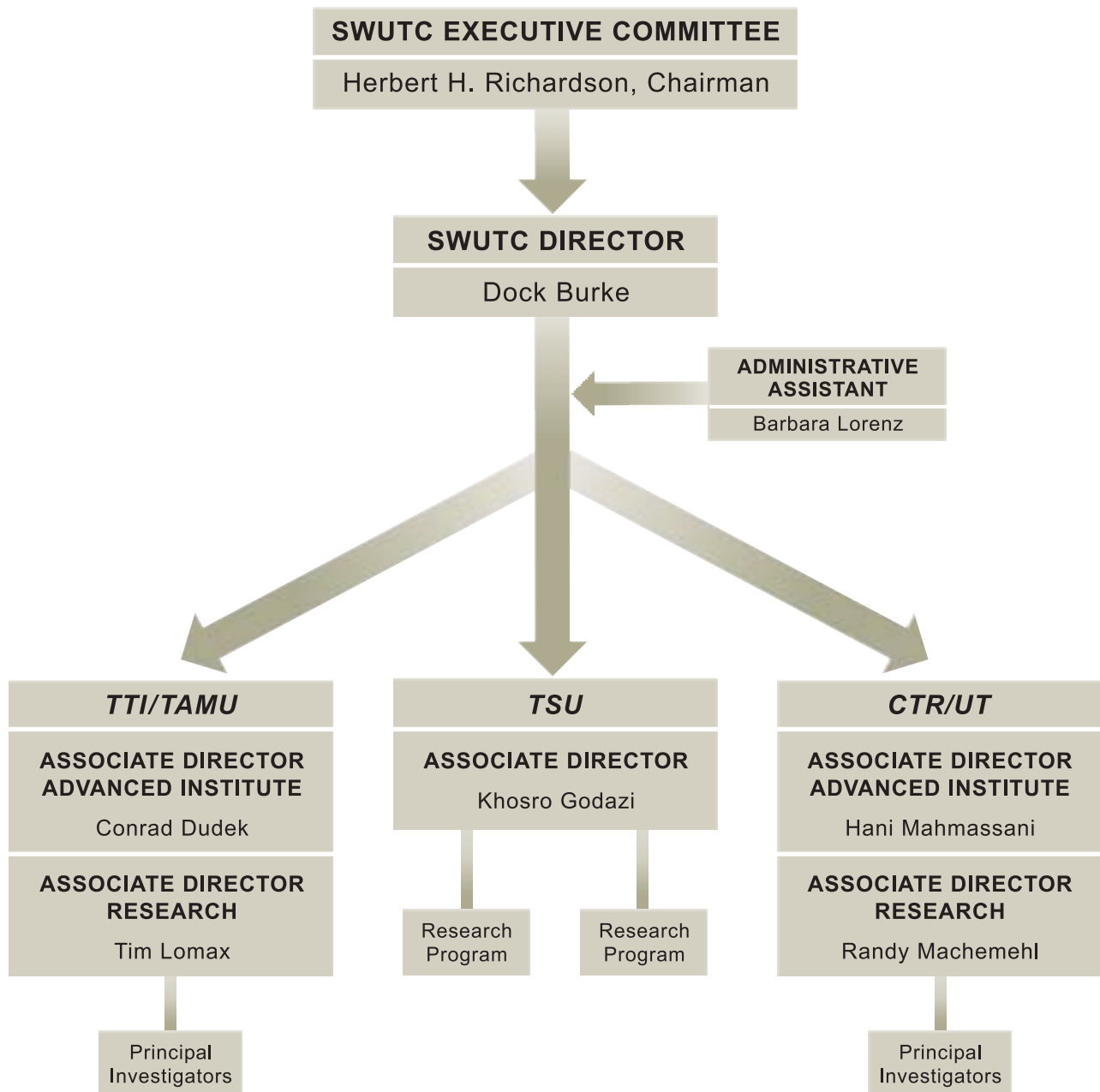
This ambitious vision calls upon us, over the expected lifetime of this UTC grant, to deliver premier research programs in transportation systems, transportation education and professional workforce development, and transportation technology transfer and service. We will pursue this vision by building 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.



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 Assistant and five Associate Directors - two at TAMU/TTI, two at UT-Austin/CTR, and one at TSU/CTTR. These Associate Directors are each responsible for administering that portion of SWUTC's activities in their charge.



Key Center Personnel

SWUTC Executive Committee



Dr. Herbert H. Richardson, chairman

Dr. Richardson is currently Director of the Texas Transportation Institute and Associate Vice Chancellor for Engineering in the Texas A&M University System, and also holds appointments

as Regents Professor and Distinguished Professor of Engineering in Texas A&M University. He is a member of the National Academy of Engineering, Honorary Member of the American Society of Mechanical Engineers, and Fellow of the American Association for the Advancement of Science. He served as the first Chief Scientist of the U.S. Department of Transportation, as Chairman of the Transportation Research Board, and has led or participated in numerous TRB panels, study committees, and review boards. He served for 6 years on the Governing Board of the National Research Council and the Council of the National Academy of Engineering. Most recently he received the Lamme Medal of the American Association for Engineering Education for leadership in engineering education.

Ms. Penny Beaumont, member

Ms. Beaumont is Associate Agency Director of the Texas Transportation Institute and holds the same position in the Texas Engineering Extension Service (TEEX). Her primary responsibilities for TTI include state legislative strategy development and implementation, as well as special projects for the Director and the Executive Associate Director. During her one-year appointment for TEEX, she is developing a legislative strategy for the agency, and reviewing all TEEX communications activities in order to propose a revised communications organization and plan. Prior to joining TTI, Beaumont served as Vice Chancellor for Communications and Development of the Texas A&M System, the first woman to hold vice chancellor rank in the System. Coordinating legislative

communications for the 15-member A&M system was a primary responsibility in that job, as was ongoing interaction with the legislative leadership in Austin, and with the Texas Congressional delegation.

Ms. Beaumont has been involved in technology policy development and legislative affairs since 1986. From 1987 until 1991, she served as the TAMUS Engineering Program's liaison to both the state legislature and Congress, securing funding for a number of engineering/transportation initiatives. She was founding member of the Technology Industry Legislative Task Force in 1986 and participated in a major industry/university legislative initiative, which secured passage of 11 major bills that changed the structure of university-based research and technology transfer.

Mr. G. Sadler Bridges, member

Mr. Bridges has more than twenty years of experience in transportation research. His research has included urban transportation, bus operations, high occupancy vehicles, and fixed guide-way transportation. Mr. Bridges managed the 1970 and the 1972 National Transportation Studies for Texas, directing the efforts of several state agencies and twenty-three urbanized areas in Texas, and was its principal author. He was a member of the Mobility 2000 Group on the application of advanced technologies to vehicles and highways. The technologies include advanced traffic management techniques, onboard navigation systems, and advanced vehicle control systems. He co-edited the Mobility 2000 reports of the meetings in San Antonio in 1989 and Dallas in 1990. He was a founding member of ITS America, a designated advisory commission to the U.S. DOT on ITS issues. He has served on the Membership Committee, the Coordinating Council, the Planning Committee, and as chair of the Institutional Issues Committee. Coincident with Mr. Bridges' appointment to an administrative position his primary attention turned from technical research to concentrate on management. During his tenure as Interim Director TTI was designated as one of three Research Centers of Excellence in ITS. One of his continuing administrative goals is to expand TTI into new technologies and new disciplines of transportation. The expansions into new technologies lead to his assuming leadership of the ALERT project returning him to active research. He used

the ALERT project as a springboard to commence TTI's Intelligent Vehicle Initiative. Currently he serves on several SAE ITS Standards committees and is chair of the Public Safety Vehicle Committee.

Dr. Dennis Christiansen, member

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

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

Dr. Susan Handy, member

An Associate Professor, Community and Regional Planning, University of Texas at Austin. Dr. Handy is a product of the UTC graduate program in City and Regional Planning from the University of California at Berkeley where she received her Ph.D in 1992. Dr. Handy's research focuses on accessibility issues in transportation, especially alternative strategies for providing needed accessibility, including land use policies and telecommunications services. Her research for the Southwest Region University Transportation Center has included: a

project to develop practical methodologies for measuring accessibility at the neighborhood level using Geographic Information Systems and to evaluate accessibility needs in low-income neighborhoods; a three-year project on the relationship between urban form and travel behavior; and a project on the question of whether telecommunications technologies will lead to the substitution of in-home activities for out-of-home activities. She has served for a number of years on the Land Development Subcommittee and the Telecommunications and Travel Behavior Subcommittee of the Transportation Research Board.

Mr. Robert Harrison, member

Mr. Harrison is a Senior Research Scientist and Executive 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. He 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..

Mr. Harrison is a past president of the U.S. Transportation Research Forum (TRF), and currently serves as an Associate Editor of the TRF quarterly publication. He is currently a member of the Transportation Research Board Committee on Motor Vehicle Size and Weight, serves as Secretary of the TRB Committee on International Trade and Transportation, serves as Secretary to the Task Force on Agricultural Transportation, and is the Chairman of the Committee on Intermodal Freight.

Dr. Carol Lewis, member

Carol A. Lewis is an Associate Professor in Transportation Studies and Director of the Center for Transportation Training and Research at Texas

Southern University. In this capacity, 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 joining the Texas Southern University faculty in 1992, she has conducted research for the Texas Department of Transportation, the Southwest Region University Transportation Consortium, Federal Highway Administration and others. Examples of recent publications include Smart Growth in Southwest States, Impacts of Freeway Ramp Locations on Land Use and Development, and Socio-economic and Land Value Effects of Elevated and Depressed Freeways. Lewis also assisted with the citizen involvement portions of Major Investment Studies for the Metropolitan Transit Authority (Houston) and TxDOT.

Dr. Lewis was recently appointed to the Board of Directors of the Metropolitan Transit Authority of Harris County by Mayor Lee P. Brown. She also chairs the Technical Advisory Council for the Metropolitan Planning Organization and serves on the Technical Advisory Panel for TxDOT. She is a member of a number of professional organizations including the American Red Cross Transportation Advisory Committee. Since becoming CTTR's Director, Dr. Lewis had the pleasure of accepting two outstanding research awards. The first was from the Austin Metropolitan Business Council and the second from the Conference of Minority Transportation Officials.

Dr. Laurence Rilett, member

Dr. Rilett is the E.B. Snead II Associate Professor in the Department of Civil Engineering at Texas A&M University, and an Associate Research Engineer at the Texas Transportation Institute. He received his B.A.Sc. degree (1987) and his M.A.Sc. degree (1988) from the University of Waterloo and his Ph.D. degree (1992) from Queen's University. He has held academic positions as an Assistant Professor (1992-1995) and an Associate Professor (1995) at the University of Alberta. In the past 11 years he has taught seven different undergraduate courses and four different graduate courses that cover a variety of topic areas including statistics, risk analysis, and transportation planning. He has served as chair on 6 Ph.D. dissertation committees

and 17 Masters committees and is currently supervising 8 Ph.D. students and 6 Masters students. In addition, he has authored or co-authored 32 refereed journal papers and 40 conference papers that were based on his research.

Dr. Rilett has been a principal investigator or co-principal investigator on over 20 research projects. Dr. Rilett's field of research is in the transportation system analysis area and his specific research may be divided into two main areas: ITS applications and transportation system modeling.

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 and former Chairman of TRB. He is a founding member of the Intelligent Transportation Society (ITS) of America and currently serves as chair on the Board of Directors. Dr. Walton has received awards including the 2000 George S. Bartlett Award in recognition for outstanding contributions to highway progress. He was selected by a Board of Award comprised of the President and Executive Director of each of the three sponsoring organizations—American Association of State Highway and Transportation Officials (AASHTO), TRB and ARTBA. The Bartlett Award is unusual in that it is the only award jointly sponsored by the three organizations and is considered to be among the highest honors in the highway transportation profession. The American Society of Civil Engineers presented him with several awards including 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. Lei Yu, member

Lei Yu is Professor and Chairman of the Transportation Studies Department at Texas Southern University. As a professor at Texas Southern University, he has been teaching the courses in Highway Traffic Operations, Travel Demand Forecasting & Analysis, Transportation Design & Engineering, Computer Applications in Transportation, and Quantitative Analysis in Transportation. His research interests and expertise involve transportation modeling, the ITS related technologies and applications, dynamic traffic assignment and simulation, vehicle exhaust emission modeling, highway traffic control and operation strategies, travel demand forecasting models, and air quality issues in transportation. In the past years, Yu has been the Principal Investigator of more than 25 research projects that were sponsored by various agencies such as Texas Department of Transportation (TxDOT), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Southwest Region University Transportation Center (SWUTC) program, National Institute of Standards and Technology (NIST), City of Missouri City, Harris County Improvement District #1, etc. Dr. Yu has published more than 50 research papers in scientific journals and conference proceedings, and project reports. In addition, he has served many times as the distinguished

lecturer for the high-level Chinese Transportation Executives and Administrators. In September 2000, he was awarded the Cheung Kong Scholar 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 also holds membership on numerous committees, councils, and task forces in the regional, state, national and international organizations.

Dr. Zhanmin Zhang, member

Dr. Zhang is an Assistant Professor in Transportation Engineering at the University of Texas at Austin. He obtained his Ph.D. at the University of Texas at Austin and has significant teaching and research experience elsewhere. Dr. Zhang has been actively conducting research in the engineering and management of transportation infrastructure and the applications of advanced database and information systems to pavement management for more than 16 years here in the United States and abroad.

Dr. Zhang's research experience is characterized by a unique combination of his theoretical knowledge in pavement engineering and hands-on computer skills. He has conducted extensive research in the analysis, modeling, operation, and management of pavement and infrastructure systems, using advanced computer technologies such as Geographic Information Systems (GIS), knowledge-based systems (KBS), and relational database management systems (RDBMS).

Dr. Zhang is actively involved with several professional committees under the Transportation Research Board (TRB) and American Concrete Institute (ACI). He also serves as a member of the Technical Advisory Panel (TAP) for the Research Management Committee (RMC) 1 of the Texas Department of Transportation (TxDOT).

Office of the Director

Dock Burke, Director

Dock Burke is the Director of the Southwest Region University Transportation Center at the Texas Transportation Institute. A Senior Research Economist, he also coordinates the activities of TTI's regional divisions. In his research career at the Institute, he has served as the Study Supervisor or co-supervisor of 56 research projects, authored or co-authored 91 research reports and papers, and has made 68 presentations on a wide variety of transportation related issues since joining the TTI in 1969. He is the 1998 recipient of TTI's prestigious *TTI/Trinity Career Achievement in Research* award.

Barbara Lorenz, Administrative Assistant

Barbara Lorenz serves as Administrative Assistant in the SWUTC a position she has held since 1992. Ms. Lorenz oversees the daily operational activities of the Center.

SWUTC Associate Directors

Dr. Conrad Dudek, Associate Director - Advanced Institute, Texas A&M University

Dr. Dudek has taught transportation engineering courses in Civil Engineering for 35 years. He has over 40 years experience in transportation research. He has administered civil engineering undergraduate and graduate programs in transportation engineering. He has served as Program Manager, Project Director, Principal Investigator, Principal Researcher, or Study Supervisor on over 50 research projects sponsored by state and federal agencies.

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

New to the management of the SWUTC, Dr. Lomax is a Research Engineer at the Texas Transportation Institute and Manager of the Mobility Analysis Program. Dr. Lomax is known for his efforts to quantify urban mobility problems and communicate them 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.



Tim Lomax

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

Mr. Godazi, Associate Director for the SWUTC, has 15 years of teaching and administrative experience at Texas Southern University. He holds a BS in Civil Engineering Technology and a MS in City Planning. He is coordinator of the 2-week Texas Summer Transportation Institute that has been held in Houston, at Texas Southern University. In addition he spearheads the Transportation Studies Mentorship Program. Mr. Godazi has coordinated numerous conferences for the Center for Transportation Training and Research. Mr. Godazi has extensive experience in transportation research and has served as Principal Investigator on numerous SWUTC projects. Mr. Godazi teaches transportation students in various Transportation Software and Quantitative Statistics.

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. In addition to these duties, Dr. Machemehl has distinguished himself as a researcher focusing particularly on transportation system operations and he has published over 150 papers and reports. 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 and the Transportation Research Forum. He is a retired U.S. Army Reserve Corps of Engineers officer.

Dr. Hani Mahmassani, Associate Director - Advanced Institute, UT-Austin

Dr. Mahmassani is the Adnan Abou-Ayyash Centennial Professor in Transportation Engineering, and Professor of Management Science and Information Systems in the Department of Civil Engineering at the University of Texas at Austin. He has 25 years of teaching and research experience in the field of transportation. He currently teaches courses in the analysis and design of transportation systems, traffic system performance and control, decision models and operations research. His numerous professional activities include being past president of the Transportation Science Section of INFORMS, President of the International Association of Travel Behavior Research and Associate Editor of *Transportation Research C: Emerging Technologies*.

Education Program

Transportation education is an essential process in developing a workforce with the skills and leadership qualities to guide the transportation industry of the future. This investment in human capital creates a “pipeline” process which takes in students at secondary school levels, adds high school and bachelorette programs and culminates in graduate specialities in transportation science and engineering.

The SWUTC supports Advanced Institutes 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. 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.

Selected Education Highlights

SWUTC Takes Transportation to the Schools

SWUTC Project #167423/ P.I. Debbie Jasek

An educational program with the goal of advertising career options in the field of transportation is hitting the road. The transportation road show library, developed with SWUTC funding, provides teaching materials about various forms of transportation to high school teachers, and promotional materials to junior high, high school and adult audiences to encourage careers in transportation.



Students check out transportation career options at Laredo Career Days

modules are PowerPoint presentations, videotapes, activities, brochures and a listing of interactive web sites. Once fully developed, the exercises, activities, and presentations will be placed on the internet for widespread distribution to educators across the country.

“If a teacher calls us and wants to do a presentation on trucks, then our goal is to provide them a list of resources that we have available for them,” says Debbie Jasek. “Then they can use a combination of components depending on their needs.”

“A lot of students are not aware of all the different job opportunities available in the field of transportation”, says Susan Larson, math specialist with the Texas Rural Systemic Initiative. “By introducing students to these opportunities, the SWUTC gives them better insight into what they can pursue for future careers. A lot of the teachers tell me that when they teach the topics, the students are just amazed at how often transportation affects our lives.”

SWUTC researchers are currently working toward constructing self-contained teaching modules for the library. The modules cover transportation-related topics such as trucks, bridges and space exploration. Included as components of the

Another function of the library is to provide transportation professionals quality materials when they talk to students in classes or career fairs. By having the materials organized in a one-stop clearinghouse, researchers can easily identify the resources they need for their presentations.

Jasek believe that the road show library is a great resource for transportation professionals and especially for students. "We want to answer the questions, 'what do engineers do...what do transportation professionals do?' And hopefully some of them will decide that this would be a neat thing to do as a career!"

During the past year the road show materials and transportation modules have been presented at many schools and various events and career fairs such as the Expanding Your Horizons event for 12 year old girls, the Texas Best Competition, the TxDOT Laredo Career Days Fair, and the Texas Junior Academic Science Fair.

Houston National Summer Transportation Institute Promotes Careers in Transportation

SWUTC #167420/P.I. Khosro Godazi

The Center for Transportation Training and Research at Texas Southern University in cooperation with the SWUTC sponsored its first four week Houston Nation Summer Transportation Institute (HNSTI) from June 3-28. A total of twenty eight high school students from Houston and surrounding areas participated in the program. Primarily, the HNSTI emphasizes both the quality and quantity of students selecting transportation careers. The HNSTI is designed to create an education and training delivery system that will: attract secondary students to and enhance their interest in careers in transportation; improve mathematics, science, and technology skills; and through creative partnerships, strengthen the links between the transportation sector and public/private institutions.



2002 HNSTI Student Participants

The HNSTI specifically focuses on creating high interest among secondary school students and creating opportunities and activities that will enhance awareness and knowledge about transportation careers. The four-week institute addressed the three modes of transportation (air, land, and water) and augmented this knowledge with educational interactive activities including trips to TranStar, Houston METRO, the Port of Houston and the Texas Transportation Institute.

Response to the new program has been overwhelmingly positive.

"The Houston TSTI Program at TSU was definitely a learning and growing experience for me. The Houston TSTI program broadened my awareness of careers in transportation that I did not know. I enjoyed the field trips we went on because I really did not know a lot about Airway Science, but through this program I gained knowledge and education in transportation. Also, I truly enjoyed the Intership I did at the Houston Ship Channel. Finally, meeting students of my peers from other area high schools was definitely a plus in this program." - Stevi T. Hooper

"As the parent of Stevi T. Hooper, I was truly grateful that the TSU/TSTI program gave my daughter the opportunity to participate in this program for various reasons 1) learning experience 2) gaining self-confidence in herself 3) that there are other career opportunities in other fields and 4) keeping students focused on their education in the sciences and math-the wave of the future. Thank you TSU/TSTI program staff for your support of the students. Keep up the good work." - Deloris Mason-Hooper, Parent

Transportation Science Fair Produces Unexpected Collaboration

SWUTC Project #167123/P.I. Debbie Jasek

On April 11, 2002, the Texas Transportation Institute in cooperation with the SWUTC hosted a transportation science fair on the Texas A&M University campus. "The idea behind the science fair was to provide outstanding junior high and high school students an opportunity to present transportation-related research findings and ideas in a professional arena," says Debbie Jasek.



The Conroe Team (Megan Schultz, Justin Kooker, and Brian Sims)

Winning entries were from Conroe Academy of Science (senior division) and Jane Long Middle School (junior division). The Conroe Academy of Science team designed an airport at sea. The airport included a transit tunnel to the shoreline and an artificial reef to reduce wave action. Terry Anderson had the winning entry from Jane Long Middle School. His project focused on bicycle safety.

As a result of the success of and interest created by the Transportation Fair, the Texas A&M University College of Science, which has

sponsored the Regional Brazos Valley Science and Engineering Fair (BVSEF) for the past 27 years, agreed to collaborate with the SWUTC to encourage transportation-related science fair entries. This event promotes original research and experimentation in the sciences, engineering and mathematics at the secondary school level (grades 7-12) and publicly recognizes students for outstanding achievement.

This year, the first collaborative efforts have resulted in the establishment of a special SWUTC-sponsored, BVSEF transportation-related project award—given at both the high school and junior high levels. The high school award went to Colby Samford and Eric Clapp of North Zulch High School. Colby and Eric, both 9th graders, built a boat that can pull up to 200 pounds of dead weight for 300 feet. The junior high school award went to Kenny Bendickson of College Station Middle School for a project on the "Effects of Lane Configuration on Traffic Flow."

The College of Science has also agreed that the SWUTC can participate in all of their other sponsored events. "This is a very big deal," explains Debbie Jasek. "The effort can be carried on for years to come at minimal cost. Additionally, it promotes transportation science right up there with meteorology, physics and all the other sciences," Each year 30-40 schools are involved in this regional fair. Winners go on to state and national events. This newly established collaborative relationship will enable the SWUTC to promote transportation science by providing speakers, information, judges and tours of its transportation research facilities.



Terry Anderson had the winning entry from Jane Long Middle School. His project focused on bicycle safety.

Research Findings Aid in the Education of Transportation Professionals

SWUTC Project #167222/P.I.: Susan Handy

The practice of transportation planning at the regional level has evolved substantially over the past several decades. Once defined as largely a technical exercise, transportation planning now encompasses a wide range of sometimes conflicting problems and demands. But, are the curricula in the planning and engineering programs that educate and train transportation professionals adequately preparing them for these new challenges? Dr. Susan Handy's research project "The Education of Transportation Planning Professionals" has generated recommendations for improvement in the education of transportation planners. The study addressed three general questions. What skills and knowledge do today's transportation planners need? What skills and knowledge are planning and engineering programs providing? And how well do these match? Such a comparison would highlight areas for improvement and suggest ways to enhance the education of transportation professionals.



UT-Austin graduate students tour City of Austin Traffic Control Center.

Utilizing an on-line survey administered during the summer of 2001 to members of the *American Planning Association* (APA) Transportation Planning Division and members of the *Institute of Transportation Engineers* (ITE) Planning Council, and interviews with selected transportation planning educators and professionals, areas for improvement in transportation planning education were identified. The most striking survey result was the importance of public involvement and communications skills. However those respondents with Masters Degrees in Engineering stated that those skills were not covered in their degree programs and/or were rarely the focus of an entire course. On the other hand, respondents with planning degrees are often missing out on the development of technical skills. The survey results also point to a lag between the changing transportation planning environment and the content of transportation planning curricula. Topics of

new importance to the field of transportation planning including such issues as environmental justice, Americans with Disabilities Act, air quality conformity, bicycle and pedestrian planning, environmental and sustainability were largely absent from current curricula. This suggests a need for strong and respectful links between the transportation professionals and educators.

These and other findings and recommendations are available in the final report generated by this study entitled *The Education of Transportation Planning Professionals* - Report number: SWUTC/02/167222-1.

Additional SWUTC Sponsored Education Programs During 2001-2002

Summer Undergraduate Fellows Program

The SWUTC Summer Fellows Program at the University of Texas and Texas A&M University continue to be extremely successful in recruiting a diverse group of students into the graduate programs in transportation. The Summer 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.

“The actual practical experience you get out of looking at a problem from a research perspective is one of the best features of the program,” said Jeff Miles a Summer 2002 Fellow. “We research a real life problem in great detail, as opposed to a classroom where we might just touch on a subject.”

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

TAMU Mentors Program

During the summer of 2002, the SWUTC Advanced Institute at Texas A&M University conducted its 12th Annual Mentors Program. Eleven graduate students and state DOT employees participated in the program that brings students together with recognized experts in the fields of traffic operations, traffic management and intelligent transportation systems (ITS).

“I feel very strongly that one of the things missing in many educational programs is the opportunity for students to hear how it is in the real world from the practitioners,” says David Roper, who was among the first mentors in 1990. “The Mentors Program brings the students and practitioners together not only in a university setting, but also in a less formal setting, like having meals together and working on the student’s project.”

Each year, the program begins with a three-day session on TAMU’s main campus and continues through the summer as participants work on selected transportation topics. The participants work with the mentors and class instructor to research and develop their ideas into papers and presentations.

Near the end of the summer academic session, mentors and DOT employees return to the campus for formal presentations of the papers by the participants. Final papers are compiled and published in a compendium. Many students have had papers accepted for presentations at professional national and international meeting.



Student Participants in the 2002 TAMU Mentors Program

Texas Summer Transportation Institutes

For the fourth year, the SWUTC has provided support for the highly successful Texas Summer Transportation Institute (TSTI) hosted by the Texas Transportation Institute, Paul Quinn College and the University of Texas-San Antonio. The two-week institutes are held in the Dallas and the San Antonio area. The TSTI program recruits primarily minority high school students to help them find a career direction. The program's secondary goal addresses the need for transportation professionals in the future.

Students receive training in math, science and technology in all modes of transportation. By showing students what transportation means to the country, TSTI instills in them a sense of mission and responsibility toward their own career choices.

This year's activities included: tours of transportation facilities, including airports and transit agencies such as Dallas Area Rapid Transit (DART); presentations on various aspects of the transportation industry and its initiatives, such as Operation Lifesaver; and interactive exercises, such as visits to the U.S. Air Force and Coast Guard.

During the program's first three years, 124 students participated. A little over 56 percent have graduated from high school, with the remaining still in school. All the graduates entered college, with a majority aiming to pursue careers in mathematics, science, business, technology and transportation engineering. Some of these students have entered the Texas A&M University engineering program, several are pursuing careers in aviation, and about 10 percent have passed exams to become licensed pilots and air traffic controllers.



Students tour TTI's proving grounds to view crash tests and see how safety features are built into the roadside.

Jonathan Garza, a student in Houston, credits the support of his parents and the TSTI program with helping him to realize the importance of education to his future. He now holds a private pilot's license and is a Presidential Scholar. Garza has returned to mentor students currently participating in the TSTI program.

"The TSTI program is truly a great opportunity for any student, especially one who is looking for a career in transportation," says Garza. "I have decided because of TSTI that I will attend the Airway Science Program at Texas Southern University."

The SWUTC provides direct financial support for marketing products, like the web site at <http://tsti.tamu.edu>. These products promote TSTI to students, parents and high school counselors.

STUDENT AWARDS

External Award Received by SWUTC Students

One of the most gratifying accomplishments this year were the number of external awards received by MS theses and dissertations completed by University of Texas graduate students, through research partially or wholly funded through the SWUTC. Notable among those is the dissertation of Dr. Karthik Srinivasan, supervised by Advanced Institute Associate Director, Dr. Hani Mahmassani, which won the *Eric Pas Memorial Best Dissertation Award* of the International Association for Travel Behavior Research. And the MS thesis of Aruna Sivakumar, supervised by Dr. Chandra Bhat, which won the 2001 *Milton Pikarsky Memorial Award*, given to the best transportation MS thesis in North America in the Science and Technology category. The award is made by the Council of University Transportation Centers (CUTC) and was presented at a reception in Washington, D.C., in January 2002.

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 SWUTC Ph.D. Student Award and the Robert Herman Outstanding Student Award comes with a \$1,000 cash award.

For 2002, the **Robert Herman Outstanding Student Award** went to Steven Schrock from Texas A&M University. Steven received this award in recognition of his exceptional leadership skills, academic performance and research accomplishments while pursuing his doctoral degree in Civil Engineering. Steven is a member of the honor societies Chi Epsilon, Phi Kappa Phi, and Tau Beta Pi. Employed at the

Texas Transportation Institute, Steven has conducted research projects in the analysis of work zone fatalities in Texas, development of policies improving the use of highway advisory radio systems, understanding the information needs of motorists in managed lanes, and the development of horizontal signing in advance of hazard locations. Through his work on these projects, Steven expects to improve safety for Texas' motorists in work zones and other potentially hazardous locations.



Steven Schrock accepts SWUTC Robert Herman Award at TTI day.

Teresa Frusti from the University of Texas at Austin was selected as the winner of the 2002 **Naomi Ledé Outstanding Master Student Award**. Teresa was selected to receive this award because of her intense spirit of curiosity and life-long learning. Through the work on her thesis, that focused on the rhythms in individual and household activity-travel patterns over

a period of several weeks, Teresa demonstrated intellectual creativity, good organization, a commitment to intense study, and excellent verbal communication skills. She has tremendous positive energy, and is committed to contributing to her profession and to society at large. Teresa will certainly become one of the leaders in the transportation discipline in the foreseeable future.

The 2002 SWUTC **Ph.D. Student Award Winner** was Nathan N. Huynh from the University of Texas at

Austin. Nathan was selected to receive this award in recognition of his outstanding research record of accomplishments including academic performance, research contributions and service leadership within the program and the profession. His dissertation research, supervised by Dr. Hani Mahmassani, focuses on the design and development of a real-time fault tolerant dynamic network traffic assignment system for online estimation and prediction of traffic conditions. His work, sponsored by the SWUTC program

investigates methods for improving the consistency of simulation-based dynamic traffic models. Nathan represented all of the SWUTC students at the USDOT special awards ceremony in Washington, DC in January 2002. Nathan also received a \$1000 cash award for this honor.



Nathan Huynh receives award at USDOT Student Award Ceremony

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.

Selected Research Highlights

SWUTC Research Team Makes Progress Toward Onboard Rollover Warning and Control System

SWUTC Project #167125/P.I.: Reza Langari and James Ochoa

In 1999, 13 percent (5,362) of all fatalities involved a large truck. Rollover was a factor in 4 percent of the fatal crashes and 3 percent of the nonfatal crashes involving large trucks. Urban freeways are particularly vulnerable to this kind of crash due to their high traffic volumes and the number of curves, ramps and merges. These accidents are often preventable, and most agencies currently address the problem through signage or other traffic control measures.

Technology developed by a team of SWUTC researchers could make them even more preventable. The approach would build the prevention right into the truck itself. With intelligent systems built in, the truck's onboard system could react directly to dangerous conditions, much like anti-lock brakes and airbags do now.



"The problem with external solutions like signs and other devices," explains James Ochoa, "is that the driver has to notice and react to them correctly for them to be effective." Through their SWUTC project, the research team devised a sophisticated computational algorithm for an integrated rollover warning and control system. "The onboard network of microcontrollers receives information from sensors and passes it to a central computer in the tractor cab," explains Langari. "The computer then uses an advanced computational algorithm to predict whether or not the vehicle is in danger of rollover, and sends a warning signal to the driver if rollover is imminent, or if necessary, intervenes to prevent an impending rollover."

The successful results of this research effort caught the attention of the National Redi-Mix Association which recently funded an additional project for the application of this technology to address the rollover problems of concrete trucks.

Project Examining the Impacts of U.S.-Latin American Trade on the Southwest Economy and Transportation System Producing Valuable Results

SWUTC Project #167221/P.I. Leigh Boske

The Transportation Equity Act for the 21st Century (TEA-21) stresses the importance of national corridor planning. For obvious reasons, most attention has been paid to the U.S.-Mexico and U.S.-Canada borders. However, Gulf Coast ports (especially the ports of Houston and New Orleans) view Latin American countries as major current and future trading partners that will have important impacts on the Southwest Region's Economic growth prospects and transportation system. And national corridors will be used to facilitate Latin American trade just as they are used for NAFTA-related trade.

For the last three years, Leigh Boske and John Cuttino, through their SWUTC research projects, have examined the role of port networks located along major trade corridors in generating beneficial economic impacts for their surrounding communities and region(s).

Two reports have been published:

The Impacts of U.S.-Latin American Trade on the Southwest Economy and Transportation System: Assessment of Impact Methodologies; and,

The Impacts of U.S.-Latin American Trade on the Southwest Economy and Transportation System: Case Studies of Coffee and Steel on the U.S.-Brazil Corridor

It is the purpose of these two reports to analyze the cumulative economic and transportation impacts of international trade by adopting a case study methodology that delineates trade across a supply chain. To accomplish this task, it was necessary to apply methodological aspects from three different literatures related to transportation and trade, those of economic impact studies (especially port economic impact studies), supply chain logistics, and transportation corridors.

The research was aided by the generous cooperation of the Organization of American States (OAS)—which represents all countries in the Western Hemisphere—the Port of Houston Authority, the Greater Houston Port Bureau, and an assortment of steel and coffee interests. In Brazil, the project could not have been completed without the contributions of steel and coffee companies, port authorities, federal, state, and local levels of government, and the Mercosul Atlantic Corridor Consortium, a nonprofit consortium of trade and transportation interests.

Leigh Boske has been invited to present the research findings at numerous meetings and conferences such as the Annual Meeting of the Texas Ports Association, the Annual Texas Ports and Waterways Conference, the Second Meeting of the Inter-American Committee on Ports of the Organization of American States (OAS), the Hemispheric Conference on Vulnerability Reduction in Trade Corridor Development, and the Annual Conference of the International Association of Maritime Economists.

In addition, the Organization of American States (OAS) requested 30 copies of the SWUTC research reports to distribute to port authorities of member countries. And the LBJ School of Public Affairs has been invited to become an institutional member of the OAS' Inter-American Training and Research Program for Trade Corridor Development.



Finally, after introducing the concept of Brazilian integration roundtables in the research reports, the Port of Houston and Leigh Boske through the LBJ School of Public Affairs have launched a pilot project to identify key players and requirements for conducting commerce in the Houston-Varacruz (Mexico), Houston-Colon (Panama), and Houston-Santos (Brazil) trade corridors.

SWUTC Researcher Analyzes Texas' Speed Limit Laws and Fatality Accident Rates

SWUTC Project #167320/P.I. Ron Goodwin

Automobile safety continues to be a major concern in Texas and across the country. When the Federal government repealed the 55mph speed limit restrictions, spirited debates followed. Many believed higher speeds would result in more fatalities. Other believed the highways would actually be safer because the speed limits would then reflect the natural flow of traffic, thereby removing dangerous movements like weaving and tailgating. In Texas, vehicle miles traveled continue to increase, which means increased opportunities for fatalities.

Across the country there have been reports that the increased speed limits have not meant increased fatalities. Therefore, Dr. Goodwin and his research staff sought to determine if that premise held true for Texas. By comparing the Texas figures against the national numbers they were able to determine if the statewide trends were similar or dissimilar to those nationwide. However, the principal objective of this study was the determination of whether or not speeding related fatalities increased in Texas during the period 1996-1999.

The findings indicate that from 1996 to 1999, the increase in speed limits resulted in a greater number of fatal accidents on Texas roadways at speeds equal to and greater than 65 miles per hour. In Texas, there was an 87 percent increase in fatalities when the speed of the vehicles exceeds 65 mph, compared to a 70 percent increase nationwide for the same time period. The data indicating increased fatalities occur at higher speeds holds across several categories. When examining fatalities at speeds of 65 mph and greater by land uses there were increased fatalities in rural and urban locations (85 and 91 percent, respectively). There were also increases in fatalities involving multiple vehicles (91%) and single vehicles (83%). In relation to roadway location, there were increases in fatalities occurring on the roadway (16%) and off the roadway (32%) for 1994-1999.

Therefore, while fatalities at higher speeds increased in Texas and nationwide, the total traffic fatalities ratio (fatalities at all speeds/100m VMT) actually experienced a decline. In Texas the fatalities ratio had a decline of 7%. Nationally, the fatality ratio decreased 11%. Even with the VMT increases in Texas and nationwide, the decrease in fatalities at lower speeds was significant enough to lower the fatality ratio in both data sets.

Project Analyzes Effectiveness of Roadway Pricing Control Strategies

SWUTC Project #167220/P.I.: Chandra Bhat

The implementation of roadway pricing controls may lead to complex responses from individuals. Individuals may stop making one or more trips, they may change the destination for trips, they may change travel modes, they may change time-of-day, they may switch routes, or they may combine these response strategies. Thus, the redistribution of vehicular trips in space and time due to pricing strategies can only be examined by developing a comprehensive modeling framework to accommodate the possible complex responses of individuals. This project addresses the development and implementation of methodologies

that will facilitate the analysis of varying pricing strategies across different times of the day. Most current methodologies, on the other hand, are able to evaluate pricing strategies implemented only within broad time periods. In addition, an important focus of this research will be on analyzing real-time pricing strategies, as opposed to fixed pricing strategies implemented only during pre-defined times of the day.



Dr. Bhat (center) discusses research results with his students.

This research formulated and applied a unified mixed-logit framework for joint analysis of revealed and stated preference data. The estimation of the mixed logit formulation is achieved using simulation techniques to examine the data drawn from surveys conducted as part of the 1996 San Francisco Bay Area Travel Study, which documents the travel behavior responses of San Francisco Bay Bridge users to changes in travel conditions. The results of the mixed logit formulation are compared with those of more restrictive structures on the basis of parameter estimates, implied trade-offs

among level-of-service attributes, heterogeneity and state dependence effects, data fit, and substantive implications of congestion pricing policy simulations.

The principal conclusions drawn from this research are as follows:

1. Individuals are more likely to change departure times than change travel modes in response to changes in travel service characteristics.
2. Individuals in households with a high number of vehicles relative to number of workers are likely to choose the drive alone modes (DAP or DAO). Also, individuals who are male and employed tend to choose the drive alone mode during the peak period than other travel alternatives. High income earners are likely to choose the drive alone mode during the peak period compared to other travel alternatives.
3. An increase in toll by \$2.00 for individuals driving alone during the peak hour on Bay area bridges is estimated to lead to a decrease in the drive alone share during the peak period by 9%. The toll also increases the share of individuals driving alone during the off-peak periods by 13%.
4. There are substantial differences across individuals in overall preferences for modal alternatives. There is also significant variation in the time and cost sensitivity across individuals.
5. Joint revealed preference (RP) and stated preference (SP) methods are better able to represent trade-offs in level-of-service attributes, and also provide efficiency benefits in estimation by recognizing the presence of a common latent preference structure underlying the RP and SP responses.
6. The results highlight the need to include (or at least test for) flexible inter-alternative error structures, unobserved heterogeneity, state dependence, and heterogeneity in the state dependence effects within the context of a unified methodological framework to assist informed policy decision-making.

This project is intended to assist metropolitan planning organizations in Texas and other states who are currently in the process of improving travel demand forecasting procedures to respond to the new requirements placed by federal legislation. The models developed here should also be useful to the US Department of Transportation for implementation in their Travel Model Improvement Program (TMIP).

The results of this research were presented at the 2002 Transportation Research Board Meeting in Washington D.C. and have been published in *Transportation Research* ("A Unified Mixed Logit Framework for Modeling Revealed and Stated Preferences: Formulation and Application to Congestion Pricing Analysis in the San Francisco Bay Area", *Transportation Research*, Vol. 36B, No. 7, pp. 593-616, August 2002).

Vans Purchased for Colonias Community Centers Proven Effective

SWUTC Project #466630/P.I.: Dock Burke

In the United States, approximately 1,450 colonias along the Texas-Mexico border are home to 350,000 people. These rural settlements often do not have water, sewer and electricity. Residents frequently don't have ready access to education and medical care. They live isolated lives, largely due to the lack of transportation.

In 1994, the Texas A&M University Center for Housing and Urban Development (CHUD) began a project designed to improve the lives of impoverished people living in colonias along the Texas border. The objective of the Colonias Program was to promote "community self-development," a concept by which the residents became involved in activities to improve the social infrastructure of the community. At the core of the program was an unmet need to provide residents with transportation to the community centers set up in the colonias and to other towns.



Dock Burke at dedication ceremony for San Carlos vans.

The SWUTC joined with CHUD in 1997 and funded a project to look at transportation issues and possible solutions. After evaluating the needs of the colonias, SWUTC developed a demonstration project to supply a 15-passenger van for transportation service for a community center in El Cenizo, a Webb County colonia.

The success of the pilot program prompted the SWUTC and CHUD to approach the State Energy Conservation Office (SECO) to buy additional passenger vans for the established centers in the colonias. Through a multi-year \$1,048,520 SECO contract administered by the SWUTC, the initial pilot project has been replicated many times now, and the program has approved the purchase of 31 vans.

Bob Otto, program administrator with SECO, believes the program has been a big success. "A lot of these residents who don't have a vehicle now have the opportunity to become part of the community by being able to attend some of the community services at the resource centers," says Otto. "The resource centers are kind of a gathering place now for the people in that community."

Colonia residents who once lived isolated lives now have more choices. This program gives the residents an alternative, so they can come to the center and access a van that will take them into town to see a doctor, get a prescription filled or buy groceries. These transportation services help provide accessibility to many residents in colonias who would otherwise be isolated.

SWUTC Founding Member and Researcher Wins Award

Naomi Ledé, former SWUTC Executive Committee member, former CTTR director at Texas Southern University and current Senior Research Scientist at the Texas Transportation Institute was honored as the recipient of the inaugural *Sharon D. Banks Award for Innovative Leadership in Transportation* on January 16, 2002, at the Transportation Research Board's (TRB) 81st Annual Meeting.



Established by TRB with the support of the U.S. Department of Transportation, the *Sharon D. Banks Award for Innovative Leadership in Transportation* recognizes sustained leadership accomplishments and innovations over an extended period of time that exemplify Banks' caring nature and depth of character. The award criteria include a documented record of successful and innovative leadership by improving transportation services, operations, management practices, mentoring and training programs, community relations or labor relations.

Ledé assumed her position with TTI in 1998 after retiring from Texas Southern University with a 25-year distinguished career in transportation research and education. There she served as director of the Center for Transportation Training and Research (CTTR), developing one of the strongest and most well respected transportation research and education programs in any historically black university in the nation.

Additionally, she developed a National Summer Transportation Institute (NSTI) aimed at introducing junior high and high school students from the minority community to the many opportunities of a career in transportation. The program has been recognized with a number of national Federal Highway Administration (FHWA) awards. With others at TTI, Ledé is continuing to develop innovative programs for students from elementary school through college to increase the number and the quality of those entering transportation careers.

Technology Transfer

Timely 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) — for individual research projects — to potential and interested users and colleagues.

Selected Technology Transfer Highlights

Texas Southern University Hosts Transit Oriented Development Workshop

SWUTC Project #473700-00044/P.I. Carol Lewis/Khosro Godazi

There is a growing consensus about the need to be more proactive in decision-making leading to better coordination of transit and proximate land uses. According to a concept termed, transit-oriented development (TOD), neighborhoods are designed to encourage walking, are linked very well to transit for meeting needs outside of the neighborhood and provide a “sense of place”. The communities are designed to garner benefits from being near schools, shopping, restaurants and personal service providers (such as cleaners and barber/beauty care establishments). The benefits of these neighborhoods are many, but include the fact that fewer automobiles are needed for tripmaking. Although often associated with rail projects and rail station locations, the concept can work with buses as the nucleus of the transportation element.

On November 16-17, 2002, the SWUTC through the Center for Transportation Training and Research at Texas Southern University co-sponsored the TOD Workshop along with the Metropolitan Transit Authority of Harris County, The Houston Chapter of the Conference of Minority Transportation Officials, City of Houston Planning and Development and the Gulf Coast Institute. The workshop attracted national experts, transit officials, planners, and community residents to discuss issues pertinent to transit oriented development. More than 100 attendees gained insight into TOD requirements and potential opportunities for transit oriented development in Houston. The first morning featured a national perspective and a look at the local environment regarding the topic; afternoon break sessions provided additional detail on necessary components. Participants discussed strategies to overcome funding problems, addressed private sector requirements, and examined regulatory challenges that impede transit oriented development. The second day included two charettes, one bus and one rail, which resulted in specific recommendations for TOD around a METRO light rail station and bus transit center. The workshop achieved the stated goals as follows: 1) identified and described they key elements of successful transit oriented development; 2) applied the TOD elements to specific sites, using Houston as an example; and 3) provided a summary of the implementation steps in the TOD process.



Participants at TOD Workshop

Since the workshop the Urban Land Institute sponsored a seminar, which built on the two-day session. Recommendations were made to the City of Houston about modifications in guidelines that the City can make to facilitate the type of community oriented planning that enables TOD to be successful. Also meetings have occurred between developers, METRO and the City of Houston to advance one of the concepts designed at the Saturday charette.

SWUTC Hosts Third Annual Texas Rural Transportation Conference

SWUTC Project#167120/P.I. Dock Burke

Providing a viable transportation system has long been recognized as a critical component to ensuring the economic health and vitality of rural areas in Texas. Maintaining adequate freeways, roadways, bridges, waterways, public transit systems, intercity bus services, freight and passenger rail systems, and airports and air services is critical to ensuring individual mobility and transporting agricultural and other commodities. In addition the transportation system is critical to the tourism industry, which is an important component of the rural economy in Texas.

To address these significant transportation issues, TTI and the SWUTC have co-hosted three Rural Transportation Conferences, sponsored with Kellogg Foundation funding to Dr. Duane Rosa, head of TTI's Regional Division at West Texas A&M in Canyon, Texas. The third Texas Rural Transportation Conference was held at Texas A&M International University in Laredo, Texas at the *Center for the Study of Western Hemispheric Trade* on March 8, 2002. The theme of the conference focused upon transportation services and employment, transportation issues in colonias neighborhoods, and rural transportation providers in the border region. TAMIU President Dr. Ray Keck and Dr. Herb Richardson, Chairman of the SWUTC Executive Committee, welcomed 94 conferees to the day long conference, which featured an opening presentation by Ms. Diane D. Rath, Chair of the Texas Workforce Commission. Chair Rath emphasized the importance of transportation in supporting the employment of the state's labor force. Finding efficient means to get the prospective workers to their jobs is a continuing challenge to the transportation systems in rural Texas.

Next, Ms. Margot Massey, director of the Texas Department of Transportation (TxDOT) public transportation division, presented the opportunities and challenges in providing rural public transportation in the state and led a panel of practitioners from three rural public transportation systems. The transit professionals, from West Texas, the Coastal Bend, and Southwest Texas, described some solutions and state-of-the-art approaches to overcoming the problems inherent in moving relatively small numbers of people over long distances in rural Texas. For example, some workers travel almost 100 miles each way to jobs. Mr. Fred Mustain, Transportation Director, West Texas Opportunities; Ms. Gayle Knight, Regional Transit Coordinator, Coastal Bend Regional Transportation Committee; and Ms. Sarah Hidalgo-Cook, Transit Manager, Community Council of Southwest Texas, each presented case study examples of problematic situations and solutions used in their rural public transportation agency operations.

In the afternoon's session, State Representatives Ignacio Salinas and Richard Raymond each described priorities for rural transportation, particularly in the border region of Texas. Audience members responded with numerous questions directed at the outlook for transportation and related issues in the next legislative session. Mr. Oscar Muñoz and Dr. Marlynn May of Texas A&M University outlined some of the unique challenges facing the residents in the Texas border colonias neighborhoods from Brownsville to El Paso.

TxDOT's Laredo District Engineer Luis Ramirez, closed the Texas Rural Transportation Conference program with a presentation describing how the new \$175 million bond financed road building program will be used to plan, identify, select, and build road projects to improve transportation accessibility for colonias residents in the state's border counties.

SWUTC Project Generates Interactive Website

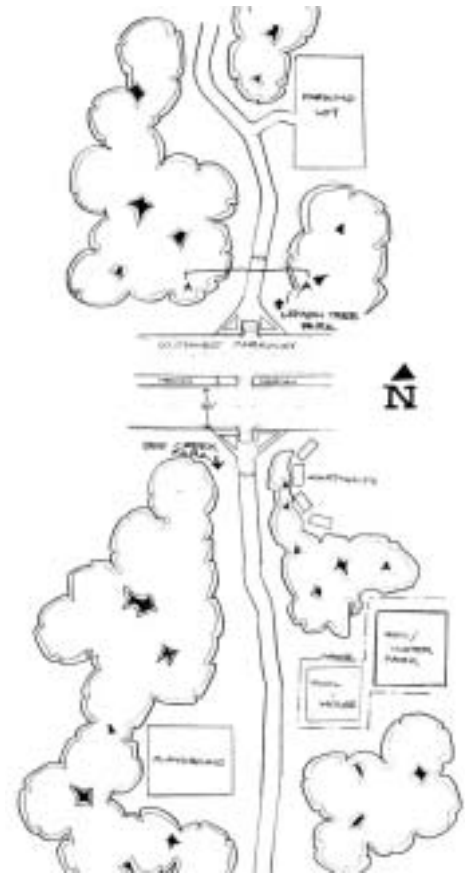
SWUTC Project #167425 /P.I. Jody Naderi

There are environmentally and spatially significant factors affecting pedestrian health and safety which contribute to an enhanced quality of life. Additionally, the FHWA has identified the need for research pertaining to user characteristics of the pedestrian. Dr. Naderi, through her SWUTC research project examined the safety and health issues associated with pedestrian movements including people walking for health (both physical and spiritual), leisure and commuting.

Initially, Dr. Naderi identified environmental variables that define the physical parameters of the pedestrian realm. Then sites which contained spatial sequences that were supportive of making a decision to walk for health, commuting and/or spiritual renewal were identified. Subsequently, these different walking environments were documented with videotape, stills and drawings so that their various physical configurations could be compared and evaluated. Ultimately, a website was produced that is designed to collect data on various pedestrian environments. (<http://archnt2.tamu.edu/jnaderi/>)

The website contains a video archive of pedestrian spatial sequences. Each sequence has a ten second video clip, and plan/section drawings of the environment. Following the video clip, an online questionnaire is available for response. The results of the on-line surveys associated with the various pedestrian environments will give researchers, landscape architects, engineers, and health practitioners a better understanding of the environmental variables that affect the nature of walking.

Already, the results of this research has been incorporated into the curriculum of Health Facility Design and Landscape, and the Urban Design studios within the College of Architecture at Texas A&M University. Through her numerous presentations at national and international conferences disseminating the research results, Dr. Naderi has received very positive feedback on her SWUTC work. "We have been very encouraged to find that the public health and medical communities are very interested in funding research which encourages physical activity," says Dr. Naderi. She has also established contacts throughout the CDC, Robert Woods Johnson, the National Institute of Health and various medical campuses around Texas to identify additional future research opportunities.



Pedestrian Walkway Site Plan

New Projects

Number: 473700-00011

Title: *Current and Future Rail Access Corridor Needs of Southern Texas Ports*

P.I.: David Bierling, TAMU

Number: 473700-00044

Title: *State of the Industry Overview-A Transit-Oriented Development Conference* (2nd year continuation of 473700-00044 funded in FY01)

P.I.: Carol Lewis/Khosro Godazi, TSU

Number: 473700-00045

Title: *Evaluation and Combined Use of TRANSYT-7F and CORIM in Traffic Signal Optimization and Simulation*

P.I.: Lei Yu, TSU

Number: 473700-00065

Title: *Emerging Models for Provision of Real-Time Traveler Information Services: Transportation System Management Implications* (2nd year continuation of 473700-00065 funded in FY01)

P.I.: Hani Mahmassani, UT-Austin

Number: 473700-00067

Title: *Monitoring U.S. Safety Rules for Mexican Trucks*

P.I.: Rob Harrison, UT-Austin

Number: 167421

Title: *Dissemination of Data and Training in the Analysis of Critical Transportation Planning Information for Small Texas Cities and Counties*

P.I.: David Ellis, TAMU

Number: 167422

Title: *Public Transit and Livable Communities: Corpus Christi After Evaluation*

P.I.: Laura Higgins, TAMU

Number: 167423

Title: *Develop a Transportation Road Show and Library of Promotional and Marketing Materials to Encourage Development of a Transportation Workforce*

P.I.: Debbie Jasek, TAMU

Number: 167424

Title: *Providing Personalized Traffic Safety Information to the Public Using Web-Based Geographical Information System (Web-GIS) Technologies*

P.I.: Shaw-Pin Miaou, TAMU

Number: 167425

Title: *Pedestrian Health and Safety: Case Studies and Simulation*

P.I.: Jody Naderi, TAMU

Number: 167426

Title: *Development of an Integrated Assessment of Transportation Data for the Texas-Mexico Border Region*

P.I.: Cesar Quiroga, TAMU

Number: 167427

Title: *Simulation Modeling of Passenger Car and Truck Interaction*

P.I.: Larry Rilett, TAMU

Number: 167520

Title: *Air Travel: A Systematic Analysis of Traveler Choices*

P.I.: Chandra Bhat, UT-Austin

Number: 167521

Title: *Making Transportation Corridors Work: The Potential for Integration Roundtables at Southwest Seaports*

P.I.: Leigh Boske, UT-Austin

Number: 167522

Title: *The Case of the Soccer Mom and Other Stories: Travel by Choice or Necessity?*

P.I.: Susan Handy, UT-Austin

Number: 167523

Title: *Uncertainty in Integrated Land-Use Transport Models: Simulation and Propagation* (Continuation of 167223 funded in FY01)

P.I.: Kara Kockelman, UT-Austin

Number: 167524

Title: *Adaptive Traffic Signal Control Development and Evaluation* (Continuation of 167224 funded in FY 01 & 167805 funded in FY00)

P.I.: Randy Machemehl, UT-Austin

Number: 167525

Title: *Optimizing Transit Network Patterns*

P.I.: Randy Machemehl, UT-Austin

Number: 167526

Title: *Real-Time Integrated Management of Intermodal Fleet Operations* (Continuation of 167228 funded in FY01 & 167807 funded in FY00)

P.I.: Hani Mahmassani, UT-Austin

Number: 167527

Title: *Shipper and Carrier Participation in Electronic Marketplaces and Implications for Freight Logistics*

P.I.: Hani Mahmassani, UT-Austin

Number: 167528

Title: *Disaster and Major Emergency Management Using Dynamic Modeling Approaches and ITS Technologies*

P.I.: Hani Mahmassani, UT-Austin

Number: 167529

Title: *Regional Impacts on Congestion Pricing*

P.I.: C. M. Walton, UT-Austin

Number: 167530

Title: *Evaluating the Performance of Arrival Passenger Processing Facilities for Increasing Aircraft Size* (Continuation of 167230 funded in FY01)

P.I.: C. M. Walton, UT-Austin

Number: 167531
 Title: *The Use of ITS Technologies to Improve Transport Efficiency for an Aging Population*
 P.I.: C. M. Walton, UT-Austin

Number: 167533
 Title: *Develop a Dynamic System to Simulate the Life-Cycle Performance of Pavements* (Continuation of 167232 funded in FY01 & 167803 funded in FY00)
 P.I.: Zhanmin Zhang, UT-Austin

Number: 167620
 Title: *A Longitudinal Assessment of the Relationship Between Land Use, Land Values, and Bus Facilities*
 P.I.: Carol Lewis, TSU

Number: 167621
 Title: *An Evaluation of 3-D Traffic Simulation Modeling Capabilities*
 P.I.: Sharon Boxill, TSU

Number: 167622
 Title: *Analysis of Federal and State Discretionary Funding of Highway and Transit Projects*
 P.I.: Ron Goodwin, TSU

Number: 167122
 Title: *Vanpools as Alternative to Fixed-Route Service*
 P.I.: Laura Higgins, TAMU

Number: 167123
 Title: *Develop a Transportation Science Competition and Career Fair for Junior High and High School Students*
 P.I.: Debbie Jasek/Beverly Kuhn, TAMU

Number: 167125
 Title: *Development of Integrated Rollover Warning and Active Control Systems (RWCS) for Tractor-Semitrailers*
 P.I.: Reza Langari/James Ochoa, TAMU

Number: 167127
 Title: *Commercial Transportation Safety and Operations Workshop*
 P.I.: James Ochoa/Dan Middleton, TAMU

Number: 167128
 Title: *Sustainable Transportation Performance Measures for Developing Communities*
 P.I.: Josias Zietsman, TAMU

Number: 167220
 Title: *A Methodology to Analyze the Effectiveness of Roadway Pricing Control Strategies Using Travel Survey Data*
 P.I.: Chandra Bhat, UT-Austin

Ongoing Projects

Number: 473700-00007
 Title: *Evaluate Strategies for Using the Transportation Management Infrastructure in the Role of National Defense Preparedness*
 P.I.: Russell Henk, TAMU

Number: 473700-00009
 Title: *Assess the Potential of Transportation Management Centers in Improving Hurricane Evacuation Operations*
 P.I.: Russell Henk, TAMU

Number: 473700-00043
 Title: *The Integration of GIS and Transportation Modeling: A State-of-the-Practice Review*
 P.I.: Sharon Adams, TSU

Number: 473700-00063
 Title: *Evaluating Operating Strategies and Transportation Control Measures which Reduce Air Pollution at Airports*
 P.I.: C. M. Walton, UT-A

Number: 473700-00065
 Title: *Emerging Models for Provision of Real-Time Traveler Information Services: Transportation System Management Implications*
 P.I.: Hani Mahmassani, UT-Austin

Number: 167121
 Title: *Evaluation of the Economic Growth, Air Quality and Noise Impacts of Regional Jet Service at Commercial Airports Serving Small Cities*
 P.I.: Jeff Borowiec, TAMU

Number: 167224
 Title: *Adaptive Traffic Signal Control Development and Evaluation* (Continuation of 167805 funded FY00)
 P.I.: Randy Machemehl, UT-Austin

Number: 167225
 Title: *Characterizing Transit Passenger Access Decisions* (Continuation of 167806 funded FY00)
 P.I.: Randy Machemehl, UT-Austin

Number: 167228
 Title: *Integrating Real-Time Information with Dynamic Fleet Decision Systems for Intermodal Freight Mobility* (Continuation of 167807 funded FY00)
 P.I.: Hani Mahmassani, UT-Austin

Number: 167229
 Title: *Design and Implementation of an Intelligent Parking System for a Major Activity Center* (Continuation of 167811 funded FY00)
 P.I.: C. Michael Walton, UT-Austin

Number: 167230
 Title: *Impact of New Large Aircraft on Arrival Passenger Flows at Airport Terminals*
 P.I.: C. Michael Walton, UT-Austin

Number: 167231
 Title: *Restricting the Use of Reverse Thrust as an Emissions Reduction Strategy for Airports*
 P.I.: C. Michael Walton

Number: 167232
Title: *Develop a Dynamic System to Simulate the Life-Cycle Performance of Pavements*
P.I.: Zhanmin Zhang, UT-Austin

Number: 167320
Title: *Analysis of Texas' Speed Limit Laws and Fatality Accident Rates*
P.I.: Ron Goodwin/Sharon Boxill, TSU

Number: 167321
Title: *An Evaluation of Alternative Fuels Usage by Public Transit Agencies*
P.I.: Ron Goodwin, TSU

Number: 167322
Title: *An Assessment of Examination Criteria Used for Transit Friendly Decision-Making*
P.I.: Carol Lewis, TSU

Number: 167703
Title: *Developing a Sketch-Planning Technique Relating Economic Activity and Urban Mobility in Small and Medium-Sized Urban Areas*
P.I.: David Schrank, TAMU

Number: 167705
Title: *An Assessment of U.S.-Mexico Trade Corridors and Border Infrastructure Development*
P.I.: Felipe Zambrano, TAMU

Number: 167709
Title: *Carbon Dioxide Emission Reductions Through the Use of Fly Ash in Concrete Production*
P.I.: Cindy Estakhri/John Overman, TAMU

Number: 167803
Title: *Develop a Dynamic System to Simulate the Life-Cycle Performance of Pavements*
P.I.: Zhanmin Zhang/Ron Hudson, UT-A

Number: 167805
Title: *Adaptive Traffic Signal Control Development and Evaluation*
P.I.: Randy Machemehl, UT-A

Number: 167806
Title: *Characterizing Bus Transit Passenger Boarding and Deboarding Processes*
P.I.: Randy Machemehl, UT-A

Number: 167807
Title: *Integrating Real-Time Information with Dynamic Fleet Decision Systems for Intermodal Freight Mobility*
P.I.: Hani Mahmassani, UT-A

Number: 167809
Title: *From Information to Knowledge: Strategies and Techniques for Mining Real-Time Traffic Data Bases*
P.I.: Hani Mahmassani, UT-A

Number: 167811
Title: *Intelligent Parking Systems*
P.I.: C. M. Walton, UT-A

Number: 167900
Title: *A Comparative Assessment of Emerging Transportation Techniques: A Seminar for Professional and Student Exchange*
P.I.: Khosro Godazi, TSU

Number: 167903
Title: *Evaluation of the Potential to Link Rural Communities with their Urban Neighbors*
P.I.: Ron Goodwin, TSU

Number: 466610
Title: *Public Transportation for the Colonias*
P.I.: Dock Burke, TAMU

Completed Projects

Number: 473700-00005
Title: *Examining Information Needs for Efficient Motor Carrier Transportation Logistics*
P.I.: Bill Eisele/Larry Rilett, TAMU

Number: 473700-00042
Title: *An Examination of the Smart Growth Initiative and Its Application to Region VI Communities*
P.I.: Carol Lewis, TSU

Number: 473700-00044
Title: *State of the Industry Overview - A Transit-Oriented Development Conference*
P.I.: Carol Lewis/Khosro Godazi, TSU

Number: 473700-00062
Title: *Inland Ports and their Contribution to Transportation Efficiencies*
P.I.: Rob Harrison, UT-A

Number: 473700-00064
Title: *Real-Time Traveler Information Systems for Non-Commuting Trips*
P.I.: Hani Mahmassani, UT-A

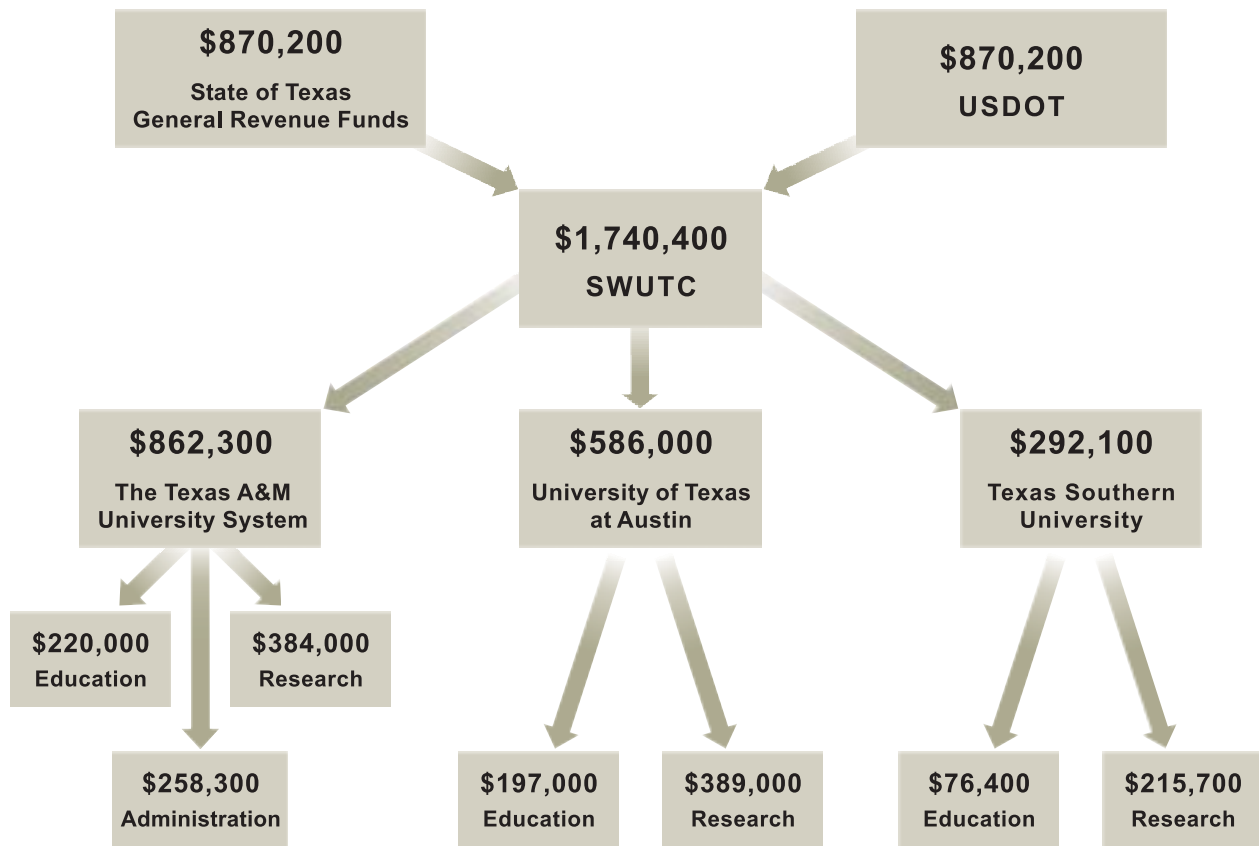
Number: 473700-00066
Title: *Using the Gulf Intracoastal Waterway (GIWW) to Move Containers to Gulf Ports*
P.I.: Rob Harrison, UT-Austin

Number: 167124
Title: *Adaptive Equipment to Enhance Older Driver Performance*
P.I.: Rodger Koppa, TAMU

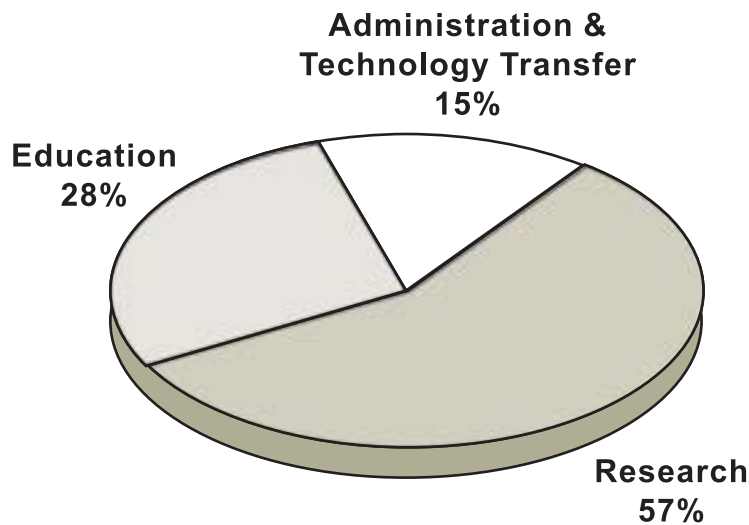
Number: 167126
Title: *Identification and Evaluation of In-Vehicle Distractors on Driving Performance*
P.I.: Michael Manser, TAMU

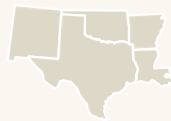
- Number: 167130
 Title: *A Proposal to Conduct an Institute to Prepare High School Students for Transportation Careers in Texas*
 P.I.: Naomi Ledé, TAMU
- Number: 167222
 Title: *The Education of Transportation Professionals* P.I.: Susan Handy, UT-Austin
- Number: 167223
 Title: *Uncertainty in Integrated Land Use-Transport Models*
 P.I.: Kara Kockelman, UT-Austin
- Number: 167701
 Title: *An Internet Clearinghouse of Marine and Intermodal Information for Sustainable Transportation and Economic Development*
 P.I.: John Basilotto, TAMU
- Number: 167702
 Title: *An Analysis of the Market Potential for Distance Learning Opportunities in Transportation Professional Development*
 P.I.: Beverly Kuhn, TAMU
- Number: 167704
 Title: *Transportation and Tourism Workshop*
 P.I.: Katie Turnbull, TAMU
- Number: 167706
 Title: *The Contribution of Hand-Held Cellular Phones to Vehicular Accidents*
 P.I.: Jason Crawford, TAMU
- Number: 167707
 Title: *Comprehensive Engineering Approach to Achieving Safe Neighborhoods*
 P.I.: James Bonneson, TAMU
- Number: 167708
 Title: *Automated Identification of Flow Patterns in Congested Traffic*
 P.I.: Paul Nelson, TAMU
- Number: 167711
 Title: *Agenda Setting in the Transportation Policy Domain*
 P.I.: Eric Lindquist, TAMU
- Number: 167800
 Title: *A Joint Model System of Mode Choice, Destination Choice, and Departure Time Choice for Nonwork Trips*
 P.I.: Chandra Bhat, UT-A
- Number: 167801& 167221
 Title: *Impact of Latin American Trade on the Southwest Region's Economic Growth Prospects and Transportation System*
 P.I.: Leigh Boske, UT-A
- Number: 167802
 Title: *Understanding the Growth in Nonwork VMT*
 P.I.: Susan Handy, UT-A
- Number: 167804
 Title: *The Propagation of Uncertainty in Multi-Stage Transport Demand Models*
 P.I.: Kara Kockelman, UT-A
- Number: 167808 & 167227
 Title: *Freight Transportation and Logistics Implications of Electronic Commerce and Virtual Supply Chains*
 P.I.: Hani Mahmassani, UT-A
- Number: 167810
 Title: *The Implications of Data Usage and Privacy on ITS Organizations*
 P.I.: C. M. Walton, UT-A
- Number: 167901
 Title: *Travel Demand Forecasting Models: A Comparison of EMME2/QRS*
 P.I.: Lei Yu, TSU
- Number: 167902
 Title: *An Assessment of the Procedures for Integrating Taxicabs into an Urban Environment*
 P.I.: Ron Goodwin/Carol Lewis, TSU

Funding Sources & Expenditures



Distribution of Funds





**Southwest Region University Transportation Center
The Texas A&M University System**

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