

UTCA

University Transportation Center for Alabama
The University of Alabama, The University of Alabama in Birmingham,
and The University of Alabama at Huntsville

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UTCA Overview

UTCA was created in 1998 and became a "University Transportation Center of the USDOT in 1999. The Center conducts transportation education, research, and tech transfer activities on UA System campuses (UA, UAB and UAH). All faculty members on the three campuses are eligible to conduct projects.

Mission Statement – The UTCA mission reflects the mission statement of the USDOT:

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.

Theme - The theme, "Management and Safety of Transportation Systems," reflects the transportation needs of Alabama and the region, and the capabilities of UA System faculty members. The majority of UTCA's funds are spent on projects that support the theme.

3rd Annual UTCA Research Symposium and Career Fair

The Annual Research Symposium is even better this year, with the addition of a career fair. It will be held November 13 at the Ferguson Center on the UA campus in Tuscaloosa. Full registration is \$25 and student registration is \$10.

Questions about registration or other Symposium issues may be addressed to Steven Jones at 205.348.5859 or sjones@eng.ua.edu, or to Joy Curry at jcurry@eng.ua.edu or 205.348.9925 or fax 205.348.6862.

Time	Speaker	Presentation
8:00 – 8:15	Registration	
8:15 – 8:30	Welcome	Steven Jones
Safety Session		
8:30 – 9:00	Kerri Keith	Integration of GIS into the CARE software
9:00 – 9:30	Jay Lindly	Safety Impacts of Rumble Stripes
9:30 – 10:15	Break	
Advanced Technology Session		
9:45 – 9:15	Mike Anderson	Design and Application of an Internet-based Travel Survey
10:00 – 10:30	Virginia Sisiopiku	Transit Ops; Impacts of Signal Priority Implementation
10:30 – 10:45	Break	
Policy Session		
10:45 – 11:15	Qingbin Cui	Long-Term Warranties on Highway Projects
11:15 – 11:45	Johnnie Waid	Options for Financing Alabama Highways
Luncheon - Keynote Speaker to be Announced		
Concurrent Afternoon Sessions		
1:00 – 2:00	UTCA Students	Student presentations on their research
2:00 – 4:30	Job Fair	Job opportunities
1:00 – 4:30	Virginia Sisiopiku	Dynamic Traffic Assignment Seminar

Symposium attendees are eligible for 4 professional development hours (PDHs), with 3 additional PDHs for Seminar attendees.

Education Program Builds Professional Capacity

The UTCA education program has become robust. Initially, all three campuses created new transportation degrees or degree options. A rotating two-year program of transportation courses was adopted, taught through the Intercampus Interactive Telecommunication System (IITS). Since 2002, two or more courses per semester have been available to provide students access to faculty expertise available on the other campuses.

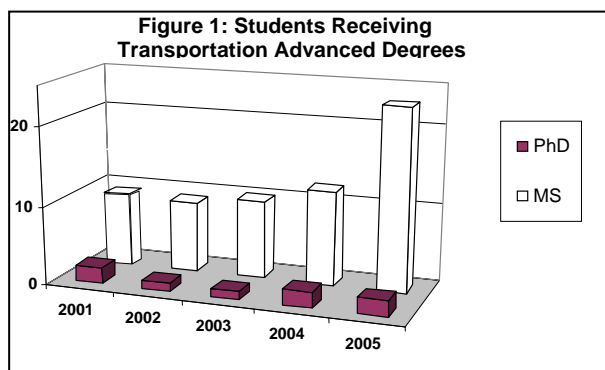
Table 1: Sample IITS* rotating courses

Faculty	Course
Jones (UAB, UA), Anderson (UAH)	Transportation Planning
Anderson, Jones	Traffic Engineering
Sisiopiku (UAB)	ITS
Turner	Traffic Safety
Turner	Geometric Design
Haynes (UA)	Airport Plan/design
Sisiopiku	Trans Simulation
Lindly [UA]	Pavement Rehab

These actions led to a sharp increase in both the undergraduate and graduate transportation programs. Table 2 and Figure 2 document the rapid growth of the transportation education program since the creation of UTCA. This type of growth can provide tomorrow's transportation leaders to the state and nation.

Table 2: Sample education metrics

Measure of Progress	1999	2005	Increase
Transportation courses	24	66	275%
Students in trans courses	206	572	278%
Students on transportation research projects	28	49	175%
MS and PhD degrees	4	25	625%



UTCA Research Program

Project Selection Process – The Advisory Board and UTCA managers prepare an *Annual Research Plan* to address important transportation issues of the State and the region. Faculty members submit proposals, which are screened by out-of-state peer experts to guide UTCA in selection of the best projects, proposed by the best faculty teams.

Research Participation – Faculty have been exceptionally responsive to UTCA, as illustrated by Table 2. An abundance of expertise has been focused on transportation research.

Table 2: Faculty participation in research

382	Proposals received by UTCA 1999-2005
167	Different PIs/Co-PIs who wrote proposals
64	Interdisciplinary proposals
40	Multi-campus proposals

The strong point has been development of multi-campus, interdisciplinary teams capable of tackling complex challenges. The principle recipients of UTCA research have been ALDOT and other transportation organizations.

Research Strengths – Several topical strengths have emerged, including traffic safety studies, traffic simulation and optimization, transportation planning, management of transportation data or processes, and bridge research.

Shift in Research Program – As a result of a review by a group of AAAS experts and the provisions of SAFTEA-LU, the UTCA Executive Committee has narrowed the focus of the Center for 2007 projects.

UTCA will begin conducting research to support the national surface transportation research program. Specifically, the Center will concentrate on projects listed in FHWA and FTA research plans on the topics of *traffic flow, congestion mitigation, and congestion chokepoints*. This supports immediate needs of both the nation and Alabama.

Proposals submitted under the new criteria will be reviewed by federal research program managers to ensure that the projects will make significant contributions. Two projects have already been initiated: 06121 by Steven Jones to examine traffic signal operation on oversaturated arterials, and 06122 by Jay Lindy to co-sponsor three FTA workshops to identify national transit research needs.

UTCA Research Assistants Participate in International Service Project

UTCA Undergraduate Research Assistants Marlo Wright and Justina Quinney were among 17 students from the University of Alabama who visited Iquitos, Peru with the UA *Engineering Students without Borders* (ESWB) Student Chapter. The Faculty Advisors, Drs. Philip and Pauline Johnson, accompanied the students on the May, 2006 service project.

During the two-week stay, students learned much about transportation in other countries. Travel was possible only by boat or air, and it was very time consuming. They had taken for granted the ease and convenience of their travel back in Alabama. And that was not all they had taken for granted. Read on for details of this life changing trip.

Prior to the trip, the ESWB group planned two engineering service projects. The first project was to construct a tower to increase bird watching and ecotourism. This will help bring attention and awareness to the reserve to help undeveloped villages along the Amazon River. The second project was to improve drinking water and waste systems in these communities.

The 2006 trip was conducted to gather input from local leaders, collect engineering design data, and identify sites for construction. The students are doing the design work during the 2006-07 academic year, and the construction will occur during a second ESWB trip in late spring of 2007.

Iquitos is located in northeast Peru in the middle of the rainforest. So after long flights, the group arrived in Iquitos and was welcomed by students from the Universidad Particular de Iquitos. The Alabama group's lives were thrown upside down during the two-week stay. They learned much about transportation in other countries. With travel only by foot, boat or air, they found it was time consuming. In other words, they realized that they had taken for granted their day-to-day transportation back in Alabama, which was convenience based and easy to use.

That was not the only thing they learned about other cultures, as they coped with new life styles – no cell phones, constant mosquito bites, strange food, and wooden boards for beds. But there were also rich rewards – smiles on the faces of children with whom they played, and on the faces of Peruvian university students with whom they worked.



Figure 3: Performing a "perk" test

These experiences gave the students respect for Peruvian culture and new personal strengths. Even though the visits to the villages only lasted a few days, relationships were made quickly and more than a few tears were shed during the farewell. Relationships were also built with students from Universidad Particular de Iquitos, which gave endorsement and support to the ESWB team, and helped arrange two ESWB appearances on Peruvian television to spread the news of the projects.

This was much more than an academic exercise; it was a once-in-a-lifetime character building opportunity. Personal growth occurred when complications arose and individuals found ways to meet challenges, even when the circumstances were difficult. In dealing with these challenges, team members applied their problem solving skills in a new context, and obtained valuable experiences that will pay off later in their professional careers.



Figure 4: Typical village along the Amazon River

At the end of a great deal of dedicated work, the team returned to the United States with valuable engineering data and other information for both projects. A bird watching tower in the Allpahuayo Mishana Reserve, improved septic systems for the visited villages and new relations with Universidad Particular de Iquitos will result from this 2006 trip to Peru. But even more has already occurred. All members of the visit team found that their perspectives of life had deeply changed. And these 17 students found a lifelong commitment to using their education and skills to help others.

2006 UTCA Projects

UTCA awards projects annually to faculty members on all three UA System campuses, based upon a two-stage, competitive review of pre-proposals and proposals. Projects are conducted from an Annual Research plan prepared by the Advisory Board. The proposals are reviewed by outside experts, the Advisory Board, and the Executive committee prior to selection for funding. In addition, external agencies also fund UTCA projects. Only brief descriptions are shown below. For brevity, the names of Co-PIs and other details were not included. Readers may find more complete information about individual projects on the UTCA web site (<http://utca.eng.ua.edu/>) at the projects page.

Bridge Projects

Project 06210, "Deck Forms for Bridge Construction Safety," Dr James Davidson (UAB). This project will improve bridge design efficiency and construction safety by developing a methodology that considers the contribution of concrete deck forms to stability during the construction of steel girder bridges.

Project 06217, "Strengthening Steel Bridge Girders Using CFRP," Dr Talat Abu-Amra, (UAB). This study is investigating strengthening steel bridges with CFRP (Carbon Fiber-Reinforced Polymer) plates on the girders. This could be cost effective for steel bridge rehabilitation and for addressing hurricane loads.

Project 06303 "Multimedia Resource for LRFD Concrete Bridge Design," Dr. Houssam Toutanji (UAH). This is an extension of previous bridge resource modules (self-training CD-ROMS), summarizing the Load and Resistance Design technique. The target audience is ALDOT and Alabama consulting bridge engineers.

Project 06401 "Bridge Health Monitoring Metrics," Dr. Jim Richardson (UA). This project is developing a family of deterioration prediction models for the ALDOT bridge management system. It is based upon application of modern analytical procedures using historical ALDOT bridge inspection data.

Project 06402 "Alabama Bridge Information Management Plus," Dr. Dan Turner (UA). This project will synthesize best national practices to formulate a new bridge preservation strategy for ALDOT. It will prioritize replacement, rehabilitation and maintenance activities.

Project 06403 "Update School Bus Standard Vehicle for Load Rating Bridges," Dr. Jim Richardson (UA). This project is identifying a representative school bus (weight and axle spacing) for load rating highway bridges, to determine which rural bridges should be load posted.

Education Projects

Project 06101, "Transportation Systems Curriculum for High Schools," Dr Matthew Elam (UA). This project is creating computer-based learning modules for high school students in Hale County. The modules provide exciting exercises to prepare students to study transportation a related discipline in college.

Project 06112, "Development of ITS-related Educational Activities," Dr Steven L. Jones, Jr. (UA). This project is developing educational activities for UA's Intelligent Transportation Systems lab. It includes a graduate course on advanced traffic management, ITS activities for undergraduates, and a professional seminar.

Project 06115, "Advanced Transportation Institute 06," Dr Dan Turner (UA). This is the fifth edition of a UTCA/ALDOT institute. It is introduce rising junior and senior high school high school students to transportation careers through presentations, design labs, field trips and similar activities.

Project 06304, "Summer Transportation Engineering Institute - Phase VII," Dr. Kate Leonard (UAH). This is a continuation of a summer program for encouraging diversity in transportation-related educational programs. Participants are eighth graders, with preference to female and minority students.

Project 06311, "Student Funding to Attend TRB Conference," Dr. Michael Anderson (UAH). This project hosts a student research paper competition to award funding to graduate students to attend the Transportation Research Board Annual Meeting in Washington D.C.

Project 06407, "ITS Education Experiences," Dr Steven Jones (UA). In this project, Dr. Jones is inventorying uses and practices of university ITS laboratories. The project is concentrating on educational aspects, but is also documenting research activities that might be appropriate for UA, UAB and UAH.

Management Projects

Project 06109, "Long-Term Warranties on Highway Projects," Dr Qingbin Cui (UA). This project is investigating the economic and legal viability of using warranty provisions in Alabama highway projects to shift post-construction responsibility for quality control to the contractor.

Project 06121, Traffic Signal Systems on Oversaturated Arterials, Dr. Steven Jones (UA). This project is documenting traffic signal system performance in oversaturated conditions on US 280 in Birmingham and McFarland Blvd in Tuscaloosa to develop guidance and procedures to assist traffic management centers in optimum signal system timing to mitigating congestion.

Project 06122, Federal Transit Administration Workshops, Dr. Jay Lindly (UA). UTCA is supporting the mission of the Federal Transit Administration by hosting three workshops to outline transit research needs in the U.S.

Project 06202, "Transportation Facilities Management under Emergencies," Dr Virginia Sisiopiku (UAB). Dr Sisiopiku is developing a dynamic traffic simulation and assignment tool for pre-planning and evaluation of alternative relief strategies, for use by transportation decision-makers in the Birmingham area.

Project 06211, Emergency Reconstruction of Critical Transportation Infrastructure," Dr Wilbur A. Hitchcock, (UAB). This project is reviewing methodologies employed in Alabama for damage assessment, redesign, construction contracting, funding, etc. in response to infrastructure damage from natural disasters or terrorist acts.

Project 06306, "Alabama MPO Freight Transportation Forecast Tool," Dr. Michael Anderson (UAH). This project is developing an Alabama-specific freight transportation forecast tool for tradition urban transportation modeling schemes used by Alabama MPOs.

Miscellaneous Project

Project 06406, "ASAP Air Quality Evaluation," Dr. Steven Jones (UA). This project is determining the extent to which Alabama Service Assistance Patrol vehicles reduce air pollution in Jefferson County by assisting broken down motorists to get underway again, thus keeping I-20/59 traffic moving and removing emissions from idling vehicles. (Subcontract to Auburn University)

Safety Projects

Project 06408, "Technical Services to Support Implementation of the Alabama Strategic Highway Safety Plan," Dr Dan Turner (UA). This project provides technical and managerial assistance to steer a 100-volunteer workforce in implementing a multi-agency comprehensive traffic safety plan.

Project 06410, "County Engineer Safety Workshop," Dr Dan Turner (UA). This project will prepare, and present a workshop for Alabama County Engineers. The objective is to mitigate single vehicle run-off-road (ROR), head-on, and sideswipe collisions on county roadways.

Tech Transfer Project

Project 06113, "Annual Technology Transfer Program Continuation," Dr Steven L. Jones, Jr. (UA). Dr. Jones is conducting the UTCA technology program, including a tech transfer newsletter (the *Signal*), seminars, and the annual Research Symposium. A tech transfer Advisory Committee steers the project.

Want More Information About One of These Projects? For more complete information about a UTCA project, visit our web site at

(<http://utca.eng.ua.edu/>)

From there go to the "projects" page and search for the information you need by looking for the project PI, project number, or project name. If a final report is available, you may download it from our web site.

Need a project? Does your agency or firm have a problem that UTCA can solve? Or, do you need a short course? Over 40 different professors have conducted UTCA projects, meaning that a wide range of expertise is available for your project.

The best part is that UTCA may already have half of the funding to conduct your project. Conduct the UTCA headquarters office to discuss your ideas.

Advisory Board – The UTCA Advisory Board takes an active role in guiding UTCA through actions like identifying goals, defining the Annual Research Plan, evaluating proposals, studying new issues, and selecting the UTCA Student of the year. A subcommittee of the Board performs an annual evaluation of UTCA’s progress toward accomplishing its strategic plan. We are grateful to the dedicated leadership of the following members of the Board.

CHAIR:

Don Vaughn, ALDOT
Chief Engineer/Deputy Director

City Engineer:

Joe Robinson, City of Tuscaloosa
DOT Director/City Engineer

FHWA Resource Center:

Grant Zammit,
Arterial mgmt and signal systems

Highway Representative:

Fred Conway
ALDOT Bridge Engineer

Legislative:

(*appointment pending*)

Trans Consulting Engineer:

James Brown,
President, Almon Associates

VICE CHAIR:

Mark Bartlett, Administrator,
Alabama Division FHWA

Construction Industry:

Billy Norrell, Executive Director,
Alabama Road Builders Association

FHWA Office of Trans Management:

Eddie Curry, Traffic analysis and
performance measures

Highway Representative:

Larry Lockett, ALDOT
Materials and Tests Engineer

MPOs:

James Moore,
Alabama Trans Planning Association

Transit:

Steve Ostaseski,
Gresham Smith, Inc.

Academic Research:

Brian Smith, U of Virginia,
Virginia Trans Research Council

County Engineer:

Randy Cole
Shelby County Engineer

Highway Representative:

Don Arkle, ALDOT Asst. Chief
Engineer for preconstruction

Logistics/Commercial Vehicles:

George Overstreet
Alabama Trucking Association

Safety Organization:

(*appointment pending*)

State Agency Representative:

(*appointment pending*)

University Transportation Center for Alabama
The University of Alabama
Dept. of Civil & Environmental Engineering
Box 870205
Tuscaloosa, Alabama, 35487-0205
USA

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