

UTCA

University Transportation Center for Alabama



2011 Annual Report

Message from the Executive Director



The UTCA

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2011 Annual Report

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In June, 2011, RITA Administrator Peter Appel informed the university transportation centers (UTC) that the 59 current UTC Program grants would not be funded for Federal Fiscal Year 2011 but that a new rendition of the UTC program would be fully funded for that year. July saw the release of the grant solicitation from RITA, and, after a whirlwind competition, new awardees were announced in January, 2012. Two members of the three-member UTCA coalition—The University of Alabama at Birmingham and The University of Alabama in Huntsville—were part of new, funded coalitions. The third UTCA member—the University of Alabama—was not funded from the competition.

The three members of UTCA worked together for calendar year 2011, and that work is described in this Annual Report. Though the original UTCA coalition will not be funded once Federal Fiscal Year 2010 funds have been expended, RITA funding for UTCA has left all three institutions better placed to provide the transportation community with the education, research, and technology-transfer activities for which UTCs were created.

Sincerely,
Jay K. Lindly



COVER PHOTOS: Left: The director of the Alabama Department of Transportation (ALDOT), Mr. John Cooper, addresses ALDOT's 2011 Peer Exchange, hosted by the University of Alabama at Birmingham. See page 15. Middle: Moses Tefe, UTCA Student of the Year, joins other outstanding University Transportation Center students at the 91st Annual TRB meeting. Mr. Tefe is sitting fourth from the right in the first row. See page 22. Right: Dr. Jay Lindly teaches a pavements class to students at UA and UAH using the Intercampus Interactive Television System. See page 27.

Mission and Theme



FIGURE 1. Bevill Building, home of The UTCA headquarters

The University Transportation Center for Alabama (UTCA) was created by a resolution of the Board of Trustees of The University of Alabama System (UA System) and began operation on March 15, 1999. The *Transportation Equity Act for the 21st Century (TEA-21)*, Public Law 105-178, provided initial funding and established the UTCA as a “university transportation center” (UTC) under the US Department of Transportation’s Research and Innovative Technology Administration (RITA). The UTCA now operates as a Title III UTC under the *2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)*.

The UTCA conducts transportation education, research, and technology-transfer activities throughout the state and region. All faculty and staff members from The University of Alabama (UA), The University of Alabama at Birmingham (UAB), and The University of Alabama in Huntsville (UAH) are eligible to conduct projects in these service areas.

Mission

The UTCA mission contributes to the overall mission of the US Department of Transportation (USDOT). Specifically, The UTCA seeks

to advance technology and expertise in the multiple disciplines that comprise transportation through the mechanisms of education, research, and technology transfer while serving as a university-based center of excellence (*2006 UTCA Strategic Plan*, p. 12).

Theme

Our theme—*Management and Safety of Transportation Systems*—reflects the transportation needs of Alabama and the expertise of The University of Alabama System faculty. In allocating UTCA funding, the Executive Committee and Board of Advisors give priority to programs and projects that closely follow this theme. Several management-research projects now focus on maximizing traffic management and minimizing congestion. Similarly, safety research projects may now highlight infrastructure sustainability.

Management Structure



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The UTCA headquarters is located in the Bevill Building on The University of Alabama campus. Each campus (UA, UAB, and UAH) has a branch office operating under the direction of an Associate Director. The Executive Director and Associate Directors form the Executive Committee, which provides guidance and direction for Center activities. Faculty members engaged in UTCA projects work in their own offices on their own campuses.

The Executive Committee and the two staff members shown below are continuously assigned to UTCA, all on a part-time basis. Researchers from the three campuses are engaged for only the life of a project.

Mrs. Connie Harris; Administrative Secretary, UA: charris@eng.ua.edu
Mr. Joseph Walsh; Editorial Assistant, UA; jtwalsh@eng.ua.edu

**Management
Structure**

2011-2012 Advisory Board

Transit Agencies & Organizations

Mr. Steve Ostaseski, Chair
Regional Planning Commission for
Greater Birmingham
Birmingham, AL

FHWA Representative

Mr. Mark Bartlett, Vice-Chairman
Division Administrator
Federal Highway Administration
Montgomery, AL

Academic Research

TBA

City Engineer

Mr. Joe Robinson
City of Tuscaloosa (AL) Engineer
Tuscaloosa, AL

County Engineer

Mr. Randy Cole
Shelby County (AL) Engineer
Columbiana, AL

Municipal Planning Organizations

Mr. James Moore
Transportation Planner
City of Huntsville (AL)
Huntsville, AL

Logistics/Commercial Vehicles

TBA



The UTCA has a strong Advisory Board. Members include representatives from public and private transportation-related fields and organizations. The Advisory Board takes an active role in guiding operations and establishing the direction of growth for the Center, particularly in the areas of research and technology transfer. Its members initiate the *Annual Research Plan*, review proposals, and evaluate UTCA's annual accomplishments and progress.

Highway Representative (Design)

Mr. Don Arkle
Assistant Chief Engineer for
Policy and Planning
Alabama Department of Transportation
Montgomery, AL

Highway Representative (Geotechnical & Materials)

TBA

Highway Representative (Maintenance)

Mr. George Conner
State Maintenance Engineer
Alabama Department of Transportation
Montgomery, AL

Transportation Engineering

Mr. James Brown
Gonzalez-Strength & Associates, Inc.
Birmingham, AL

Construction Industry

Mr. Billy Norrell
Executive Director
Alabama Road Builders Association
Montgomery, AL

FHWA Representatives

Mr. Eddie Curtis
Traffic Management Specialist
Office of Transportation Management
FHWA Resource Center
Atlanta, GA

Research Project Selection

The UTCA continues to encourage all faculty members in the UA System to compete for project funding. The Advisory Board and Executive Committee create an *Annual Research Plan* to define research topics of highest importance. Peer experts review proposals and recommend projects for funding.

A large number of faculty members have participated in this process, as illustrated in **TABLE 1** and **TABLE 2**. The degree of participation has exceeded the initial goals of the Executive Committee and has produced a large network of interdisciplinary transportation experts.

TABLE 1. Research selection (UTC funds)

Grant Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Different PIs	13	8	11	10	16	17	14	12	10	6	9	8	12
New PIs	13	6	3	6	6	6	4	3	2	1	4	1	3

TABLE 2. Principal investigators

Grant Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
Proposals	55	61	49	40	63	53	67	53	37	27	23	25	36	528
Projects Funded by UTCA	14	9	11	10	19	19	17	15	10	7	10	8	10	141

Overview of Research Program

The UTCA will have an ongoing program of basic and applied research, the products of which are judged by peers or other experts in the field, to advance the body of knowledge in transportation (2006 Strategic Plan, p. 16).

Overview of Budgeted Revenues and Expenditures for New Projects

Budgeted Sources of Revenue for New Projects in 2011

As shown in **TABLE 3**, The UTCA received nearly three-fifths of its revenue for new projects funded in 2011 from RITA's University Transportation Centers Program. The Alabama Department of Transportation (ALDOT) was also an important source of revenue for new projects: it provided almost 40% of UTCA funds. Additionally, UTCA received funds from the Alabama Department of Public Health and matching funds from participating universities.

FIGURE 2 illustrates the relative roles of these funding sources.

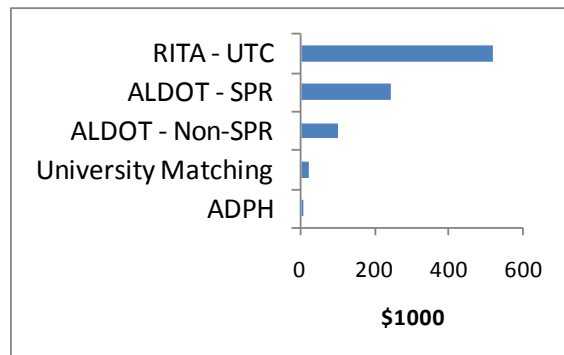


FIGURE 2. UTCA revenue sources for new projects funded in 2011

TABLE 3. 2011 Budgeted Revenue Sources and Expenditures for New Projects (\$1000)

REVENUE SOURCES		
RITA - UTC	\$ 520	58%
ALDOT - SPR	\$ 242	27%
ALDOT - Non-SPR	\$ 99	11%
University Matching	\$ 23	3%
ADPH	\$ 6	1%
TOTAL	\$ 890	100%
EXPENDITURES		
Management	\$ 712	63%
Administration	\$ 162	14%
Tech Transfer	\$ 99	9%
Education	\$ 75	7%
Bridge	\$ 68	6%
Safety	\$ 6	1%
TOTAL	\$ 1,122	100%

Even though only 9% of expenditures focused exclusively on technology transfer activities in 2011, UTCA faculty were active in a number of technology transfer activities. **See pages 14-20 of this Annual Report for specific examples.**

Budgeted Expenditures for New Projects in 2011

TABLE 3 also shows UTCA expenditures in 2011. Roughly 14% of expenditures were related to the administration of UTCA. The remaining 86% was spent on projects. Management was by far the largest category of expenditures for new projects funded in 2011. Technology-transfer projects accounted for 9% of the 2011 budget, and education- and bridge-related projects consumed 7% and 6% of the budget respectively. About 1% of UTCA's 2011 budget went to a safety project.

FIGURE 3 illustrates the breakdown of expenditures. The UTCA emphasis on management and safety is reflected in spending: together they account for 64% of expenditures.

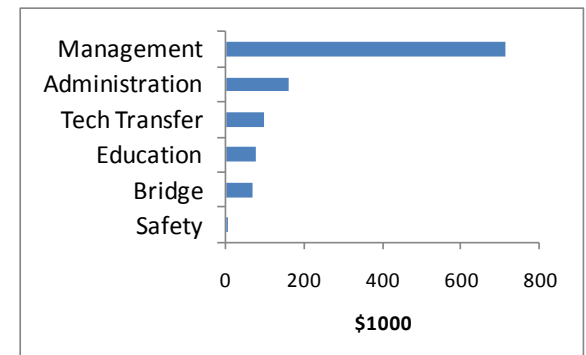


FIGURE 3. UTCA expenditures for new projects funded in 2011

New Projects Funded in 2011

The UTCA funded ten projects with 2011 UTC monies. An additional four projects were funded by external agencies. These projects are briefly described in the following pages. Externally funded projects are identified by a “4” as the third digit in the UTCA project-numbering system. We invite readers to visit <http://utca.eng.ua.edu/projects/> for additional information on these and other UTCA projects.

Project #11101 – Advanced Transportation Institute 2011, Dr. Daniel Turner, Principal Investigator, UA. The objective of the Advanced Transportation Institute 2011 (ATI-11) was to increase diversity within the transportation profession by introducing junior and senior high-school students from underrepresented groups to transportation careers. The UTCA and the Alabama Department of Transportation (ALDOT) Fifth Division co-sponsored the Institute. The agenda for the three-day program included presentations on topics such as transportation careers, how to select and enter a university, and how to obtain scholarships. Practitioners made additional presentations on various sectors of transportation, including planning, design, construction, maintenance, traffic engineering, and bridge design. The Fifth Division personnel office recruited and selected ATI-11 participants from local high schools. See page 25 for details.

Project #11103 – Role of Transit Service Providers in Land Development, Yingyan Lou, Principal Investigator, UA. The objective of this project is to investigate whether encouraging (and subsidizing) transit service providers to compete and invest in land development improves livability and sustainability. A comprehensive literature review and interviews with field experts will explore the policy implications and direct benefits of this strategy to the transit industry and the economy. A synthesis of this strategy and a summary of expert opinions will be prepared, and insights for the transit-oriented development in US will be provided. The results of this study will contribute to the discussion over not only well-functioning and cost-effective transit systems but also more livable and sustainable communities.



FIGURE 4. Transit providers play an important role in land development. UTCA Project #11103 investigates whether encouraging them to compete in land development leads to more livable space. (Photo reproduced with permission from Peter Eckert and Mithun)

Project #11106 – Alabama Transportation Strategic Vision, Steven Jones, Principal Investigator, UA. The objective of this project is to lead a group of stakeholders in developing a strategic vision for Alabama public transportation for the year 2030. The project will employ participatory scenario planning to build and document consensus for a sustainable role for public transportation in Alabama. Dr. Jones expects the results to form the basis of improved public transportation in future local, regional, and state transportation-policy development and decision making and ultimately of a more sustainable transportation system for Alabama.

Project #11108 – Impact of Nighttime Construction on Work Quality, David Grau, Principal Investigator, UA. Despite an increasing demand for scheduling roadway and highway work at night, little research considers the impact of nighttime construction on the quality of work. Dr. Grau will use an experimental design

New Projects Funded in 2011

not only to compare the quality of nighttime and daytime construction but also to determine the influence of varying nighttime factors on the quality of the finished work. He will investigate up to 10 similar construction operations for both daytime and nighttime conditions and use statistical methods 1) to assess the differences between nighttime and daytime construction on the quality of the finished work and 2) to correlate the influence of nighttime factors with the quality of the performed work. See page 12 for more information.

Project #11113 – Advanced Patrol Routing with On-Call Response for Effective Resource Management, Burcu Keskin, Principal Investigator, UA. Effective public safety depends partly on effective resource allocation. Previous UTCA-sponsored research has considered where police should patrol to minimize crash hotspots (UTCA #09104), but it did not consider the full range of possible solutions. This project extends that work to include the integrated optimization of the selection of intermediate patrol locations and determination of trooper patrol routes with dynamic on-call capabilities.

Project #11202 – Effect of Increasing Truck Weight on Bridges, Christopher Waldron, Principal Investigator, UAB. The US House of Representatives proposed legislation (HR 1799, 2009) allowing a 17,000-pound increase in the maximum gross vehicle weight on the Interstate Highway System. This project's main goal is to quantify the effect of this weight increase on the internal forces to which typical slab-on-girder bridges are subjected. To investigate the longitudinal force effects in the girders and the transverse force effects

in the deck slab, several configurations for these heavier trucks proposed in the literature will be developed and evaluated as required to minimize the increased force effects.

Project #11206 – Impacts of Transit in a Complete Streets Context, Virginia Sisiopiku, Principal Investigator, UAB. This project

will identify and summarize analytical methods appropriate for estimating transit's economic benefits as they relate to travel, economic development, society, and health. Using input from earlier studies, national and regional data, and available methods, the research team will quantify both health-related and economic impacts of transit integration in a complete-street environment and will present recommendations for incorporation locally and nationally. Page 13 has more.

Project #11301 – Transportation Engineering Advancement and Mentoring Program, Kathleen Leonard, Principal Investigator, UAH. The Principal Investigator will continue to work with local school districts to incorporate transportation engineering-related topics into the science curriculum. This year's summer program will have a concentration in energy technologies. Students will use real-world examples and new technologies in their activities. See page 26 for an article about last year's awards program.

Project #11305 – Analysis of Rural Public Transit in Alabama, Michael Anderson, Principal Investigator, UAH. As rural Americans

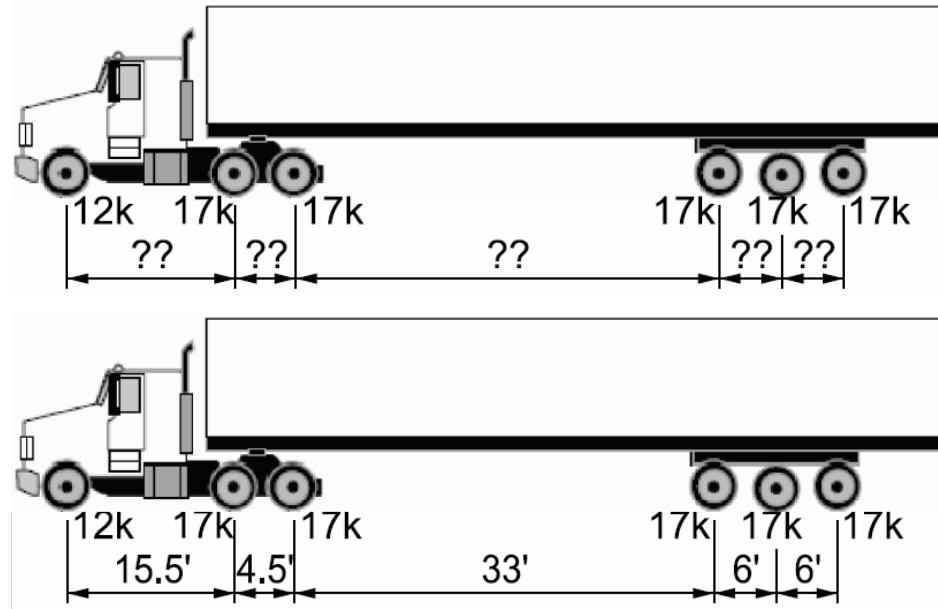


FIGURE 5. In UTCA Project #11202, Dr. Christopher Waldron is investigating the longitudinal force effects in the girders and the transverse force effects in the deck slab using various axle spacings. Top: HR 1799 proposed spacings. Bottom: TRB-proposed spacings. (Photo: Weissman and Harrison 1998)

New Projects Funded in 2011

grow older, access to basic necessities and health care will continue to strain rural transit providers. The goals of this project are to identify where rural transit needs to improve and what steps can improve performance to better serve the citizens of Alabama. The project will use Transit Cooperative Research Project Report 136, *Guidebook for Rural Demand-Response Transportation: Measuring, Assessing, and Improving Performance*, to calculate performance measures for the transit providers in Alabama. Feedback to the providers will supply them with methods to improve their rural transit services.



FIGURE 6. A ClasTran bus. ClasTran gives rides to the elderly, the disabled, and the residents of rural areas in Jefferson and Shelby counties. In UTCA Project #11305, Dr. Anderson is working to help improve these types of services.

Project #11306 – Student Funding to Attend TRB Conference, Michael Anderson, Principal Investigator, UAH. The objective of this project is to develop a student research symposium—to be hosted by the Institute of Transportation Engineers (ITE) student chapter at the University of Alabama at Birmingham (UAB)—and to select deserving students from each of the three University of Alabama System campuses to receive funding to attend the Transportation Research Board Annual Meeting in Washington, DC. See page 21 for more.

Project #11401 – Additional Introductory Training on the AASHTO Highway Safety Manual, Daniel Turner, Principal Investigator, UA. The goal of this project was to provide additional introductory training on the AASHTO Highway Safety Manual (HSM) to those persons involved in safety studies and safety decisions within the Alabama Department of Transportation (ALDOT). The AASHTO HSM represents a significant enhancement in quantifying roadway safety and introduces many new terms and methodologies. This training provided an overview and understanding of the content and use of the HSM. There were two two-day sessions to

provide participants with a more complete understanding of the terminology, methodologies, data requirements, modeling, calibration, and other aspects of HSM implementation. The training gave a uniform understanding of the HSM to 80 managers and employees who are likely to use the HSM in making decisions or in approving and funding those decisions. Participants included Division traffic engineers and central-office personnel representing traffic, safety, planning, design, and other areas. See page 14.

Project #11402 – Contraflow Evacuation Planning for I-65 in Alabama, Yingyan Lou, Principal Investigator, UA.

The goal of this project is to assist the Alabama Department of Transportation (ALDOT) in the planning of contraflow operations for hurricane evacuation along I-65. The project will study how ALDOT can reverse one direction of the roadway to accommodate the substantially increased travel flow moving from the impact area. One problem faced by ALDOT is schedul-



FIGURE 7. The first I-65 crossover for contraflow, near Mobile, Alabama. (Photo: ALDOT)

New Projects Funded in 2011

ing the contraflow process. The timing for the deployment of equipment and personnel and the initiation and termination of contraflow impact the effectiveness, safety, and cost of the operation. The researchers will investigate methodologies and develop a modeling framework to determine the onset and duration of contraflow. They will also create a set of look-up tables and a prototype computer tool to assist ALDOT in planning contraflow evacuation. Different from previous studies, this research will feature: (1) a well-established and reliable meso-scopic traffic flow simulation, the cell transmission model; (2) robust and stochastic optimization techniques to determine the onset and duration of contraflow; (3) incident identification and characterization using artificial intelligence techniques; (4) a sensitivity analysis to account for inaccurate estimation of evacuee's route-choice behaviors. The project team will work closely with ALDOT to ensure that the models, algorithms, and prototype computer tool are customized to their needs.

Project #11403 – Revenue Enhancement Alternatives for the Alabama Department of Transportation, Jay Lindly, Principal Investigator, UA. Due to the weakening economy, the ever-improving fuel efficiency of vehicles, and other factors, the traditional funding sources for surface transportation, motor fuel taxes, are having difficulty generating sufficient revenue to meet highway construction and maintenance needs. To provide specific, useful information concerning the potential transportation funding crisis and potential practical alternatives in the state of Alabama, this research proposes to focus on four areas. First, the research will survey Alabama citizens to determine their attitudes toward both current revenue methods and revenue enhancement alternatives. Second, the research will project annual costs and revenues involved in levying tolls on all Interstate highways in Alabama. Third, it will investigate alternatives to determine whether replacing or supplementing the current fuel tax with road user fees is palatable to Alabamians and is technically feasible in the state. Finally, it will select, investigate, and project the potential of several other revenue-enhancement alternatives to fill the funding gap that the Alabama Department of Transportation (ALDOT) will soon face.

Project #11404 – Selection of Observation Sites for 2012 Alabama Occupant Restraint Survey, Yingyan Lou, Principal Investigator, UA. The objective of this project is to select observation sites for a new occupant restraint survey design being prepared by the Alabama Department of Public Health (ADPH). In April 2011, the National Highway Traffic Safety Administration (NHTSA) finalized earlier revisions to the Uniform Criteria for State Observational Surveys of Seat Belt Use from its 1998 version. In view of these changes, necessary revisions to the Alabama occupant restraint survey design are needed and are required to be submitted to NHTSA for approval by January 3, 2012. The revisions are mainly focused around the selection of sample sites and the weighting formulas for calculating the average seat belt usage rate. As one subtask in the design of a new survey plan in compliance with the new Uniform Criteria, this project will focus on the selection of exact observation sites, where the number of desired sites for each pre-selected county will be provided by ADPH.

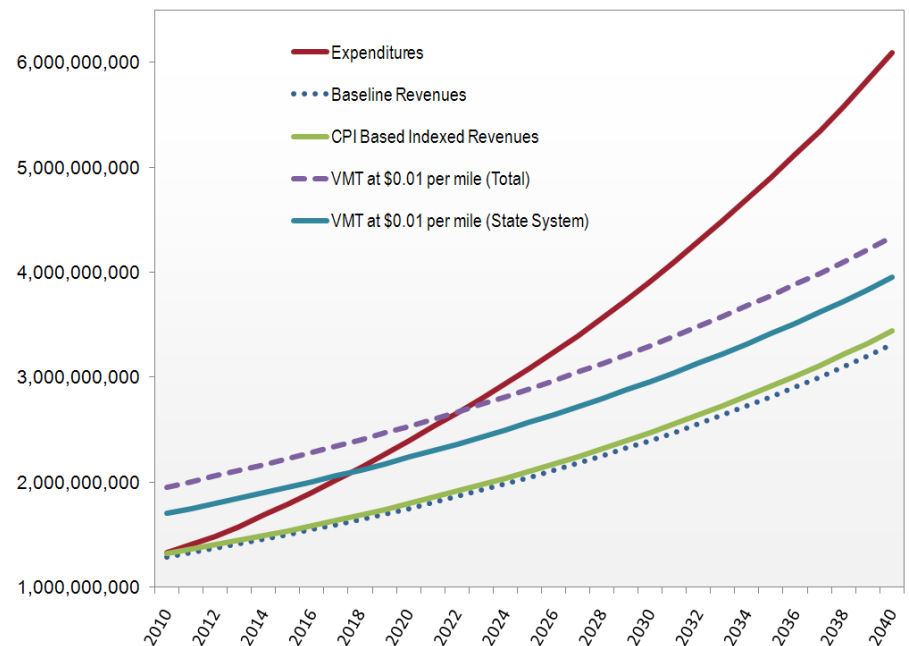


FIGURE 8. Projected shortages in transportation funding. In UTCA Project #11403, Dr. Jay Lindly's team is considering revenue alternatives to address these shortfalls.

The Effect of Nighttime Construction on Quality

In recent years, federal and state transportation agencies have increasingly moved from daytime to nighttime construction operations to reduce traffic congestion and delays. Despite this increased emphasis on nighttime construction, little is known about the quality



and safety of roadway and highway construction performed at night. Not only do we lack knowledge about how nighttime construction compares with daytime construction; we also do not know how quality varies with

nighttime conditions. In **UTCA Project #11108, *Impact of Nighttime Construction on Work Quality***, Dr. David Grau, Assistant Professor of Construction Engineering at The University of Alabama (UA), and Dr. Edward Back, Associate Professor and Director of Construction Engineering at UA, seek to improve our understanding of how construction performed at night influences road durability and safety.

Dr. Grau and Dr. Back have teamed with the Alabama Department of Transportation (ALDOT) to answer these questions. They are drawing on ALDOT's practices and historical data and are collecting data at Alabama construction sites on several factors that may influence the quality of nighttime construction operations, such as the quality and uniformity of luminance; glare; worker fatigue, concentration, and pace of work; presence of a supervisor or quality inspector during construction; traffic volume; and temperature. Once the data are collected, Dr. Grau and Dr. Back will use statisti-

cal methods to compare the differences between the quality of the work performed at night and the quality of the work performed during the day. They will also correlate nighttime factors with the quality of the performed work and will correlate traffic accidents with nighttime and daytime construction. Dr. Grau and Dr. Back will use these correlations to characterize root causes of construction quality and safety.

Despite the increasing use of nighttime work to deliver transportation projects, there is neither a uniform set of guidelines nor best practices at the national level to manage nighttime operations. This project will eventually help address these shortcomings by offering guidance to improve the quality of planning and construction work. It will also provide a solid base for future research into these issues.

Look for the final report on UTCA's website (<http://utca.eng.ua.edu/>) in 2012.



VMS Support Structures

Dr. Fouad H. Fouad and Dr. Ian Hosch of the University of Alabama at Birmingham (UAB) are working with the Alabama Department of Transportation (ALDOT) to improve the design of bridge-type variable message sign (VMS) support structures. In **UTCA Project #09203, Design of VMS Bridge Support Structures for Fatigue Loads**, they are investigating the vulnerability of these structures to wind-induced fatigue and developing design standards.

Although there are many types of overhead support structures in operation on DOT highways, overhead variable message sign (VMS) support structures are particularly susceptible to wind-



FIGURE 9. Bridge-type overhead VMS support structure

VMS support structures have natural frequencies of vibration close to the frequency of natural- and truck-induced wind gusts. As a consequence, these structures operate in a near-resonant condition on a daily basis, which puts them at risk to fatigue.

Drs. Fouad and Hosch instrumented a typical bridge-type VMS support structure with gauges to monitor the structure's dynamic behavior under fatigue loading. They conducted an operational modal analysis to estimate the structure's vibration characteristics, such as its natural frequency, damping percentages, and vibratory modal shapes. They are using this information to develop design fatigue loads for inclusion into design specifications.

induced fatigue: even minor gusts from passing semi-trailer trucks can weaken the support structures. Their vulnerability has to do with their frequency of vibration.

Bridge-type

Transit in Complete Streets

In early 2010, the USDOT released a Draft Strategic Plan for 2010-2015 that identified building more “livable” communities as a strategic objective of the Department. Therefore, research on the impact of transit integration in a “complete street” environment is timely and needed, especially given that many of the possible gains from such integration are not fully understood and properly measured. Dr. Virginia Sisiopiku of the University of Alabama at Birmingham is leading **UTCA Project #11206, Impacts of Transit in a Complete Streets Context**, to better understand the effect of transit availability on livability and human health.

Dr. Sisiopiku's research team first identified and summarized analytical methods appropriate for estimating transit's economic benefits as they relate to travel, economic development, societal, and health impacts. Then the team selected a local community as a test bed and proposed changes in transit coverage and other interventions aimed at making the surrounding environment more livable and transit-friendly. Finally, they calculated the economic- and health-related costs and benefits of transit integration to individuals and communities.



FIGURE 10. Complete streets are designed to enable pedestrians, bicyclists, motorists, and public-transport users of all ages and abilities to move safely and comfortably. (USDOT 2010)

Once it is published, the analysis will help transportation, transit, and health professionals recognize the many benefits of transit-oriented developments. It is also likely to encourage stakeholders to better coordinate their future efforts toward creating “livable” communities that offer healthy and sustainable transportation choices for all.

Overview
of
Technology
Transfer
Program

The UTCA will provide readily-available research results to potential users in a form that can be directly implemented, utilized, or otherwise applied (2006 Strategic Plan, p. 23).

Highway Safety Manual Training

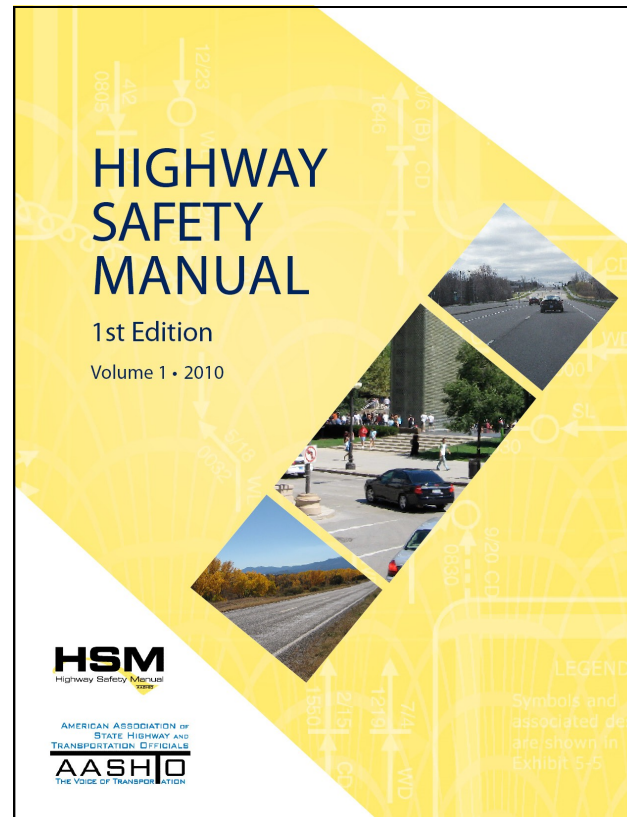
The American Association of State Highway and Transportation Officials (AASHTO) published the first edition of the *Highway Safety Manual* (HSM) in 2010. The HSM represents a significant improvement in quantifying roadway-safety countermeasures and introduces many terms and methodologies. However, the HSM is 972 pages long, its methodologies are complex, and it uses new software, making it difficult to effectively implement the HSM's contents. Through **UTCA Project #10402, Training for the Highway Safety Manual**, and **UTCA Project #11401, Additional Introductory Training for the Highway Safety Manual**, Dr. Dan Turner and Dr. Steven Jones worked with CH2M HILL to give the Alabama Department of Transportation (ALDOT) a head start on implementing the HSM by providing ALDOT managers and employees with an overview of the HSM.

Drs. Turner and Jones tailored the sessions for ALDOT personnel. Decisionmakers have less need for an intimate understanding of the HSM than do ALDOT division design engineers and traffic engineers, so the

sessions were divided in two. Forty transportation professionals—professors associated with ALDOT activities and high-level managers from ALDOT's Central Office and Division Offices, the Federal Highway Administration, and the Alabama Department of Public Safety—received a two-hour overview of the content and use of the HSM with a focus on terminology and concepts, giving them a feeling for the use of the HSM and its potential for improving safety decision making.

Another 160 employees of state and federal agencies — including division design engineers, traffic engineers, and engineers from safety, planning, and other bureaus and sections — received two days of HSM instruction. The longer training allowed for a more detailed overview, so participants could have a more complete understanding of the terminology, methodologies, data needs, modeling, calibration, and other aspects of HSM implementation.

This training, combined with another UTCA Project—**#10404, Scoping Study for Implementation of the Highway Safety Manual in Alabama**—has helped ALDOT get a good start on taking advantage of the benefits offered by the HSM.



UAB Hosts ALDOT's 2011 Peer Exchange

On May 10, the Department of Civil, Construction, and Environmental Engineering at the University of Alabama at Birmingham (UAB) hosted the Alabama Department of Transportation's (ALDOT) 2011 Peer Exchange, a forum for transportation professionals in the state to meet and discuss ideas. This year's Exchange had several themes: university collaboration, research management in the electronic age, research-project selection and program expansion, and research-program outreach and marketing. Transportation faculty from all three UTCA campuses participated.

Dr. Steven Jones, associate professor at UA; Dr. Fouad Fouad, UTCA associate director and professor and department chair at UAB; and Dr. Houssam Toutanji, UTCA associate chair and professor and department chair at UAH gave presentations on their campuses' transportation-research activities and networked with other transportation professionals.

Mr. Jeffrey Brown and Ms. Michelle Owens of the ALDOT Bureau of Research and Development initiated this year's program. There were about 40 attendees, including ALDOT senior management, the ALDOT Research Advisory Committee (RAC), and the Federal Highway Administration. ALDOT's new director, Mr. John Cooper, attended and delivered an address during the opening session. The meetings produced fruitful discussions and results that not only highlighted the accomplishments of the ALDOT Bureau of Research and Development but also opportunities to enhance that research program.



FIGURE 11. ALDOT Director John Cooper at the 2011 Peer Exchange

UA ITE Hosts Spring 2011 ALSITE Meeting

The Alabama Section of the Institute of Transportation Engineers (ALSITE) held its spring meeting at The University of Alabama (UA) campus in Tuscaloosa on March 3, 2011.

ALSITE's annual spring meeting combines technical engineering presentations with an organizational business meeting. This year's meeting featured presentations on sustainability and innovation in transportation engineering. Dr. Andrew Graettinger, associate professor at UA, spoke about increasing the environmental friendliness of Alabama's highways. Dr. Yingyan Lou, assistant professor at UA, discussed sustainability as it relates to transportation development, finance, and operations. Mr. Blair Perry and Mr. Kent Black, engineers at Gresham Smith & Partners, discussed diverging diamond interchanges, in which traffic temporarily flows on the opposite side to improve safety and efficiency. Mr. Scott Holladay, chief civil engineer for Shelby County, described new standards for road sign visibility in the *Manual on Uniform Traffic Control Devices*. Finally, Dr. Steven Jones, associate professor at UA, spoke about engineering practices in Europe.



FIGURE 12. Dr. Lou discusses sustainability at the ALSITE meeting

After lunch and a business meeting, attendees were treated to a tour of the newly renovated sections of UA's football stadium, Bryant-Denny.

The newly formed UA chapter of the ITE hosted the meeting. Between technical presentations, ALSITE's secretary-treasurer, Ms. Becky Malenke, presented the UA chapter officers and faculty advisor with their charter.

UTCA Research Presented at 54th Annual Transportation Conference

Two University of Alabama (UA) professors presented UTCA research in February at the 54th Annual Transportation Conference, hosted by Auburn University's (AU) College of Engineering.

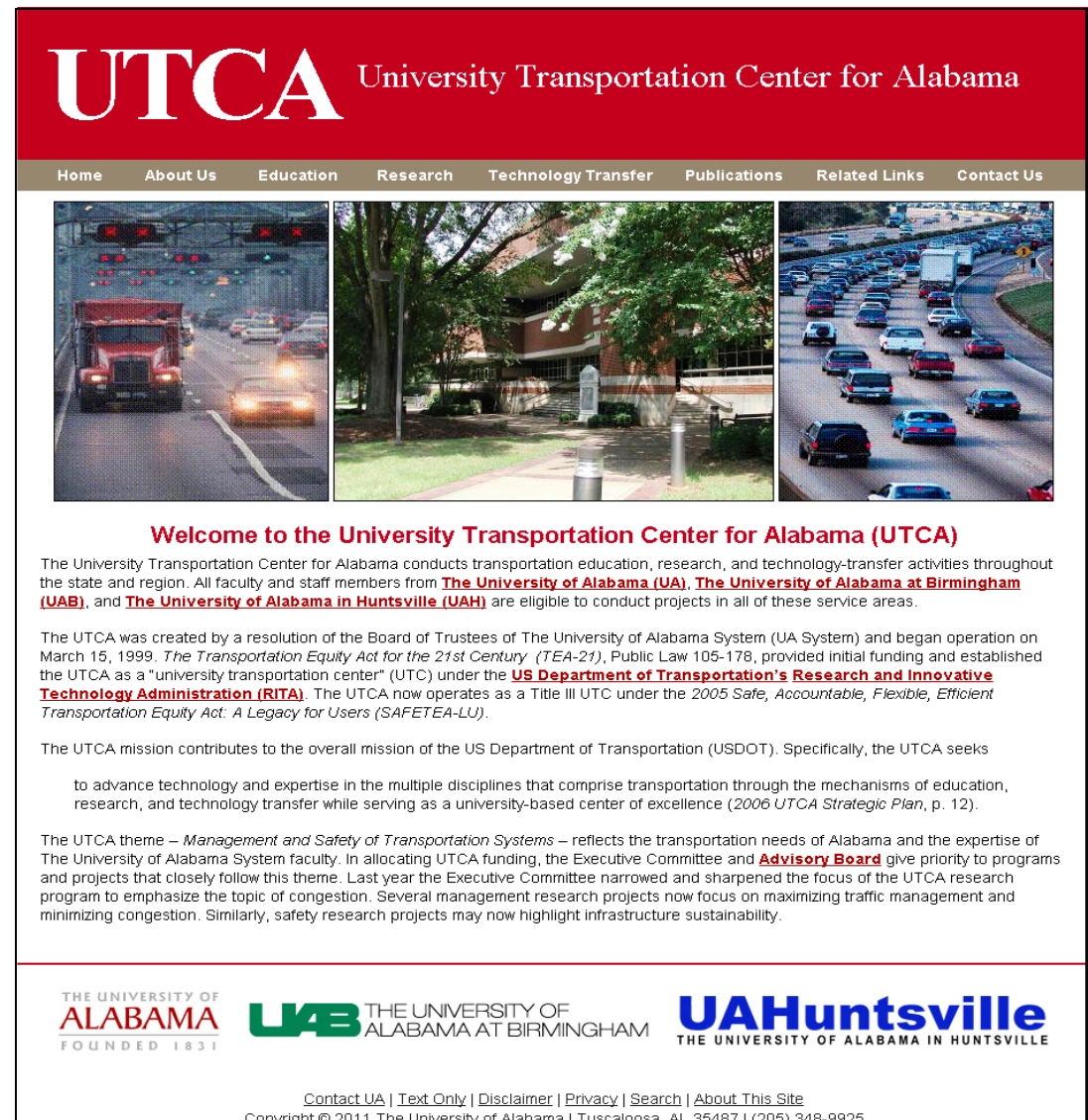
Dr. Steven Jones, associate professor of transportation systems engineering, talked about the **Scoping Study of Implementation of The Highway Safety Manual in Alabama (UTCA Project #10404)**. The *Highway Safety Manual* (HSM) is 950 pages of science-based safety policy and analysis that few departments of transportation have implemented. UTCA is working with UA's Center for Advanced Public Safety to investigate, test, and evaluate the overall HSM process to find an efficient way to implement it in Alabama.

Dr. Jay Lindly, professor of transportation systems engineering and director of UTCA, spoke about UTCA's **School Bus Seat Belt Pilot Project (UTCA Project #07407)**. Two years of careful data collection and analysis revealed that school buses are the safest form of transportation to school even without seat belts. Moreover, less than 62% of the students in the study used the seat belts. Using federal standards, UTCA researchers found that seat belt costs would likely exceed benefits by \$104 million to \$125 million.

Each year AU brings together transportation officials to share innovations in transportation planning, engineering design, and construction. The conference's technical presentations provide a forum for the exchange of ideas within the highway engineering and construction professions.

New UTCA Website

The University Transportation Center for Alabama has a new website. The new platform conforms to College standards, is easier to navigate and support, and is more robust. Please visit <http://utca.eng.ua.edu> to find copies of UTCA publications, descriptions of our education and tech-transfer programs, information for prospective researchers, links to related organizations, and more than 210 final reports.



UTCA University Transportation Center for Alabama

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Welcome to the University Transportation Center for Alabama (UTCA)

The University Transportation Center for Alabama conducts transportation education, research, and technology-transfer activities throughout the state and region. All faculty and staff members from [The University of Alabama \(UA\)](#), [The University of Alabama at Birmingham \(UAB\)](#), and [The University of Alabama in Huntsville \(UAH\)](#) are eligible to conduct projects in all of these service areas.

The UTCA was created by a resolution of the Board of Trustees of The University of Alabama System (UA System) and began operation on March 15, 1999. *The Transportation Equity Act for the 21st Century (TEA-21)*, Public Law 105-178, provided initial funding and established the UTCA as a "university transportation center" (UTC) under the [US Department of Transportation's Research and Innovative Technology Administration \(RITA\)](#). The UTCA now operates as a Title III UTC under the *2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)*.

The UTCA mission contributes to the overall mission of the US Department of Transportation (USDOT). Specifically, the UTCA seeks to advance technology and expertise in the multiple disciplines that comprise transportation through the mechanisms of education, research, and technology transfer while serving as a university-based center of excellence (*2006 UTCA Strategic Plan*, p. 12).

The UTCA theme – *Management and Safety of Transportation Systems* – reflects the transportation needs of Alabama and the expertise of The University of Alabama System faculty. In allocating UTCA funding, the Executive Committee and [Advisory Board](#) give priority to programs and projects that closely follow this theme. Last year the Executive Committee narrowed and sharpened the focus of the UTCA research program to emphasize the topic of congestion. Several management research projects now focus on maximizing traffic management and minimizing congestion. Similarly, safety research projects may now highlight infrastructure sustainability.

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Seminars and Short Courses

The UTCA faculty conducted a seminar and a short course in 2011 with 171 transportation professionals in attendance. The following descriptions illustrate the benefits practitioners are receiving from UTCA research projects and new transportation courses.

Turner, D.S., X. Sun, D. Tekel, and F.E. Amparano. *Seminar on Application of the Highway Safety Manual to Everyday Safety Issues Workshop*. Attended by members of the Southern District ITE, Lafayette, LA, April 13, 2011. (87 participants)

Turner, D.S. and S.L. Jones. *Additional Introductory Training for the Highway Safety Manual*. Attended by representatives from ALDOT and local departments of transportation, Montgomery, Alabama, October 11-14, 2011. (84 participants)

Presentations

During 2010 the UTCA faculty and students reported presenting 30 papers at 18 different meetings, including two international meetings. The wide range of meetings provided good exposure for the UTCA faculty and their research.

Amin, A., A.A. Garner, C.A. Franklin, P.R. Fine, and D. Stavrinos. *Assessing the Role of Sociability in Distracted Driving*. Poster presented at the 2011 University of Alabama at Birmingham Expo for Undergraduate Research, Birmingham, AL, April 2011. [Third place prize for student poster competition]

Amin, A., J.B. Chenoweth, P. Kapoor, B. McManus, S.C. Welburn, C.A. Franklin, P.R. Fine, and D. Stavrinos. *Cell Phone Application Use and Types among Young Distracted Drivers*. Poster presented at the 2011 University of Alabama at Birmingham Summer Expo for Undergraduate Research. Birmingham, AL, July 2011. [First place prize in student poster competition]

Cui, Q., D. Sharma, M. Farajian, J.K. Lindly, and R.J. Jilla. *Feasibility Study Guidelines for Public-Private Partnership Procurement on Highway Projects*. Presented at the 90th Annual Meeting of the Transportation Research Board, Washington, DC, January 2011.

Gurupackiam, S., D.S. Turner, and J.K. Lindly. *Investigation of Effects of Seat Belts on School Bus Capacity*. Presented at the 90th Annual Meeting of the Transportation Research Board, Washington, DC, January 2011.

Gurupackiam, S. and S.L. Jones. *Empirical Study of Lane Changing in Urban Streets under Varying Traffic Conditions*. Presented at the 6th International Symposium on Highway Capacity and Quality of Service, Stockholm, Sweden, June-July 2011.

Gurupackiam, S., S.L. Jones, and D. Fonseca. *Investigating Initialization Times, Repetitions, and MOE Variability in Simulation of Under Saturated and Saturated Traffic Signals*. Presented at the 6th International Symposium on Highway Capacity and Quality of Service, Stockholm, Sweden, June-July 2011.

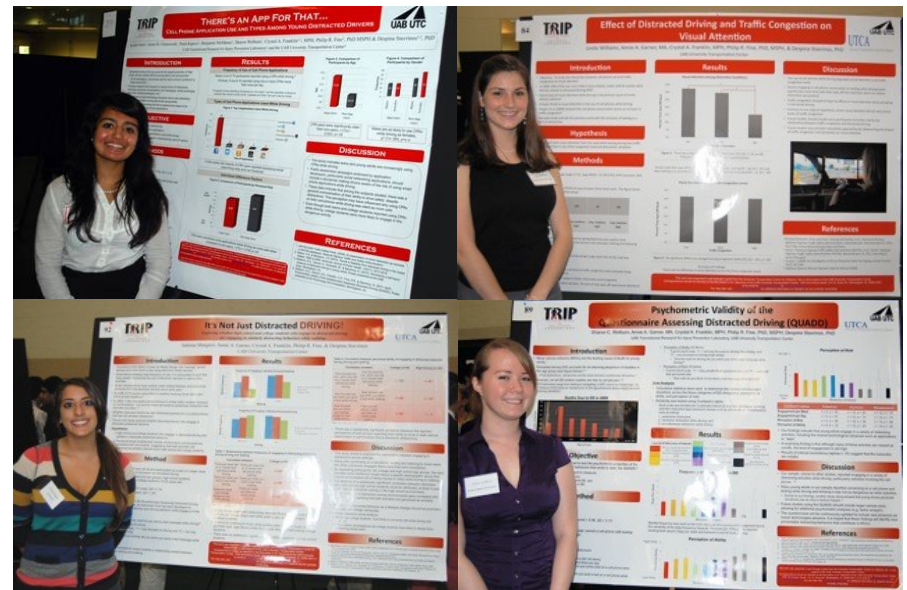


FIGURE 13. Several UAB students won awards for work that resulted from Dr. Despina Stavrinos' UTCA Project #10206, Impact of Distracted Driving on Congestion, at the UAB Summer Expo for Undergraduate Research. Clockwise, starting at the upper left, are Ms. Ayushi Amin, Ms. Leslie Williams, Ms. Sharon Welburn, and Ms. Sabrina Mangieri.

Hosch, I.E. *Design of Overhead VMS Structures for Fatigue Loads*. Presented at the UAB Civil Engineering Honors Seminar, Birmingham, AL, February 2011.

Jones, S.L. *Transportation Research at UA*. Attended by ALDOT officials, federal transportation officials, and transportation experts in academia at the ALDOT Peer Exchange, Birmingham, AL, May 10-12, 2011.

Jones, J.L., C.A. Franklin, P.R. Fine, and D. Stavrinos. *Can Individual Differences Predict Distracted Driving Performance in Young Adults?* Poster presented at the 27th Annual UAB Department of Medicine Trainee Research Symposium, Birmingham, AL, March 2011.

Jones, S.L., J.K. Lindly, and M.B. Wilkes. *Development of Pilot Car Training and Certification Program for the State of Alabama*. Presented at the 90th Annual Meeting of the Transportation Research Board, Washington, DC, January 2011.

Li, R. and B.B. Keskin. *A Multi-Objective Dynamic Location-Routing Problem for Patrol Coverage*. Presented at the Production and Operations Management Society Annual Conference, Reno, NV, April 2011.

Li, R. and B.B. Keskin. *A Multi-Objective Dynamic Location-Routing Problem for Patrol Coverage*. Presented at the Institute of Operations Research and Management Science Annual Conference, Charlotte, NC, November 2011.

Lindly, J.K. *School Bus Seat Belt Study*. Presented at the Fifty-Fourth Annual Transportation Conference, Montgomery, AL, February 2011.

Lindly, J.K. *The University Transportation Center for Alabama*. Attended by directors of the Capstone Engineering Society, Tuscaloosa, AL, October 7, 2011.

Mangieri, S., A.A. Garner, C.A. Franklin, P.R. Fine, and D. Stavrinos. *It's Not Just Distracted Driving!* Poster presented at the 2011 University of Alabama at Birmingham Expo for Undergraduate Research, Birmingham, AL, April 2011. [Third place prize for student poster competition]

McManus, B., A.A. Garner, C.A. Franklin, P.R. Fine, and D. Stavrinos. *Enhancing Productivity and Work Efficiency in a Research Laboratory*. Poster presented at the 2011 University of Alabama at Birmingham Expo for Undergraduate Research, Birmingham, AL, April 2011.

Parker, S., X. Qin, and A. Graettinger. *Development of a Statewide Crash Map: Merging and Mapping State and Non-State Crashes onto a Single Network*. Presented at the AASHTO GIS for Transportation Symposium, Hershey, PA, March 2011.

Parker, S., X. Qin, and A. Graettinger. *Wisconsin Department of Transportation: Statewide Crash Mapping and Analysis Project*.



FIGURE 14. A pilot car at work. As part of UTCA Project #10401, Dr. Steven Jones, Dr. Jay Lindly, and Ms. Mary Beth Wilkes are helping ALDOT to implement a pilot-car certification program. (Photo used with permission from Jim's Pilot Car Service)

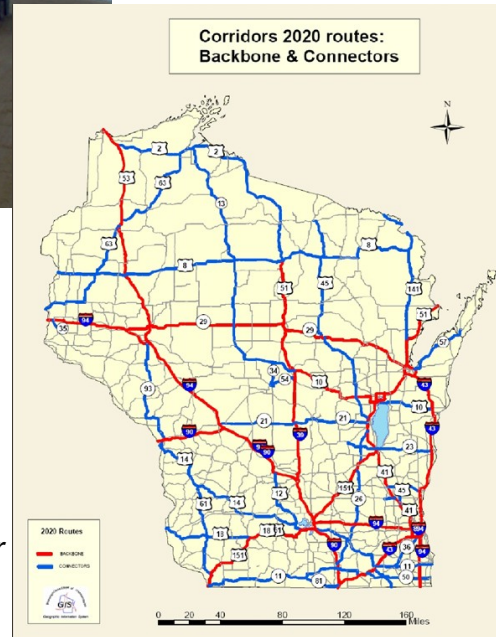


FIGURE 15. A map of Wisconsin's 2020 routes, which are part of UTCA Project #10403, Crash and Analysis Mapping

Presented at the 2011 Traffic Records Forum, Charlotte, NC, July-August 2011.

Sisiopiku, V. *Can Vehicle Mileage Travelled Fee Replace Traditional Gas Tax?* Presented at the 52nd Annual Transportation Research Forum, Long Beach, CA, March 2011.

Sisiopiku, V. *Establishing the Connection between Livable Community Assets and Public Health.* Presented at the 10th International Conference on Health Economics, Management, and Policy, Athens, Greece, June 2011.

Sisiopiku, V. *Evaluation of Lane-Reversal Plans for I-65 in Alabama.* Presented at the 3rd International Conference on Road Safety and Simulation, Indianapolis, IN, September 2011.

Sisiopiku, V. *Impact of Distracted Driving on Traffic Flow Parameters.* Presented at the 3rd International Conference on Road Safety and Simulation, Indianapolis, IN, September 2011.

Sisiopiku, V. *Modeling Incidents and Emergencies in the Birmingham Area Using VISTA.* Presented at the 90th Annual Meeting of the Transportation Research Board, Washington, DC, January 2011.

Stavrinos, D., A.A. Garner, C.A. Franklin, K.K. Ball, V. Sisiopiku, D. Ball, and P.R. Fine. *Impact of Distracted Driving on Traffic Flow Parameters.* Presented at the 3rd International Conference for Road Safety and Simulation, Indianapolis, IN, September 2011.

Stavrinos, D. and C.A. Franklin. *Racial Disparities in Distracted Driving.* Presented at the 2011 UAB Health Disparities Research Symposium, Birmingham, AL, April 2011.

Turner, D.S. *Implementation and Development of the Highway Safety Manual.* Presented at the 90th Annual Meeting of the Transportation Research Board, Washington, DC, January 2011.



FIGURE 16. Dr. Despina Stavrinos uses driving simulators to study distracted driving. Nine of these presentations and two of these papers resulted from her UTCA Project, #10206, Impact of Distracted Driving on Congestion.

Turner, D.S. *Improving Roadway Safety Programs through University-Agency Partnerships.* Sponsored by the Transportation Research Board and the Research and Innovative Technology Administration of USDOT, Washington, DC, November 2011.

Turner, D.S. *Issues for CMF Jurisdictional/Domestic Transferability.* Presented at the 90th International Workshop on Transferability of CMFs, 2011 Annual Meeting of the Transportation Research Board, Washington, DC, January 2011.

Welburn, S.C., A.A. Garner, C.A. Franklin, P.R. Fine, and D. Stavrinos. *Psychometric Validity of Questionnaire of Assessing Distracted Driving (QUADD).* Poster presented at the 2011 University of Alabama at Birmingham Expo for Undergraduate Research, Birmingham, AL, April 2011. [First place prize for student poster competition]

Williams, L., A.A. Garner, C.A. Franklin, P.R. Fine, and D. Stavrinos. *Effect of Distracted Driving on Visual Attention.* Poster presented at the 2011 University of Alabama at Birmingham Expo for Undergraduate Research, Birmingham, AL, April 2011. [Third place prize for student poster competition]

Publications

Faculty members report that eleven papers and one book chapter were published in refereed journals and conference proceedings in 2011. These papers were based on the results of UTCA research projects. Specific details of each publication are provided in this section.

Ashour, M. and H. Ardalan. *Analysis of Pile Stabilized Slopes Based on Soil–Pile Interaction*. Journal of Computers and Geotechnics, Vol. 39, pp. 85-97, 2011.

Deganis, L.E. and Q.H. Zuo. *Crack-Mechanics Based Brittle Damage Model Including Nonlinear Equation of State and Porosity Growth*. Journal of Applied Physics, Vol. 109, no. 073504, pp. 1–11, 2011.

Garner, A.A., P.R. Fine, C.A. Franklin, R.W. Sattin, and D. Stavrinou. *Distracted Driving among Adolescents: Challenges and Opportunities*. Injury Prevention, Vol. 17, no. 4, p. 285, 2011.

Gurupackiam, S. and S.L. Jones. *Empirical Study of Lane Changing in Urban Streets under Varying Traffic Conditions*. Procedia Social and Behavioral Sciences, Vol. 16, pp. 259–269, 2011.

Gurupackiam, S., S.L. Jones, and D.J. Fonseca. *Investigating Initialization Times, Repetitions, and MOE Variability in Simulation of Under Saturated and Saturated Traffic Signals*. Procedia Social and Behavioral Sciences, Vol. 16, pp. 470–480, 2011.

Lou, Y., G. Mehta, and D. Turner. *Factors Influencing Students' Usage of School Bus Seat Belts: An Empirical Analysis of the Alabama Pilot Project*. Accident Analysis and Prevention, Vol. 43, no. 9, pp. 1644–1651, 2011.

Sisiopiku, V. *Active Traffic Management as a Tool for Addressing Traffic Congestion*. Book chapter in Intelligent Transportation Systems, edited by Ahmed Abdel-Rahim, 2011.

Sisiopiku, V.P. and A. Sullivan. *Impacts of Signal System Timings on Rain Related Congestion*. International Journal of Engineering and Industries, Vol. 2, no. 1, pp. 1–12, 2011.

Sisiopiku, V.P., and A.M. Abro. *Establishing the Connection between Livable Community Assets and Public Health*. Proceedings of the 10th International Conference on Health Economics, Management, and Policy, Athens, Greece, 2011.

Sisiopiku, V.P. and O. Cavusoglu. *Evaluating Designated Truck Lane Strategies for an Urban Freeway Corridor*. Journal of Transportation of the Institute of Transportation Engineers, Vol. 2, no. 1, pp. 57–70, 2011.

Sisiopiku, V.P., K. Mouskos, and C. Barrett. *Evaluation of Lane-Reversal Plans for I-65 in Alabama*. Proceedings of the 3rd International Conference on Road Safety and Simulation, 2011.

Sisiopiku, V.P. and C. Zhong. *Can Vehicle Mileage Travelled Fee Replace Traditional Gas Tax?* Proceedings of the 52nd Annual Transportation Research Forum, Long Beach, CA, 2011.



FIGURE 17. Lou, et al. published a study of school bus seat belt use based on UTCA Project #07407, School Bus Seat Belt Study. This is a camera shot from one of the school buses used.

UAB Hosts 6th Annual Student Awards Luncheon

Students from the three campuses of The University of Alabama System are engaged in a variety of transportation-related research activities. To increase the opportunities they have to present their research, the University Transportation Center for Alabama (UTCA) sponsored **project #11306, Student Funding to Attend TRB Conference 2011**. Dr. Mike Anderson of The University of Alabama in Huntsville, Dr. Virginia Sisiopiku of The University of Alabama at Birmingham (UAB), and Dr. Yingyan Lou of The University of Alabama (UA) worked together to provide a forum in which students could give research presentations. Students were invited to present abstracts of their research to a panel of representatives from each campus, and then winners were selected.

The students who presented the best abstracts were invited to present technical papers at the 6th Annual Student Awards Luncheon on December 2, 2011. This awards luncheon, held at The University of Alabama at Birmingham, was organized and hosted by the Institute of Transportation Engineers (ITE) Student Chapter at UAB. The presenters were Md Imran Shah (UAB), Mohammad Miranilaghi (UA), and Mary Catherine Dondapati (UAH). Other students also received recognition at the luncheon for a job well done: Abdul Abro (UAB), Alexandra Dukeman (UA), Frances Green (UA), Timothy Hale (UAB), Tahmina Khan (UAH), Jaehoon Kim (UAH), Gaurav Mehta (UA), Lane Morrison (UA), Cristina Poleacovschi (UAH), Shiegeyuki Ueno (UAH), and Cheng Zhong (UAB).

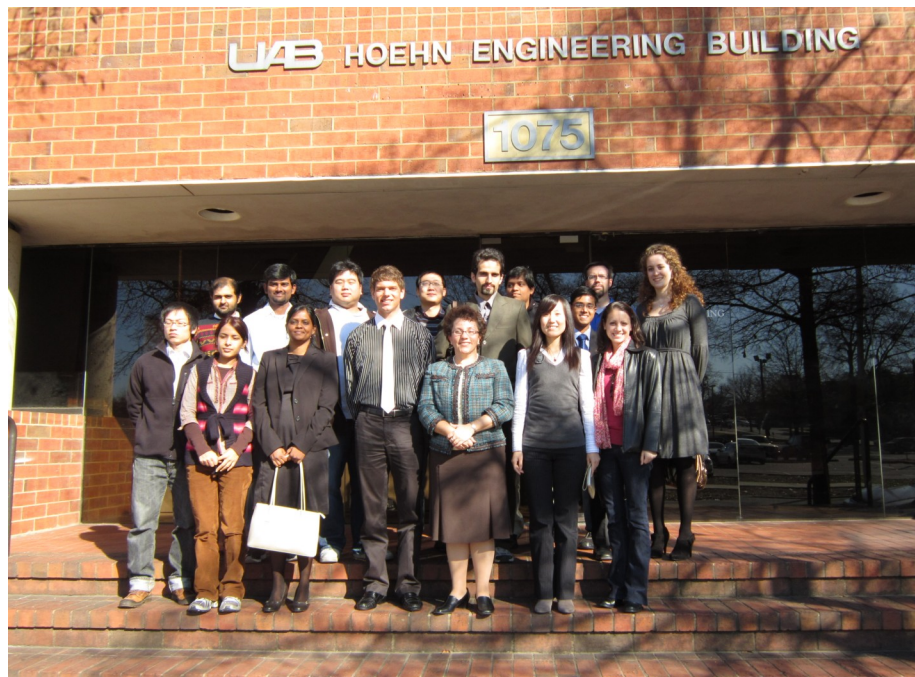


FIGURE 18. Dr. Sisiopiku, Dr. Lou, and the award recipients together outside UAB's Hoehn Engineering Building

All the students selected as winners received funding to attend the 91st Annual Meeting of the Transportation Research Board (TRB) in Washington, DC, in January 2012.

The UTCA will provide a multidisciplinary program of course work and experiential learning that reinforces the transportation theme of the center (2006 Strategic Plan, p. 17).

UA Student's Poster Earns First Place

Ms. Rong (Shirley) Li, a third-year operations management doctoral student at The University of Alabama (UA), earned first place at the Institute for Operations Research and the Management Sciences (INFORMS) Regional Transportation, Supply Chain, and Logistics Management Workshop held at Mississippi State University for her poster, "Analysis of an Integrated Maximum Covering and Patrol Routing Problem." Li's poster discussed methods for determining the patrol routes of state troopers for maximum coverage of highway spots with high frequencies of crashes (hot spots).

"This is important as better state-trooper coverage is believed to lead to fewer accidents, lower economic impact due to crashes, and better road safety for everybody," Li's faculty advisor, Dr. Burcu Keskin, said.

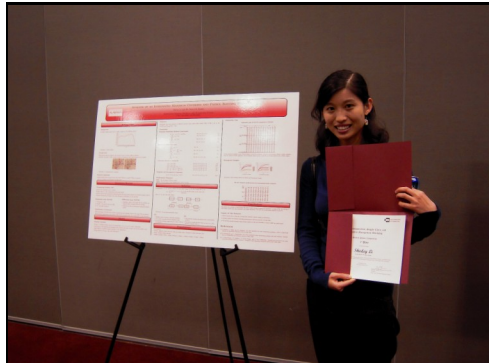


FIGURE 19. Ms. Rong Li with her poster and award

Using data from the state of Alabama, Li provided recommendations for decision makers concerning the number of state troopers and the critical levels of highway coverage that addressed the dynamic changes in routes. The analysis can be used to reallocate resources in the event of a potential budget cut or increase.

The poster competition and workshop provides an opportunity for faculty and students to present ongoing transportation, supply chain, and logistics management-related research and to identify interdisciplinary collaboration opportunities among universities and research centers in the Deep South. Students who present abstracts of their work are invited to participate in the student poster competition. Student participants give a five-minute presentation to the panel regarding their poster and answer related questions.

Li's research was supported through **UTCA Project #09104, *Optimal Traffic Resource Allocation and Management***.

Part of this article is quoted verbatim from a UA press release. The complete press release can be viewed at <http://uanews.ua.edu/2011/04/ua-grad-students-poster-earns-first-place-award/>.

Moses Tefe Named NSF Fellow, UTCA Student of the Year

Mr. Moses K. Tefe—a doctoral student in the Department of Civil, Construction, and Environmental Engineering at The University of Alabama (UA)—received two honors in November.

First, Mr. Tefe was named a National Science Foundation fellow as part of UA's GK-12 Sustainable Energy Systems project. As part of his fellowship, Mr. Tefe serves as a mentor and teaches second graders in Alabama's impoverished Black Belt math and science every week. He also developed a science and math teaching module that will be used in a west Alabama school district.

Second, The UTCA recognized Mr. Tefe as its 2011 Student of the Year. The formal presentation of the Student of the Year award occurred in Washington, DC, during the Transportation Research Board's 91st Annual Meeting. Accompanying Mr. Tefe were Dr. Daniel S. Turner, UTCA's founding executive director; Dr. Jay K. Lindly, UTCA's current executive director; and Dr. Steven L. Jones, Mr. Tefe's advisor.



FIGURE 20. Mr. Moses Tefe, NSF fellow and UTCA Student of the Year

Mr. Tefe enrolled in the Department of Civil, Construction, and Environmental Engineering at UA in 2007. He has worked on several UTCA research projects, including **#07403, *Intercity Bus Service Study 2007***; **#07407, *Alabama School Bus Seat Belt Pilot Project***; and **#08401, *Driver Reaction at Railroad-Highway Grade Crossings***. Currently Mr. Tefe is a teaching assistant, instructing students in traffic engineering, geometric design software, and engineering surveying.

Mr. Tefe came to UA with extensive engineering experience. He worked as a traffic/transportation engineer for Associated Consultants, a Ghanaian firm that operates multinationally, for thirteen years. He received a masters degree from UNESCO-IHE, in the Netherlands, and a bachelors degree from the Kwame Nkrumah University of Science and Technology, in Ghana.

Dr. Hardin Named Dean, Fellow

Dr. Michael Hardin, associate director for the University Transportation Center for Alabama (UTCA), recently received a promotion and a prestigious honor.

In April, Dr. Hardin was elected a fellow of the American Statistical Association (ASA). The designation of fellow is reserved for professionals in statistics who make outstanding contributions to the field. The fellow designation is limited to no more than one-third of 1 percent of the ASA membership, which now is about 18,000 in the United States, Canada, and overseas.

In June, Dr. Hardin was named the eighth dean of the Culverhouse College of Commerce and Business Administration at The University of Alabama. As senior associate dean for the previous three years, Hardin had been responsible for the day-to-day operation of the college, including academic programs, enrollment management, and financial and administrative matters. He also guided the college through a five-year window of reaccreditation by the AACSB (The Association to Advance Collegiate Schools of Business), which began in 2008.

Dr. Hardin has authored or co-authored more than 85 papers and several books dealing with database design and decision support systems. He often serves as a consultant to the healthcare industry, and he has been a consultant with the SAS Institute in the areas of data mining and time-series analysis since 1999. Hardin was the first SAS Quality Partner in the state of Alabama.

Prior to joining UTCA as an associate director, Dr. Hardin served as the principal investigator for **UTCA Project #02115, Crash Safety - Data Mining Approach**, which is available on UTCA's website.



The University of Alabama - Faculty Resource Center - Imaging Services

Dr. Turner Named National Associate

Dr. Daniel Turner, founder and former executive director of the University Transportation Center for Alabama (UTCA), was named a member of the 2011 class of National Associates of the National Academies. The National Associates program gives lifetime recognition to individuals who have made extraordinary contributions to the National Research Council (NRC) through service on committees and panels of the NRC and the Institute of Medicine without compensation.

Dr. Turner's involvement with the NRC has been extensive. He chairs the Transportation Research Board's (TRB) Operations and Preservation Group and sits on TRB's Technical Activities Council, Committee on Operational Effects of Geometrics, and Highway Safety Manual Task Force. He is also a former member of the TRB's Executive Committee and the TRB-AASHTO-FHWA Coordinating Committee.

In addition, Dr. Turner has served as president of the American Society of Civil Engineers, president and executive committee member of the Council of University Transportation Centers, chair of the Legislative and Policy Committee of the Institute of Transportation Engineers, and member of the Alabama Board of Licensure for Professional Engineers and Land Surveyors.

A graduate of UA, Dr. Turner has completed 125 research and training projects with a total budget in excess of \$31 million dollars, including **UTCA Project #07407, Pilot Study: School Bus Seat Belts**, which received coverage in national media. He has written 320 books, articles, and reports; delivered 600 presentations at technical and professional meetings; and developed or taught 85 short courses. Dr. Turner is also the former director of the University Homeland Security Institute for Alabama.



Part of this article is quoted verbatim from UA press releases. The complete press releases can be viewed at <http://uanews.ua.edu>.

UAB ITE Takes Third Place at 2011 SDITE Traffic Bowl

The Institute of Traffic Engineers (ITE) Student Chapter at the University of Alabama at Birmingham (UAB) enjoyed its best finish yet in the William Temple Scholarship Challenge Traffic Bowl, placing 3rd among 26 teams.

Under the supervision of Dr. Virginia Sisiopiku, UAB's team of Ozge Cavusoglu, Cheng Zhong, and Bharath Kallem first defeated a team from Auburn University in December for the privilege to represent the Alabama Section ITE at this year's Traffic Bowl.



FIGURE 22. Members of UAB's Traffic Bowl team receive a scholarship from the SDITE for their 3rd-place finish. In the front (left to right): Cheng Zhong, Dr. Virginia Sisiopiku (faculty advisor), Ozge Cavusoglu, and Bharath Kallem. In the back (L to R): SDITE President Tim White; Forrest Temple, grandson of William H. Temple, after whom the competition is named; SDITE Secretary-Treasurer Martin Bretherton; and ITE International President Robert C. Wunderlich.

the SDITE for their strong finish.

The Traffic Bowl uses Jeopardy-style competition. Teams of three students answer questions based on transportation and traffic-related topics. The Southern District ITE has held the Traffic Bowl every year since 2005. The intent of the scholarship challenge competition is to bring together some of the leading ITE student members from Southern District for team competitions at the Annual Meeting of the Southern District.

UA ITE Student Chapter Completes Successful First Year

The chapter of the Institute of Transportation Engineers (ITE) at The University of Alabama (UA) had a busy first year promoting camaraderie and professional development among aspiring traffic engineers on campus. This article presents a few of ITE's highlights from 2011.

In March, the chapter hosted the Spring 2011 ALSITE meeting, which featured technical presentations, a luncheon, a business meeting, and a tour of the football stadium. During the meeting, ALSITE presented the student officers with the chapter's charter. For more information, see the ALSITE article on page 12.

In April, the chapter attended a meeting of the Regional Planning Commission of Greater Birmingham and visited the Traffic Management Center in Birmingham's City Hall. Members got to see planning and operations activities from behind the scenes and networked with transportation professionals.

In October, ITE engaged prospective engineers at UA's annual E-Day, an open house for high-school students. Members distributed traffic-engineering literature and showed the high-school students traffic simulations on the CORSIM software. The chapter also entered the Canformation competition with a six-foot replica of a traffic light made of canned goods and boxes of ramen noodles. Afterward, the food was donated to the Beat Auburn Beat Hunger food drive.



FIGURE 23. UA ITE members pose with their traffic-themed Canformation entry

UA's chapter of ITE was led by Frances Green (president), Daniel Dye (vice president), Laura Beth Pockstaller (treasurer), and Morgan Calvano (secretary). Dr. Steven Jones served as the chapter's faculty advisor.

2011 Advanced Transportation Institute

Since its inception in 1999, the UTCA has been committed to recruiting minority students to careers in transportation engineering. For the tenth consecutive year, UTCA and the Alabama Department of Transportation (ALDOT) cosponsored a summer program for rising high-school juniors and seniors from west-central Alabama. **UTCA Project #11101, Advanced Transportation Institute 2011 (ATI-11)**, hosted 17 students for three days in July.

Every year, a highlight for the students is a series of design competitions. This year ALDOT's lead surveyor arranged a contest where students started at a known elevation, surveyed across a field and back, and determined the elevation of a given point. They learned how to set up and use the surveying instrument, how to take surveying readings through the instrument, and how to calculate the elevation.



Figure 24. Students design bridges on West Point Bridge Designer software

The Institute curriculum featured presentations by ALDOT professionals and university faculty. Activities and presentations were designed to prepare students for university life and transportation careers. Students learned about university-admission procedures and transportation-career opportunities. Other presentations focused on transportation planning, design, construction, maintenance, and safety.

The students also toured a quarry. The quarry operators showed how they get the rock out of the ground, move it where they need it, crush it, test it, and load it for shipment. They explained that the strength and size of the rock they provide depends on whether the client needs it for pavement, foundations, commercial manufacturing, and so on.

ATI has had success in encouraging students from underrepresented groups to pursue transportation careers. Every year surveys have shown that the participants are more likely to consider a career in transportation after ATI than before, and several ATI participants have received engineering degrees from UA.



Figure 25. ATI participants tour the Martin Marietta Quarry in Vance, Alabama

UAH Hosts Summer TEAM Program

In the past 11 years, over 400 middle-school students from the Huntsville area have enjoyed summer outreach programs organized by Dr. Kate Leonard from The University of Alabama in Huntsville (UAH). By providing fun learning experiences in an academic setting, Dr. Leonard hopes to encourage students from under-represented groups to consider careers in transportation engineering. **UTCA Project #11301, The Transportation Engineering Advancement and Mentoring (TEAM) Program**, continued this tradition by bringing faculty members from UAH and professionals from the Society of Women Engineers together with teenagers to develop students who can examine and evaluate evidence and find answers to questions.

This year's TEAM Program began in February during Engineers' Week. Mentors (students and professionals) visited classes, gave presentations about transportation engineering, and introduced a design/build competition. Student teams took the next couple of months to design Popsicle-stick bridges and solar

cars. On April 8, they brought their creations to UAH for a tournament. Tanner High School students won both competitions and their teacher, Mrs. Lydia Lagrone, was honored for her mentorship role.

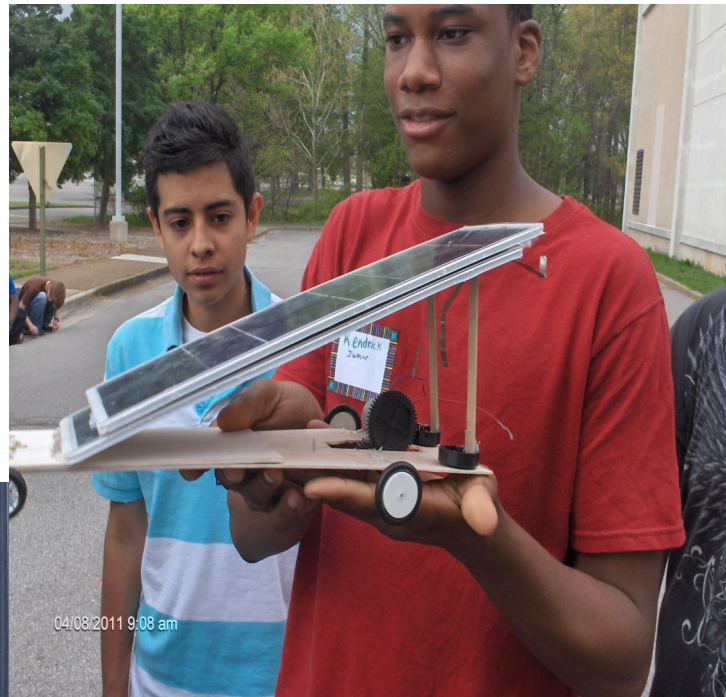


Figure 26. A TEAM participant shows his entry to the solar car race

Students from participating schools attended a week-long program held on the UAH campus in June, where they learned about the role of transportation planning, management, safety, and design in modern society, with a focus on alternative-energy technologies. They also got to apply what they learned in the classroom: they built geodesic domes, which make strong

structures with few materials; robotic cars to track speed and acceleration; and water rockets to demonstrate principles of rocket design.

The evidence suggests that the TEAM Program has had a positive impact. The first TEAM graduates have enrolled in engineering programs, including at UAH, and just under 90% of respondents to a recent survey of alumni from the 2003-2005 programs said they plan to attend college, with a majority in engineering.



Intercampus Interactive Television System



Transportation faculty members have instituted a rotating two-year program of courses shared between the three UTCA campuses. Each campus teaches its required undergraduate classes, and each semester there are one or two other transportation courses offered via IITS (Intercampus Interactive Television System). This program ensures that juniors and seniors can be exposed to three or four transportation electives not available at their home campuses and that graduate students have a continuous choice of courses in their specialty areas.

TABLE 4. Multi-Campus Courses since 2007

SP 07	Sisiopiku	UAB	Non-Motorized Transp. Design & Planning
FA 07	Sisiopiku	UAB	Traffic Flow Theory
FA 07	Anderson	UAH	Urban Transportation Planning
SP 08	Turner	UA	Transportation Safety & Security
FA 08	Lindly	UA	Pavement Rehabilitation
FA 08	Anderson	UAH	Urban Transportation Planning
FA 08	Sisiopiku	UAB	Intelligent Transportation Systems
SP 09	Turner	UA	Geometric Design of Roadways
SP 09	Anderson	UAH	Traffic Engineering Operations & Design
SP 09	Sisiopiku	UAB	Non-Motorized Transp. Design & Planning
FA 09	Lindly	UA	Pavement Design & Construction
FA 09	Anderson	UAH	Urban Transportation Planning
FA 09	Sisiopiku	UAB	Traffic Flow Theory
SP10	Anderson	UAH	Simulation Modeling
SP10	Jones	UA	Signal Timing
SP10	Lou	UA	Transportation System Analysis
FA10	Anderson	UAH	Urban Transportation Planning
FA10	Lindly	UA	Pavement Rehabilitation
FA10	Sisiopiku	UAB	Intelligent Transportation Systems
FA11	Lou	UA	Transportation System Analysis
FA11	Sisiopiku	UAB	Traffic Flow Theory

Performance Indicators for University Transportation Centers

The following Performance Indicators will be reported to RITA as part of the reporting requirements that all UTCs must perform. Where Baseline Measures are cited, they come from UTCA's Title III Center *Strategic Plan* accepted by RITA on February 15, 2007.

Research Selection

1. Number of transportation research projects selected for funding using your UTC grant funding (Federal and/or match). 10
 - 1a. Number of those projects that you consider to be: basic research 0, advanced research 1, and applied research 10. Projects may be included in more than one category if applicable.
2. Total budgeted costs for the projects reported in #1 above. \$589,821.00

Research Performance

3. Number of reports issued that resulted from transportation research projects funded by the UTC grant. 2
4. Number of transportation research papers presented at academic/professional meetings that resulted from projects funded by the UTC grant. 30

Education

5. Cumulative number of transportation-related courses that have been added since the beginning of the grant to the number of courses you reported in Baseline Measure 1 in your UTC Strategic Plan. Include courses added to the university course catalog whether or not they were conducted during a particular grant year.
Undergraduate: 0 Graduate: 0

6. Number of students participating in transportation research projects. Count individual students (one student participating in two research projects counts as one student).
Undergraduate: 21 Graduate: 35

Human Resources

7. Cumulative number of transportation-related advanced degree programs that have been added since the beginning of the grant to the number of degree programs you reported in Baseline Measure 3 in your UTC Strategic Plan.
Undergraduate: 0 Graduate: 0
8. Number of students enrolled in transportation-related advanced degree programs (the baseline programs and any added since the beginning of the grant).
Master's Level: 15 Doctoral Level: 12
9. Number of students who received degrees through the baseline and any added transportation-related advanced degree programs.
Master's Level: 17 Doctoral Level: 2

Technology Transfer

10. Number of transportation seminars, symposia, distance learning, classes, etc. conducted by your UTC for transportation professionals. 2
11. Number of transportation professionals participating in those events. 171