

UTCA Annual Research/Training Plan

(For Projects Starting January 1, 2011 or later)

Theme: Management and Safety of Transportation Systems

- *The list shown below represents a compilation by the UTCA Advisory Board of high-priority topics within UTCA's theme.*
- *Proposals will be accepted on any topic; however, highest priority will be given to projects that directly support items I.1 through I.4 from the list below.*
- *Second highest priority will be give to projects in transportation education, diversity, and technology transfer.*
- *Proposals will be accepted for other projects shown in the 2011 Annual Research/Training Plan, with priority given to those that directly support the UTCA theme.*
- *Proposals will be accepted for other projects not shown in the 2011 Annual Research/Training Plan. Those proposals will be judged on individual merit and support of the UTCA theme.*

I. High Level Topics to Support National Surface Transportation Research:

Faculty and staff desiring to conduct UTCA research on maximizing traffic efficiency and mitigating congestion should select projects from I.1 and I.2 below or specific national projects identified in such publications as the "Operations and Mobility" theme from the R&T Partnership Report entitled *Highway Research and Technology: The Need for Greater Investment* (<http://gulliver.trb.org/publications/rtforum/HwyRandT.pdf>).

1) Mobility/Capacity – Road use continues to grow faster than the ability to provide additional roadways and roadway improvements.

- Investigate capacity enhancements to offset increasing traffic demands and to maintain future mobility on the Alabama roadway system.
- Investigate more efficient signals, signs, etc.
- Communicating with drivers through emerging technologies such as social media
- Identifying candidate roads for managed lanes in Alabama.

2) Freight Mobility/Capacity: The use of heavy vehicles (18 wheelers) is the backbone of logistics and economic success, and national projections predict that freight shipments will double in the next ten years.

- Investigate the impact that doubling of trucks will have on the Alabama road system.
- Investigate cost-effective ways to provide truck capacity to underwrite the state's economy and to ensure overall mobility for Alabama drivers.
- Determine how much cost road congestion adds to highway user costs in the long run.
- Investigate truck safety
- Alabama is designated a "focused state" for truck issues. How can this benefit the state?

3) FTA Projects – (*It is probable that UTCA will fund one or more transit projects*) – The UTCA Advisory Board lists two potential topics below, but other pertinent research proposals are encouraged.

- Considering/integrating transit in the "complete street" environment.
- Connectivity of transit and transportation systems. Example: what will "town centers" need to know to help them connect to proposed high-speed rail?

4) Infrastructure Sustainability – Identify methods to maintain transportation infrastructure to an acceptable level over the long term.

- Investigate methods to improve the durability and cost-effectiveness of pavements
- Investigate methods to improve the durability and cost-effectiveness of bridges.
- Investigate impact of proposed legislation (example: increase axle limits)
- Investigate new materials and designs that would enhance the transportation infrastructure.

II. Topics Important to UTCA’s Future - (It is probable that UTCA will fund one or more projects in this area.)

(1) Diversity: Create programs to enhance diversity among incoming students, undergraduates, graduate students, faculty members, and staff members. This might include the development of promotional materials, identification of incentives for students and faculty, and special educational program. A team approach (UA, UAB, and UAH representatives) is recommended.

(2) Human Resources: Develop means to increase the number of students, faculty, and staff that are attracted to and participate in programs of UTCA. It might be aimed at K-12 outreach, recruiting materials, scholarships, or other recruitment techniques. A team approach (UA, UAB and UAH representatives) is recommended.

(3) Technology Transfer: Develop and teach short courses for transportation professionals in Alabama. Subject areas are open, as long as they meet significant and marketable needs in the transportation field and fit the UTC theme. Enhance the infrastructure of the ITS lab on the Tuscaloosa campus through innovative projects, connections to State camera systems, etc.

III. Other Topics Identified by UTCA’s Advisory Board - (Funding is possible but not assured for the following projects)

ALDOT Research Needs:

1) ALDOT Project Scheduling/Delivery Methodology

- Investigate methodologies to prioritize projects
 - What are statewide vs. local needs in safety, bridge deterioration, etc?
 - What percent of budgets should be spent on preserving existing vs. building new facilities?

2) Traffic Control Devices: Investigate whether the change in traffic stripe widths contributed to better traffic operations and better traffic safety. This project could possibly include investigation of the effectiveness of other traffic control devices like delineators and chevrons.

3) Human Resources: Develop a model program to enhance ALDOT recruiting, hiring and retention of young engineers. Development of the program should consider issues such as the roles of scholarships, internships and part time/summer employment for students, career choices among civil engineering discipline areas, salary, promotion, retroactive acknowledgement of passing the FE Exam, acknowledgement of passing the PE Exam, and other pertinent factors.

4) Emergency Evacuation: Perform a quantitative study that shows when contra-flow should be triggered on I-65 during emergency evacuation.

5) Overweight Loads: Investigate the coordination that must occur between state government and local government concerning oversize/overweight loads.

6) Night Construction: Compare night construction vs. day construction to analyze the differences in construction quality.

7) Partner with CAPS: Work with the Center for Advanced Public Safety (CAPS):

- To mine data on scofflaw overweight vehicle operators to determine where to concentrate enforcement operations.
- To investigate how to pre-screen and pre-select potential locations for virtual weigh stations.