Program Progress Performance Report

Submitted to:	U.S. Department of Transportation Research and Innovative Technology Administration (RITA)
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Project Title:	Southwest Region University Transportation Center
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Grant Period:	January 1, 2012 – January 31, 2016
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Report Term:	Semi-annual – January 1, 2013 – June 30, 2013

Dock Burke - Director

1. Accomplishments:

SWUTC Goals as stated in SWUTC *Prospectus* – to produce research, education and workforce development and technology transfer initiatives that serve the needs of Region 6 and support the five strategic goals of USDOT.

SWUTC Goal #1: Research Program

With this grant, SWUTC's research program will build on historical accomplishments, and make fundamental strides in basic and advanced research that will be implementable by operating agencies responsible for improving accessibility and mobility while reducing congestion in our urban transportation systems; provide infrastructure renewal; harmonize freight movements between Canada, U.S. and Mexico; reduce the bottlenecks while improving the technology and linkages among the freight and passenger modes in the intermodal transportation network; improve the livability of our rural and urban neighborhoods; and contribute to improvements in the overall safety of the transportation enterprise in our region and nation.

2012 Funding Cycle Summary:

Proposals Finalized and Projects Activated – 100% complete:

Some research efforts deferred their initiation date to better coincide with the standard university fiscal year or graduate student availability. Additionally, some delays were encountered in processing subcontracts to consortium members.

FY12 Research Projects Selected

Initiation Date	Project Number	Study Title	Consortium Member	Current Status
1/1/12	0-5836	Performance of Permeable Friction Course (PFC) Pavements Over Time (continuation)	TAMU	In Progress
1/1/12	0-6607	Search for a Test for Fracture Potential of Asphalt Mixes	TAMU	In Progress
1/1/12	0-6613	Evaluate Binder and Mixture Aging for Warm Mix Asphalts	TAMU	In Progress
1/1/12	0-6629	Texas-Specific Drive Cycles and Idle Emissions Rates for Using with EPA's MOVES Model	TAMU	In Progress
4/1/12	161202	Urban Mobility Report	TAMU	Completed
4/1/12	600451-00006	A Comprehensive Characterization of Asphalt Mixtures in Compression	TAMU	In Progress
4/1/12	600451-00007	A Comprehensive VMT Fee Equity Impact Analysis	TAMU	In Progress
4/1/12	600451-00008	Decision Theory Models for Selecting Traffic Control Devices	TAMU	In Progress
4/1/12	600451-00009	Sustainability of Transportation Structures Using Composite Materials to Support Growth and Trade	TAMU	In Progress
4/1/12	600451-00010	Enhanced Adaptive Signal Control using Dedicated Short Range Communications	TAMU	In Progress

4/1/12	600451-00011	Evaluation of the Effectiveness of Voice-to-Text Programs at Reducing Incidences of Distracted Driving	TAMU	Completed
4/1/12	600451-00012	Fatigue Modeling of Hot Mix Asphalt Using Field Samples to Ensure a State of Good Repair	TAMU	In Progress
4/1/12	600451-00013	Improvements to the Urban Mobility Report Methodology	TAMU	Completed
4/1/12	600451-00014	Novel Transit Signal Priority under the Connected Vehicle Framework	TAMU	In Progress
4/1/12	600451-00015	U in the Driver Seat	TAMU	In Progress
4/1/12	600451-00016	Decision-Support Framework for Quantifying the Most Economical Incentive/Disincentive Dollar Amounts for Critical Highway Pavement Rehabilitation Projects	TAMU	In Progress
4/1/12	600451-00017	Travel Surveys: Moving from Tradition to Innovation	TAMU	In Progress
5/1/12	600451-00062	Workability of Asphalt Binders at Mixing Temperatures for Hot and Warm Mix Asphalt	UT-Austin	In Progress
5/1/12	600451-00063	The Transportation-Related Causes and Consequences of Land Use Change	UT-Austin	In Progress
5/1/12	600451-00064	Local Infrastructure to Support the Widespread Use of Hybrid/All Electric Vehicles: What Programs and Public Policies are Likely to Work to Promote Environmental Sustainability and Livable Communities	UT-Austin	In Progress
5/1/12	600451-00065	Game Theory and Traffic Assignment: Refinements, Stability, and Tractability	UT-Austin	In Progress
5/1/12	600451-00066	Multistate Megaregion Freight Planning Benefits: Evidence from Louisiana-Texas	UT-Austin	In Progress
5/1/12	600451-00067	Life-cycle Costs and Benefits of Different Land Use and Transportation Patterns	UT-Austin	In Progress
5/1/12	600451-00068	Real Time Optimization of Passenger Collection for Commuter Rail Systems	UT-Austin	In Progress
5/1/12	600451-00069	Development of an Interactive GIS Based Work Zone Traffic Control Design Tool	UT-Austin	In Progress
5/1/12	600451-00070	Developing a Research Agenda to Increase Cycling in the African American Community: A Case Study of Austin, TX	UT-Austin	In Progress
5/1/12	600451-00071	Quantification of Infrastructure Consumption under Different Axle Configurations and Wheel Loads	UT-Austin	In Progress
5/1/12	600451-00072	Private vs. Public Financing of Transportation Systems	UT-Austin	In Progress
5/1/12	600451-00073	Transportation Funding for a Changing Light-Duty Vehicle Fleet: Pricing Model and Evaluation of Impacts on Society	UT-Austin	In Progress
5/1/12	600451-00074	Future Mobility Demand in Megaregions: A National Study with a Focus on the Gulf Coast	UT-Austin	In Progress

5/1/12	600451-00075	Develop a System to Support Preparation of Life-Cycle Budget Needs for Highways (Continuation of SWUTC Project 161128)	UT-Austin	In Progress
7/1/12	161242	Evaluating Safety Performance and Developing Guidelines for the Use of Right Turn on Red (RTOR)	TSU	Completed
8/1/12	600451-00041	The Impact of the Conversion of Incandescent Bulbs to LED Bulbs for Traffic Lights in Houston: A Step Toward Sustainable Control Devices	TSU	In Progress
7/1/12	600451-00042	Sustainable Transportation for Texas Southern University	TSU	In Progress
8/1/12	600451-00043	Developing a Methodology for Projecting Intercity Commuting	TSU	In Progress
8/1/12	600451-00044	Left-Turn Lanes at Unsignalized Median Openings	TSU	In Progress
12/1/12	600451-00101	Mega-Region Traffic Modeling Project	CETR/LSU	In Progress
12/1/12	600451-00102	Calibration of the Louisiana Highway Safety Manual	CETR/LSU	In Progress
12/1/12	600451-00103	Effects of Changing Driving Conditions on Driver Behavior Towards Design of a Safe and Efficient Traffic System	CETR/LSU	In Progress
12/1/12	600451-00105	Use of Containers to Carry Bulk and Breakbulk Commodities and Its Impact on Gulf Region Ports and International Trade	CETR/UNO	In Progress
12/1/12	600451-00106	Cooperation and Competition - Regional Transportation Planning and Competitive Federal Awards	CETR/UNO	In Progress
12/1/12	600451-00107	States' Tools for Connecting Transportation and Affordable Housing	CETR/UNO	In Progress
12/1/12	600451-00108	The Confluence of Transportation and Economic Activity in a Mega Region Disaster	CETR/UNO	In Progress
12/1/12	600451-00109	Accessing the Mega-Region: Evaluating the Role of Livable Community Patterns in Gulf Coast Mega-Region Planning	CETR/UNO	In Progress

2013 Funding Cycle Summary:

Review Problem Statements and Select Projects for Funding:

100% of TAMU research funds allocated. Total number of projects: 30
100% of UT-Austin research funds allocated. Total number of projects: 14
100% of TSU research funds allocated. Total number of projects: 6
50% of CETR research funds allocated. Total number of projects: 4

FY13 Research Projects Selected

Initiation Date	Project Number	Study Title	Consortium Member	Current Status
9/1/12	0-6613	Evaluate Binder and Mixture Aging for Warm Mix Asphalts	TAMU	In Progress
9/1/12	0-6614	Use of Recycled Asphalt Shingles in HMA	TAMU	In Progress
9/1/12	0-6629	Texas-Specific Drive Cycles and Idle Emissions Rates for Using with EPA's MOVES Model	TAMU	In Progress
9/1/12	0-6638	Preparing for EPA Effluent Limitation Guidelines	TAMU	In Progress
9/1/12	0-6658	Collection of Materials and Performance Data for Texas Flexible Pavement and Overlays	TAMU	In Progress
9/1/12	0-6672	Intelligent Transportation System (ITS) Strategic Plan	TAMU	In Progress
9/1/12	0-6674	Improving Fracture Resistance in Asphalt Binder with Verification on Asphalt Mixture Cracking Performance	TAMU	In Progress
9/1/12	0-6676	Rapid Field Detection of Moisture for Base and Subgrade	TAMU	In Progress
9/1/12	0-6683	Develop a Pavement Project Evaluation Index to Support the 4-Year Pavement Management Plan	TAMU	In Progress
9/1/12	0-6688	Evaluation of the I-10 Katy Freeway Managed Lanes	TAMU	In Progress
9/1/12	0-6702	Development of Pedestrian Crash Countermeasures & CRF	TAMU	In Progress
9/1/12	0-6714	Surface Treatments to Alleviate Crashes on Horizontal Curves	TAMU	In Progress
9/1/12	0-6722	Spread Prestressed Concrete Slab Beams	TAMU	In Progress
9/1/12	0-6737	Methods to Maximize Toll Revenues	TAMU	In Progress
9/1/12	0-6736	Performance Studies and Future Directions for Mixes Containing RAP and RAS	TAMU	In Progress
9/1/12	0-6744	New HMA Shear Resistance & Rutting Test for Texas Mixes	TAMU	In Progress
9/1/12	0-6747	Seal Coat Quality: Does Low Cost Mean Low Quality?	TAMU	In Progress
9/1/12	0-6758	Maintaining Project Consistency with an Emphasis on Maintaining Air Quality Conformity	TAMU	In Progress
9/1/12	0-6762	Maximizing Mitigation Benefits - Making a Difference with Strategic Inter-Resource Agency Planning	TAMU	In Progress
9/1/12	0-6769	Wrong Way Driving Countermeasures	TAMU	In Progress
11/1/12	161302	Urban Mobility Report (continuation)	TAMU	In Progress
11/1/12	161303	Next Generation Safety Performance Monitoring at Signalized Intersections Using Connected Vehicle Technology	TAMU	In Progress
11/1/12	161304	How do Travelers Perceive and Value Travel Time Reliability	TAMU	In Progress

11/1/12	161305	Strategic Transportation Finance Clearinghouse	TAMU	In Progress
11/1/12	161306	Developing the Hydraulics, Sedimentation and Erosion Control Laboratory to Become a Hands-on Training and Education Center	TAMU	In Progress
12/1/12	161341	Hot Spot Analysis of Teen Drivers in Houston Texas	TSU	In Progress
12/1/12	161342	Use of Directional Median Openings on Urban Roadways	TSU	In Progress
1/1/13	600451-00076	Micro Crack Growth in Recycled Asphalt Mixtures	UT-Austin	In Progress
1/1/13	600451-00077	A Novel Approach to Modeling and Predicting Crash Frequency at Urban Intersections by Crash Type and Injury Severity Level	UT-Austin	In Progress
1/1/13	600451-00078	Examining the Market Potential for Natural-Gas-Powered Trucks: Barriers and Opportunities for Promoting Environmental Sustainability and Economic Prosperity	UT-Austin	In Progress
1/1/13	600451-00079	Game-theoretic Analysis of Dynamic Traffic Equilibria	UT-Austin	In Progress
1/1/13	600451-00080	Impact of the Gulf Intracoastal Waterway (GIWW) on Freight Flows in the Texas-Louisiana Megaregion	UT-Austin	In Progress
1/1/13	600451-00081	Anticipating Long-Term Energy and GHG Emissions Impacts of Autonomous Vehicles	UT-Austin	In Progress
1/1/13	900451-00082	Real Time Optimization of Passenger Collection for Commuter Rail Systems (continuation of FY12 study)	UT-Austin	In Progress
1/1/13	600451-00083	Improving the Reliability of Automated Freeway Incident Detection Using Multiple Real Time Data Sources	UT-Austin	In Progress
1/1/13	600451-00084	Changing Perceptions of Cycling in the African American Community to Encourage Participation in a Sport that Promotes Health in Adults	UT-Austin	In Progress
1/1/13	600451-00085	Effect of Aggregate Micro- and Macro-texture on Pavement Skid Resistance	UT-Austin	In Progress
1/1/13	600451-00086	Financial Arrangements for Alternative Delivery Techniques for Transportation Programs and Projects	UT-Austin	In Progress
1/1/13	600451-00087	Policy Implications of Emerging Vehicle and Infrastructure Technology	UT-Austin	In Progress
1/1/13	600451-00088	Identifying the Local and Regional Travel Effects of Activity Centers in the Austin, Texas Area	UT-Austin	In Progress
1/1/13	600451-00089	An Integrated Approach to Managing the Transportation System	UT-Austin	In Progress
2/1/13	600451-00025	Controlling Electrical Conductivity of Asphalt Concrete for Multifunctional Applications	TAMU	In Progress
2/1/13	600451-00026	Zone/fleet Sizing for MAST (Mobility Allowance Shuttle Transit) Services	TAMU	In Progress

2/1/13	600451-00027	Forecasting the Impacts of Shale Gas Developments on Public Health and Transportation Systems on Both Sides of the Mexico-USA Border	TAMU	In Progress
2/1/13	600451-00028	Sustainability of Bridge Foundations Using Electrical Resistivity and Induced Polarization to Support Transportation Safety	TAMU	In Progress
2/1/13	600451-00029	Policy Implications of Automated Vehicles on Texas Highways	TAMU	In Progress
7/1/13	600451-00111	Use of Infrared Thermography to Control the Quality of Joints Construction and to Detect Reflective Cracking in Asphalt Pavements	CETR/LSU	In Progress
7/1/13	600451-00112	Assessment of Vehicle Performance in Harsh Environments Using Driving Simulator and Numerical Simulations	CETR/LSU	In Progress
7/1/13	600451-00113	Manual Traffic Control for Planned Special Events and Emergencies	CETR/LSU	In Progress
7/1/13	600451-00114	Analysis of Evacuation Clearance Time Under Megaregion Disaster Threats	CETR/LSU	In Progress
7/1/13	600451-00045	Safety Performance of Different Types of Freeway Weaving Segments	TSU	In Progress
7/1/13	600451-00046	A Case Study of Severe Environmental Justice Communities in the Houston Region	TSU	In Progress
7/1/13	600451-00047	The Effect of the City of Houston Transit Corridor Ordinance on Development along METRO's Light Rail Corridors	TSU	In Progress
7/1/13	600451-00048	Transportation Designs and Concepts to Make Houston METRO's Southeast Line at Palms Area More Livable	TSU	In Progress

Completed Research Project Accomplishments/Dissemination of Results:

◆ SWUTC Project #600451-00011: An Evaluation of the Effectiveness of Voice –to-Text Programs at Reducing Incidences of Distracted Driving

The study is the first of its kind, as it is based on the performance of 43 research participants driving an actual vehicle on a closed course. Other research efforts have evaluated manual versus voice-activated tasks using devices installed in a vehicle, but the SWUTC analysis is the first to compare voice-to-text and manual texting on a handheld device in an actual driving environment.

Major findings included:

- Driver response times were significantly delayed no matter which texting method was used. In each case, drivers took about twice as long to react as they did when they weren't texting. With slower reaction times, drivers are less able to take action in response to sudden roadway hazards, such as a swerving vehicle or a pedestrian in the street.
- The amount of time that drivers spent looking at the roadway ahead was significantly less when they were texting, no matter which texting method was used.
- For most tasks, manual texting required slightly less time than the voice-to-text method, but driver performance was roughly the same with both.
- Drivers felt less safe when they were texting, but felt safer when using a voice-to-text application than when texting manually, even though driving performance suffered equally with both methods.

Research results disseminated through:

- Published paper: Yager, C.E. (2013). Driver Safety Impacts of Voice-to-Text Mobile Applications. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, September 2013.
- Final technical report: *An Evaluation of the Effectiveness of Voice-to-Text Programs at Reducing Incidences of Distracted Driving*, Christine Yager, April 2013.
- Video summary of research results: Available at http://vimeo.com/64641918
- Press release generated 04-25-13: Summary of media coverage generated by this research since the release:
  - 8.5 million viewers via broadcast media
  - 400 million readers (print and online)
  - 12 million followers via Twitter

◆ SWUTC Project #161202: Developing the Urban Mobility Report

This continuing SWUTC effort provides funding to enhance and update the *Urban Mobility Report* (UMR) methodology, and support the dissemination of the report. The UMR is the most widely quoted report on urban congestion and its associated costs in the nation, and serves as a resource for decision-makers across the country. The methods and measures developed and used in the UMR have been successfully implemented for policy making and prioritizing congestion-mitigating projects.

The 2012 UMR includes two new ways to describe the effects of traffic congestion problems. Unpredictable travel time is given its own measure in the new report, and the environmental effects are addressed with an estimate of the carbon dioxide emitted in congested conditions. The usual measures of extra travel time and fuel consumed and the costs of those elements are also included in the dataset for 101 urban areas from 1982 to 2011. UMR findings benefit and support the USDOT strategic goals of economic competitiveness and environmental sustainability by facilitating the prioritizing of transportation improvement spending to get the highest investment return for the public and reduce congestion and its subsequent environmental impact.

Research results disseminated through:

- Final technical report: *2012 Urban Mobility Report*, David Schrank, Bill Eisele and Tim Lomax, December 2012.
- Website: http://mobility.tamu.edu/ums/
- RITA Spotlight Newsletter: http://www.rita.dot.gov/utc/sites/rita.dot.gov.utc/files/utc_spotlights/pdf/spotlight_0313.pdf
- Press release on February 5, 2013. First week coverage totaled:
  - 264 broadcast clips (6,736,726 audience circulation)
  - 1,366 print/online/radio articles (25,200,400 audience circulation)
  - 800,000 additional Facebook user and Twitter followers

◆ SWUTC Project #161242: Evaluating Safety Performance Guidelines for the Use of Right Turn on Red (RTOR)

This research investigated the safety performance of Right Turn on Red (RTOR) at intersections. And evaluated new design alternatives, such as dual right-turn lanes and guidelines incorporating the use of RTOR at intersections.

This research also produced a new model for gap-acceptance behavior on dual right-turn lanes. The model is capable of representing the unequal effects of conflicting traffic streams from different cross-street lanes on the gap-acceptance decisions of individual RTOR drivers from dual right-turn lanes,

enabling the enhancement of modeling of RTOR capacities of dual right-turn lanes in the future. This model has been published as an ASCE journal paper shown below.

The results of this research enhances traffic safety by reducing casualties and property damages due to traffic crashes related to RTOR through the comprehensive set of guidelines developed by the research team which support decision-making on the use of RTOR.

Research results disseminated through:

- Final technical report: *Evaluating Safety Performance and Developing Guidelines for the Use of Right Turn on Red (RTOR)*, Yi Qi, Xiaoming Chen and Da Li, December 2012.
- ASCE Paper: Empirical Study of Gap-Acceptance Behavior of Right-Turn-on-Red Drivers on Dual Right-Turn Lanes, Xiaoming Chen, Yi Qi, G. Liu, *Journal of Transportation Engineering*, 139(2), 173-180, February, 2013.

Plans for Next Reporting Period to Accomplish Research Goal:

- Provide support, guidance and assistance to project Principal Investigators to facilitate the achievement of individual research project objectives in compliance with approved work plans.
- Complete identification and activation of projects to be funded at the University of New Orleans.

SWUTC Goal #2: Education and Workforce Development Programs

With this grant, SWUTC will promote excellence and the preeminent status the education programs at each of the consortium member universities. This consortium nurtures world-class innovators in the education and preparation of transportation leaders for the emerging information-rich economy, through a continuing process of improvement in curriculum, courses and teaching methods.

Efforts Active January 1, 2013 – June 30, 2013:

◆ SWUTC **graduate scholarship programs** continue uninterrupted from old grant to new grant. The ultimate goal of the SWUTC graduate program is to prepare a highly qualified cadre of new professionals into transportation science. These programs provide stipends to students to participate in classroom and sponsored research activities. In addition, the program provides increased communications skills as students make presentations, participate in debates, and write proposals and reports. Students also participate in technical tours and professional meetings throughout the year.

Current Status:
Transportation Scholars Program at Texas A&M University - Number of students currently in program: 6 (full tuition, fees and stipend support)

Advanced Institute at the University of Texas at Austin – Number of students currently in program: 17 (receiving full tuition, fees and stipend support) 9 (just tuition and fees)

Graduate Stipend Program at Texas Southern University – Number of students currently in program: 8 (receiving stipend support)

◆ **Summer Undergraduate Fellows Programs**

The SWUTC Summer Undergraduate Fellows Programs at the University of Texas at Austin and Texas A&M University continue to be extremely successful recruiting endeavors to attract a diverse group of students into the graduate programs in transportation. Each year, the Summer Undergraduate Fellows Programs recruit juniors and seniors from other universities and from diverse academic backgrounds into a summer-long program in transportation research and education as a first step towards graduate study in

transportation. The students at both UT-Austin and TAMU have the opportunity to work with graduate students, faculty members, and researchers and are also exposed to research through meetings with project sponsors and weekly research seminars. Students make field trips to various transportation agencies and attend professional meetings such as the summer meeting of TexITE. At the end of the summer term, the students make presentations on their research and produce a paper for publication. At Texas A&M, the papers are published annually as a *Compendium of Student Papers* and posted on the SWUTC website.

Current Status:
Undergraduate Transportation Scholars Program (UGTSP) at Texas A&M University. 2013 program currently in progress. Number of students participating: 5.

Undergraduate Summer Internship in Transportation (USIT) at the University of Texas at Austin. 2013 program currently in progress. Number of students participating: 8.

◆ **Ph.D. Candidate Assistantship Program** at Texas A&M University:
This competitive program selects Ph.D. candidates for a maximum of 12 months of salary support while dissertation is being completed. No tuition or fees are paid. Candidates are chosen based on the quality and value of the proposed research. The goal of this program is to expedite the progress of students to complete doctoral requirements and begin their careers as transportation leaders.

Current Status:

2012 PhDCA Program:

FY12 Efforts Selected

Study Title	Student Name	Status
New Methodologies for Analyzing Freeway Traffic Flow Characteristics	Yajie Zou	In Progress
Analytic Models for Traffic Signal Control	Kai Yin	In Progress
Development of a Performance-Related Specifications Methodology for Pavement Preservation Treatments	Litao Liu	In Progress
Examining Decision-Making Surrounding the Use of Managed Lanes by Katy Freeway Travelers: A Prospect Theory Approach	Chao Huang	In Progress
Platoon-Based Arterial Signal Coordination with Uneven Double Cycling	Hongmin Zhou	In Progress
Fatigue Resistance of Asphalt Mixtures Affected by Water Vapor Movement	Yunwei Tong	In Progress

2013 PhDCA Program

Six proposals from PhD candidates received and are currently being reviewed by faculty. Faculty reviews to be completed by July 26th. Five proposals will be selected for funding. Anticipated activation of 2013 PhDCA Program research efforts - September 1, 2013.

◆ **Development of new planning course** at UT-Austin. (SWUTC Educational Initiative #161229)
This $10K effort enabled the development of a new six hour course, a practicum, which will be offered in the Community and Regional Planning Program at the University of Texas at Austin during the spring of 2014. This course will focus on freight planning. It will educate students on the conflicts and barriers

between freight and other land uses particularly on a megaregional scale. By exposing students to a series of readings, discussions, interviews, and a research/design project at the megaregional scale, students will gain a real world application of designing freight compatible communities.

During the preliminary stage of this effort, researchers reviewed transportation planning courses from across the country, and found that there is a lack of curricula that educates students on this topic. The SWUTC hopes to work with a couple of Class 1 Railroads in offering this course. Once the course has been offered a couple of times, we plan to share the content and success of the course with a broader audience.

Current Status:
Effort completed spring 2013. Course development documentation and tentative course outline available at: http://d2dtl5nnlpfr0r.cloudfront.net/swutc.tamu.edu/publications/technicalreports/161229.pdf

◆ **Transportation and Security Institute (TSI): Recruiting Next Generation Professionals** at Texas Southern University.
This program focuses on the mission and objectives of transportation security professionals and introduces a pre-selected group of high school students to the various career opportunities within the profession of transportation security. The objective of the TSI is to provide the framework that would expose high school students to the transportation security industry via hands-on technical activities, field trips to transportation facilities, lectures by transportation professionals, and on site seminars. Industry professionals will reinforce the importance of mathematics, science, and technology skills. Students will also observe how public/private partnerships work to strengthen the link between today's students and future transportation security needs.

Current Status:
The 2013 program is currently in progress. Graduation ceremony scheduled for July 19, 2013.

Refer to http://swutc.tamu.edu/2012/12/01/swutc-conducts-transportation-security-institute/ for complete overview of last year's program.

◆ SWUTC initiates development of **Hydraulics, Sedimentation and Erosion Control Laboratory - Hands-on Training and Education Center** at Texas A&M University. (SWUTC Project #161306)
The Texas A&M Transportation Institute's Hydraulics, Sedimentation and Erosion Control Laboratory is a leading research, testing and educational facility in soil erosion and storm water topical areas. The lab is continuously updating its expertise and services, and has lately moved into the new knowledge areas in low impact development techniques and green infrastructure. Expanding from the lab's current realm of activities, this project will provide a master plan that enables the lab to develop hands-on training for transportation professionals and provide high-impact education for students. The hands-on part is unique and fills the gap in those continuing education seminars/webinars offered in the market. It is envisioned that professional training, continuing education and high-impact learning experiences will be available to current Texas A&M University students, regional municipalities, and other professionals in the design and construction industries.

Current Status:
Effort ongoing – **Update:** During the spring 2013 semester, SWUTC sponsored graduate students from Texas A&M University's Landscape Architecture Department developed alternative master plans for the redesign of the HSECL into a premier comprehensive educational facility. The plans were then presented to a panel of faculty and research staff for review and evaluation on March 4th. These presentations can be viewed at: http://swutc.tamu.edu/2013/03/15/students-present-design-ideas-for-sedimentation-and-erosion-control-lab/

◆ **TxDOT Undergraduate Summer Internship** at Texas A&M University

The TxDOT Undergraduate Internship Program is a paid internship for two undergraduate engineering or planning students with an interest in transportation research. This is a full-time (40 hours/week) summer internship from May 20 to August 16, 2013. Interns will be mentored by senior transportation professionals as they participate on sponsored research efforts in the Texas A&M Transportation Institute's Austin office. Interns will also spend a day or two each week at TxDOT headquarters and gain a behind-the-scene look into the operations of a major state agency.

Current Status:
In progress- two students participating in 2013 program.

Plans for Next Reporting Period to Accomplish Education and Workforce Development Goal:

- Continue support of graduate scholarship programs at Texas A&M University, University of Texas at Austin and Texas Southern University, and the Ph.D. Candidate Assistantship Program at Texas A&M University.
- Support summer 2013 TSI program at Texas Southern University.
- Support summer 2013 TxDOT Undergraduate Summer Internship program.
- Support summer 2013 Undergraduate Fellows Programs at Texas A&M University and the University of Texas at Austin.

SWUTC Goal #3: Technology Transfer

Timely information, delivered to the right people is the desired outcome for SWUTC's technology transfer program. SWUTC supports a varied menu to techniques to transfer SWUTC derived results. These include continually updating the SWUTC website at http://swutc.tamu.edu/ with center news and downloadable publications. Publishing and distributing research final technical reports to 20 state and national libraries. And the support of SWUTC researchers as they present their research results through peer-reviewed publications and professional presentations.

Additional Current Initiatives:

◆ **SWUTC T2 Videos**

This initiative envisions the development of a total of five videos highlighting a significant SWUTC research or educational effort at each of the SWUTC consortium member universities for placement on the SWUTC website, *YouTube* and other social media sites.

First video produced: Voice-to-Text Apps Offer No Driving Safety Benefit; as with Manual Texting, Reaction Times Double http://vimeo.com/64641918

Plans for Next Reporting Period to Accomplish Technology Transfer Goal:

- Continue to update website with recent center activities and accomplishments.
- Publish final technical reports as individual research projects are completed in summer and fall of 2013.
- Select additional research/educational efforts to highlight through video format.

2. Products:

SWUTC Publications/papers/presentations for this reporting period:

Presentation: 2012 Travel Survey Symposium Results, Stacey Bricka, Texas A&M University, presented to TRB Applications Planning Conference, Columbus, Ohio, May 5-9, 2013. (Product of SWUTC Project #600451-00017)

Presentation: Effect of Graphite Types on Impacting Electrical Conductivity in Asphalt Composites, Philip Park, Aishwarya Baranikumar, Texas A&M University, presented at the AAPT 2013 Annual Meeting, Denver, CO, April 7-10, 2013. (Product of SWUTC Project #600451-00025)

Presentation: Development of a Methodology to Incorporate Co_2 Emission Estimates into the Urban Mobility Report, Tyler Fossett, Texas A&M University, presented at the 54th Annual Transportation Research Forum, Annapolis, MD, March 21-23, 2013.

Publication: Gap-acceptance Characteristics of Right-turn-on-red Drivers: An Empirical Study on Dual Right-turn Lanes, Xiaoming Chen, Yi Qi and Guanqi Liu, Texas Southern University, published in *ASCE Journal of Transportation Engineering*, February 2013. (Product of SWUTC Project #161242)

Publication: Diverge Models and Dynamic Traffic Equilibria, S. Boyles, T. Rambha, C. Melson and J. Duthie, University of Texas at Austin, Transportation Research Part B. (in review). (Product of SWUTC Project #600451-00065)

Publication: Traffic Sunlights: Houston Takes a hard Look at Solar-Powered Devices, Khosro Godazi, Texas Southern University, published in *Roads and Bridges*, January 2013. (Product of SWUTC Project #600451-00041)

Presentation: Pavement Maintenance Management through Network Partition, L. Gao and Z. Zhang University of Texas at Austin, presented at the 92nd Annual Transportation Research Board Meeting, Washington D.C., January 13-17, 2013. (Product of SWUTC Project #600451-00075)

Presentation: Study on Toll-Pricing Strategies for Managing Transportation Facilities in Design-Build-Finance-Operate Partnerships, H. Wu and Z. Zhang, University of Texas at Austin, presented at the 92nd Annual Transportation Research Board Meeting, Washington D.C., January 13-17, 2013. (Product of SWUTC Project #600451-00089)

Presentation: Real Time Optimization of Passenger Collection for Commuter Rail Systems, Yao Yu and Randy Machemehl, University of Texas at Austin, presented at the 92nd Annual Transportation Research Board Meeting, Washington D.C., January 13-17, 2013. (Product of SWUTC Project #600451-00068)

Presentation: Operational and Safety Effects of Using Left-Turn Lanes with Substandard Lengths at Unsignalized Median Openings: Case Study in Houston, TX, Xiaoming Chen, Yi Qi, Guanqi Liu and Jianing Wu, Texas Southern University, presented at the 92nd Annual Transportation Research Board Meeting, Washington D.C., January 13-17, 2013. (Product of SWUTC Project #161342)

Presentation: Mechanistic Modeling of Fracture in Asphalt Mixtures under Compressive Loading, Yuqing Zhang, Rong Luo and Robert Lytton, Texas A&M University, presented at the 92nd Annual Transportation Research Board Meeting, Washington D.C., January 13-17, 2013. (Product of SWUTC Project #600451-00006)

Presentation: 2012 Travel Survey Symposium Results, Stacey Bricka, Texas A&M University, presented to the full committee meeting for the Travel Survey Methods Committee and the Household Travel Survey Subcommittee at the 92nd Annual Transportation Research Board Meeting, Washington D.C., January 13-17, 2013. (Product of SWUTC Project #600451-00017)

Presentation: Incorporating Urban Area Truck Freight Value into Texas A&M Transportation Institute's Urban Mobility Report, David Schrank and Bill Eisele, Texas A&M University, presented at Session 248 of the 92nd Annual Transportation Research Board Meeting, Washington D.C., January 13-17, 2013. (Product of SWUTC Project #161202)

Presentation: How do Travelers Perceive and Value Travel Time Reliability, Mark Burris, Texas A&M University, poster presentation at the 92nd Annual Transportation Research Board Meeting, Washington D.C., January 13-17, 2013. (Product of SWUTC Project #161304)

Presentation: Estimating Urban Freight Congestion Costs: Methodologies, Measures, and Applications, David Schrank and Bill Eisele, Texas A&M University, presented at Session 407 of the 92nd Annual Transportation Research Board Meeting, Washington D.C., January 13-17, 2013. (Product of SWUTC Project #161202)

Presentation: Measuring and Reporting Travel Time Reliability Statistics for the Most Congested Corridors in the United States: Methodology and Results, David Schrank and Bill Eisele, Texas A&M University, presented at Session 760 of the 92nd Annual Transportation Research Board Meeting, Washington D.C., January13-17, 2013. (Product of SWUTC Project #161202)

Presentation: Local Highway Traffic Impacts on Truck Productivity in the Gulf Coast Megaregion, Dan Seedah, Garrett Fullerton, Travis Owens and Robert Harrison, University of Texas at Austin, presented at the 92nd Annual Transportation Research Board Meeting, Washington D.C., January 13-17, 2013 (Product of SWUTC Project #600451-00066)

Publication: Incorporating Spatial Dynamics and Temporal Dependency in Land Use Change Models, R. Sidharthan and C.R. Bhat, University of Texas at Austin, published in *Geographical Analysis*, Vol. 44, No. 4, pp. 321-349. (Product of SWUTC Project #600451-00063)

Websites and other social media utilized for this reporting period:
Project #161202: http://mobility.tamu.edu/ums/
http://mobility.tamu.edu/corridors/
Project #600451-00015: http://www.u-driver.com/
Facebook: https://www.facebook.com/UInTheDriverSeat
Twitter: UntheDriverSeat
Project #600451-00011: Vimeo: http://vimeo.com/64641918
Project #161242: http://ascelibrary.org/doi/abs/10.1061/%28ASCE%29TE.1943-5436.0000489
Project #600451-00063: http://www.ce.utexas.edu/prof/bhat/LandUse.html
Project #600451-00070:
https://www.facebook.com/home.php#!/CyclingInTheAfricanAmericanCommunity?fref=ts

Technologies or techniques for this reporting period:
- Findings from the SWUTC project #600451-00017 and symposium "Travel Surveys: Moving from Tradition to Innovation" have been moved into practice by assisting three regional Metropolitan Planning Agencies in the development of new travel surveys (Olympia, WA, Quad Cities, IL, and South Jersey).

In all three cases, the results of the symposium were used to ensure that the new surveys being designed incorporate symposium recommendations.

- The research team on SWUTC Project #600451-00062 - *Workability of Asphalt Binders at Mixing Temperatures for Hot and Warm Mix Asphalt* has developed a scientific procedure to measure the surface tension of asphalt binders at mixing temperatures. Surface tension is a critical material property that influences the ability of the binder to coat aggregate particles and is especially important in the context of warm mix asphalt.

Inventions/patent applications/licenses for this reporting period: Nothing to report at this time.

Other Products for this reporting period:

- Three Transit Signal Priority Optimization Models – Product of SWUTC Project #600451-00014
- Analytical model developed for estimating delays incurred by short median left-turn lanes – Product of SWUTC Project #600451-00044
- Development of model formulation to examine crash counts by injury severity/crash type. The modeling framework explicitly links a count data model (for crash counts) with an event type multinomial choice model (for injury severity/crash type) - Product of SWUTC Project #600451-00077
- Development of an agent-based model for autonomous shared vehicles, with an evaluation for environmental implications - Product of SWUTC Project #600451-00081
- Development of model for gap-acceptance behavior on dual right-turn lanes – Product of SWUTC Project #161242

3. Participants & Other Collaborating Organizations

Organizations as SWUTC Partners:
The following organizations provide personnel to serve as project monitors for SWUTC research projects. The responsibilities of a Project Monitor are to 1) maintain contact with the P.I. throughout the life of the project, 2) evaluate the progress of the research activities, 3) provide guidance to the P.I. to ensure that the research will produce usable results, and 4) review the reports emanating from the project.

Project monitors for FY12 research efforts still in progress:

California Legislative Analyst's Office – Contribution: In-kind support
Maryland State Highway Administration - Contribution: In-kind support
Heldenfels Enterprises, Inc. - Contribution: In-kind support
Rutgers University - Contribution: In-kind support
Precision Driving Research - Contribution: In-kind support
Michigan State University - Contribution: In-kind support
Minnesota DOT – Metro Division - Contribution: In-kind support
Dallas Area Rapid Transit - Contribution: In-kind support
Texas Department of Transportation-San Antonio District - Contribution: In-kind support
Texas Department of Transportation-Dallas District - Contribution: In-kind support
Texas Department of Transportation-Austin District - Contribution: In-kind support
George Washington University – School of Business - Contribution: In-kind support
Federal Highway Administration - Contribution: In-kind support
Washington State Department of Transportation - Contribution: In-kind support
Prairie View A&M University – Department of CE - Contribution: In-kind support
Port of Houston Authority - Contribution: In-kind support
Houston Metropolitan Transit Authority - Contribution: In-kind support
Traffic Engineers Inc. - Contribution: In-kind support

University of Nebraska-Lincoln – Dept. of CE - Contribution: In-kind support
RAND Corporation - Contribution: In-kind support
Energy Institute – UT-Austin - Contribution: In-kind support
Capital Area Metropolitan Planning Organization (Austin) - Contribution: In-kind support and exchange of personnel.
University of CA-Berkeley – Dept. of CE - Contribution: In-kind support
City of Austin-Public Works Department - Contribution: In-kind support
Applied Research Associates, Inc. - Contribution: In-kind support
Cintra US - Contribution: In-kind support and exchange of personnel.
NSF RCNetwork – Contribution: Exchange of personnel
BNSF Railway – Contribution: In-kind support

Project monitors for FY13 research efforts in progress:

Purdue University – NEXTRANS – Contribution: In-kind support
University of Texas at Austin–Department of Civil and Environmental Engineering. – Contribution: In-kind support
University of Southern California – Dept. of Industrial and Systems Engineering – Contribution: In-king support
Transportation Research Board of the National Academies – Contribution: In-kind support
Texas A&M University – Department of Geology and Geophysics – Contribution: In-kind support
UMTRI – Contribution: In-kind support
Kyung Hee University, Republic of Korea, Department of Civil Engineering – Contribution: In-kind support
West Virginia University, Department of Civil & Environmental Engineering – Contribution: In-kind support
Port of Victoria – Contribution: In-kind support
Southwest Research Institute – Intelligent systems Department, and Automation & Data Systems Division – Contribution: In-kind support
HNTB – Contribution: In-king support
City of Austin-Public Works Department-Bicycle/Pedestrian Project Coordinator - Contribution: In-kind support
Texas Department of Transportation-Austin District-Research & Technology Implementation Office - Contribution: In-kind support
Capital Area Metropolitan Planning Organization (Austin)-GIS, Demographic Forecasting and Travel Demand Modeling Office - Contribution: In-kind support

Additional partnerships for this reporting period:

University of South Florida – Center for Urban Transportation Research (CUTR) – Contribution: In-kind support (assisting with refinements in the Urban Mobility Report transit methodology) SWUTC Project #161202
University of Washington, Washington State Transportation Center (TRAC) – Contribution: In-kind support (assisting Urban Mobility Report researchers by facilitating data and information exchange with Washington DOT. The data are being used to investigate the truck time-of-day assumptions made in the Urban Mobility Report) SWUTC Project #161202
INRIX – supplying historical average speed dataset for use in project – SWUTC Project #161202
Texas Department of Transportation – Contribution – providing critical datasets for SWUTC Project #161304

Harris County Toll Road Authority - Contribution – providing critical datasets for SWUTC Project #161304

Federal University of Santa Maria, Brazil – Contribution: In-kind support for SWUTC Project #600451-00062

Mary Hill-retired dean of West Texas A&M - Contribution: In-kind support for SWUTC Project #600451-00015

Texas A&M – Corpus Christi – Contribution: In-kind support for SWUTC Project #600451-00015

Texans Standing Tall (http://www.texansstandingtall.org/) – Contribution: In-kind support for SWUTC Project #600451-00015

Arizona State University – Contribution: In-kind support for SWUTC Project #600451-00067

City of Austin – Contribution - providing engineering plans and information on detailed materials quantities used in residential and commercial development for SWUTC Project #600451-00067

MapMyFitness – Contribution – In-kind support. Provided 10 free GPS units for data collection use on SWUTC Project #600451-00070

Victoria Transport Policy Institute – Contribution: In-kind support for SWUTC Project #600451-00067

Louisiana Housing Alliance – providing information to identify research gaps in the region and the interaction of affordable housing and transportation – SWUTC Project #600451-00107

Greater New Orleans Community Data Center - – providing information to identify research gaps in the region and the interaction of affordable housing and transportation – SWUTC Project #600451-00107

Louisiana Department of Transportation and Development – providing information for the calibration of the Highway Safety Manual for roadway segments in Louisiana – SWUTC Project #600451-00102

4. Impact

Impact on the development of the principal disciplines of the program for this reporting period:

◆ **Civil Engineering/Urban Planning: Tool Produced for Policy Makers to Prioritize Congestion-Mitigating Projects.** This continuing SWUTC effort provides funding to enhance and update the *Urban Mobility Report* (UMR) methodology, and support the dissemination of the report. The UMR is the most widely quoted report on urban congestion and its associated costs in the nation, and serves as a resource for decision-makers across the country. The methods and measures developed and used in the UMR have been successfully implemented for policy making and prioritizing congestion-mitigating projects.

The 2012 UMR (released in February 2013) includes two new ways to describe the effects of traffic congestion problems. Unpredictable travel time is given its own measure in the new report, and the environmental effects are addressed with an estimate of the carbon dioxide emitted in congested conditions. The usual measures of extra travel time and fuel consumed and the costs of those elements are also included in the dataset for 101 urban areas from 1982 to 2011. UMR findings benefit and support the USDOT strategic goals of economic competitiveness and environmental sustainability by facilitating the prioritizing of transportation improvement spending to get the highest investment return for the public and reduce congestion and its subsequent environmental impact.

- **Civil Engineering/Safety:**
    - SWUTC Project #600451-00011: *An Evaluation of the Effectiveness of Voice-to-Text Programs at Reducing Incidences of Distracted Driving* – see complete project impact statement below in Impact on Society Beyond Science and Technology.
    - SWUTC Project #161242: *Evaluating Safety Performance and Developing Guidelines for the Use of Right Turn on Red (RTOR)* – see complete project impact statement below in Impact on Society Beyond Science and Technology.

Impact on other disciplines for this reporting period:
Nothing to report.

Impact on the transportation workforce development for this reporting period:

- **New Curricula Developed.** SWUTC developed a new six hour course, a practicum, which will be offered in the Community and Regional Planning Program at the University of Texas at Austin during the spring of 2014. This course will focus on freight planning. It will educate students on the conflicts and barriers between freight and other land uses particularly on a megaregional scale. By exposing students to a series of readings, discussions, interviews, and a research/design project at the megaregional scale, students will gain a real world application of designing freight compatible communities. Product of SWUTC Educational Initiative #161229: *Support for Community & Regional Planning Class Development.*

- **Provide Opportunities for Students to Participate in SWUTC Research.** SWUTC requires that students be involved in a meaningful way in the conduct of all SWUTC research efforts. During this reporting period, 55 graduate students and 28 undergraduate students were involved in the SWUTC research activities.

- **Graduate Scholarships Provided.** The SWUTC graduate scholarship programs provide stipends to students to participate in classroom and sponsored research activities. In addition, the program provides increased communications skills as students make presentations, participate in debates, and write proposals and reports. Graduate students supported this reporting period: 31

- **Undergraduate Summer Fellowships Provided.** This program recruits 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. Undergraduate students supported this reporting period: 13

- **Undergraduate Summer Internships Provided.** This program, supported by the Texas Department of Transportation, is a paid internship for two undergraduate engineering or planning students with an interest in transportation research. Undergraduate students supported this reporting period: 2.

- **Research Results Transferred to the Classroom.** Lecture developed for graduate-level course CVEN 613 *Micromechanics of Civil Materials* at Texas &M University. The advanced constitutive models and the testing results produced by SWUTC Project #600451-00006: *A Comprehensive Characterization of Asphalt Mixtures in Compression* were presented to and discussed with master and Ph.D. students at Texas A&M University. The raw testing data from this project were analyzed by the students using the coding programs in Excel VBA and Mathlab.

◆ **Students Develop Design Ideas for Erosion Control Lab.** During the spring 2013 semester, SWUTC sponsored graduate students from Texas A&M University's Landscape Architecture Department developed alternative master plans for the redesign of Texas A&M Transportation Institute's Hydraulics, Sedimentation and Erosion Control Lab (SECL) into a premier comprehensive educational facility. The plans were then presented to a panel of faculty and research staff for review and evaluation on March 4th. These presentations can be viewed at: http://swutc.tamu.edu/2013/03/15/students-present-design-ideas-for-sedimentation-and-erosion-control-lab/ Product of SWUTC Project #161306: *Designing the Hydraulics, Sedimentation and Erosion Control Laboratory to Become a Hands-on Training and Education Center*

Impact on physical, institutional, and information resources at the university or other partner institutions for this reporting period:
Nothing to report.

Impact of technology transfer for this reporting period:

◆ **Symposium Recommendations Moved into Practice.** Findings from SWUTC Project #600451-00017 and symposium *Travel Surveys: Moving from Tradition to Innovation* have been moved into practice by assisting three regional Metropolitan Planning Agencies in the development of new travel surveys (Olympia, WA, Quad Cities, IL, and South Jersey). In all three cases, the results of the symposium were used to ensure that the new surveys being designed incorporate symposium recommendations.

◆ **Research Results Incorporated into TxDOT Model.** Findings from SWUTC Project #600451-00066: *Multistate Megaregion Freight Planning Benefits: Evidence from Louisiana-Texas* were incorporated into the TxDOT Truck-Rail Intermodal Model. This toolkit will be applied to the Gulf Coast megaregion corridor to examine variables influencing rail freight movement along the corridor.

◆ **Informing the Public and Decision Makers.**

- SWUTC supported *Urban Mobility Report* - SWUTC Project #161201. See project summary included in Impact on Principle Disciplines section. First week media coverage after *Urban Mobility Report* press release on February 5, 2013:
  264 broadcast clips (6,736,726 audience circulation)
  1,366 print/online/radio articles (25,200,400 audience circulation)
  800,000 additional Facebook user and Twitter followers
- Press release generated April 25, 2013 on SWUTC Project #600451-00011: *An Evaluation of the Effectiveness of Voice-to-Text Programs at Reducing Incidences of Distracted Driving* produced the following. See project summary included in Impact on Society Beyond Science and Technology section.
  8.5 million viewers via broadcast media
  400 million readers (print and online)
  12 million followers via Twitter
- SWUTC Project #161242: *Evaluating Safety Performance and Developing Guidelines for the Use of Right Turn on Red (RTOR)* – the results of this research published in an ASCE *Journal of Transportation Engineering* article, enhances traffic safety by reducing casualties and property damages due to traffic crashes related to RTOR through the comprehensive set of guidelines which support decision-making on the use of RTOR.

Impact on society beyond science and technology for this reporting period:

◆ **Improved Driver Safety Awareness**. SWUTC Project #600451-00011: *An Evaluation of the Effectiveness of Voice-to-Text Programs at Reducing Incidences of Distracted Driving* - The study is the first of its kind, as it is based on the performance of 43 research participants driving an actual vehicle on a closed course. Other research efforts have evaluated manual versus voice-activated tasks using devices installed in a vehicle, but the SWUTC analysis is the first to compare voice-to-text and manual texting on a handheld device in an actual driving environment.

Through widespread media coverage of study results, this research had an impact on driver's perceptions, attitudes, behavior and knowledge about texting while driving and the potential impacts on driver safety. Specifically, the research improved public knowledge, attitudes, skills and abilities, in addition to facilitating changes in behavior, practices, decision making, policies (including regulatory policies), and social actions.

◆ **Traffic Safety Enhancement**. SWUTC Project #161242: *Evaluating Safety Performance and Developing Guidelines for the Use of Right Turn on Red (RTOR)* - This research investigated the safety performance of Right Turn on Red (RTOR) at intersections. And evaluated new design alternatives, such as dual right-turn lanes and guidelines incorporating the use of RTOR at intersections.

This research enhances traffic safety by reducing casualties and property damages due to traffic crashes related to RTOR through the comprehensive set of guidelines developed that will support decision-making on the use of RTOR.

◆ **Study Results Guide Municipalities in Green Energy Applications to Traffic Control**. SWUTC Project #600451-00041: *The Impact of the Conversion of Incandescent Bulbs to LED Bulbs Traffic Signals in Houston: A Step toward Sustainable Control Devices* examined the deployment of solar-powered traffic control devices by evaluating the installation and maintenance costs of solar panels and LED retrofits versus traditional incandescent bulb installations. Using data gathered in Houston, Texas researchers found that retrofitting traditional incandescent bulbs to LED, while initially costly, will yield benefits in less than five years. And with the installation of solar panels, energy consumption would be pushed to virtually zero. With the solar panel's 35-40 year life span, the long-term benefits of their installation outweigh the initial costs. This study provides a valuable resource to city planners on the cost-benefit of converting traditionally powered traffic control devices to green energy.

◆ **Promoting Safe Driver Behavior**. SWUTC Project #600451-00015: *U in the Driver Seat.* Car crashes are the number-one killer of Americans under the age of 25, and alcohol use stands out as one of the most common contributors to these crashes. In an effort to reverse this alarming trend, SWUTC developed a peer-driven outreach program - U in the Driver Seat (UDS). This program which organizers hope to spread statewide focuses on this high-risk group and is modeled after Texas A&M Transportation Institute's successful Teens in the Driver Seat® (TDS) program, a peer-to-peer safety program for America's youth that has been implemented in more than 500 Texas high schools. This safety education effort uses the same successful methods developed by the TDS program to educate young college age drivers about the specific driving dangers associated with driving at night, speeding, drinking and driving, cell phones/texting, and failing to use seat belts.

5. Changes/Problems

Nothing to report