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for Alabama

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UTCA Newsletter

Introduction

After a year and one-half of existence, UTCA operations are changing from “start up” to “fast growth.” Faculty members previously involved in transportation have joined with emerging young faculty to produce an interesting mixture of projects. In fact, more than 90 faculty members from 35 different academic units on the three UA campuses have written proposals, and more than 65 projects are being conducted (or have been completed) under the UTCA banner. Such rapid growth brought hectic times for the Center’s staff, but it has been fun and real progress has been made in serving the citizens of Alabama.

We hope that you enjoy reading about a few of our projects. Remember that we are always glad to talk with you about your needs or your vision for the transportation future of our State, so feel free to call at any time.

UTCA Advisory Board

State Transportation - Don Vaughn
(Chair), Alabama DOT

Cities - Joe Robinson, Tuscaloosa DOT

Construction - Billy Norrell, Alabama
Road Builders Association

Counties - Randy Cole, Shelby County
Engineer

US DOT - Joe Wilkerson, Alabama
Division FHWA

Highways - Larry Lockett, Alabama DOT

MPOs - David Norris, West Alabama
Planning & Development Council

Transit - Steve Ostaseski, Regional
Planning Commission for Greater
Birmingham

Trucking - Mr. James Suttles, Suttles
Trucking

Advisory Board Evaluates UTCA

At the request of the UTCA Executive Committee, the Advisory Board appointed a subcommittee to evaluate the first year of operation. Members of the evaluation team were Mr. Larry Lockett of ALDOT (Chair), Mr. Terry Bunn of Bunn Construction and Mr. Joe Wilkerson of FHWA.

The team concluded that the first year of operation was very successful. Several examples were cited, including increased students and faculty from diverse backgrounds participating in transportation issues. The system for distributing research funding was found to be fair and thorough, the theme topic was good and UTCA was found to be “listening” to its stakeholders. The evaluation subcommittee did note some areas that need strengthening, primarily in establishing a multi-disciplinary program of transportation coursework.

The UTCA Executive Committee appreciates the efforts and assistance of its Advisory Board, and thanks the subcommittee for conducting such a thorough evaluation and making good suggestions for improvement.

Advisory Board Prepares Annual Research Plan

The Advisory Board identifies important transportation issues in Alabama for the near future, in both broad categories and specific issues. The Executive Committee refines these ideas into lists of desirable research and training projects, most of which revolve around the UTCA theme of “*MANAGEMENT AND SAFETY OF TRANSPORTATION SYSTEMS.*” These are compiled as the “Annual Research Plan” which is provided to faculty members to help them prepare proposals for projects. The 2001 Plan may be reviewed on the UTCA website. UTCA welcomes new ideas for projects. Contact us if you want to suggest a project for the Annual Research Plan.

SAMPLE PROJECTS

Safety Project Spreads Throughout the Southeast

UTCA is conducting a very large, multi-year project under contract to ALDOT. The goal of the *Safety Public Awareness* project is to raise safety awareness and decrease fatal and injury crashes on Alabama highways. The project includes items like extensive radio and television spots, public service announcements, newspaper editorials, brochures and video messages at rest areas and welcome centers, and child safety seat checkpoint training.

There are two good success stories for this project. The first involves the coordination and networking of agencies, private sector participants and interested individuals. The primary government partners are the Alabama Department of Transportation, Alabama Department of Public Safety, Alabama Department of Economic and Community Affairs, Alabama Department of Tourism, Federal Highway Administration, and National Highway Traffic Safety Administration. Of the private sector partners, the most prominent have been Children's Hospital of Birmingham and the McDonald's Corporation.

The second success involves a seat belt campaign featuring Ronald McDonald and the slogan, "Every time, Every trip, Every day, Buckle up." Posters, decals, and bumper stickers and examples of "buckled up" citizens have been widely distributed. This Alabama public-private partnership was featured at a National Highway Traffic Safety Administration regional safety meeting in the spring of 2000. As a result, all eight southeastern states voted to join the UTCA-McDonald's program. NHTSA is guiding the effort, and UTCA is helping to develop the public relations materials for a regional campaign.

Transit Research Continues

In its first eighteen months, UTCA conducted two research projects involving public transportation in Alabama. The purpose was to access the current status of transit, to identify barriers to improvement, to identify

resource needs, and to offer recommendations for improvements. Dr. Jay Lindly at UA successfully conducted both of these studies (projects 99104 and 00469), with one funded by UTCA and the other by ALDOT.

The transit initiative has continued in 2001, with two additional projects authorized by the UTCA Executive Committee. In project 01452, Dr. Jay Lindly (UA) is gathering data to evaluate and manage intercity bus service. This project is very similar to his previous efforts in gathering data for rural public transportation programs, and will be conducted by using reports filed by carriers, government records, on-site records, and visits to terminals. Dr. Steven Jones (UAB) is investigating technology applications that might improve public transportation in project 01216. His study will evaluate automatic vehicle location systems, computer dispatching of vehicles through GIS, electronic fare payment, advanced traveler information systems, and other uses of technology to find those that might be most effective in Birmingham. These technologies could then be transported to other public transportation systems in Alabama.

Counties Face Bridge Problems

There are 8,832 county bridges in Alabama, many of which need treatment to restore or prolong their service lives. A survey by the Alabama County Engineers Association found about \$500 million of funding is needed to replace structurally deficient bridges. UTCA is conducting several projects to help solve the problem.

Dr. Jim Davidson of UAB is the Principal Investigator of two county bridge projects in cooperation with Shelby County. The first involves preparation of a database for short-length bridges that are not included in the national bridge inventory. Data items are being identified and gathered as the basis for decisions on the most cost-effective treatments for county-type structures (maintain, repair, or replace?), and software is being prepared to help county engineers use the data to set treatment priorities.

The second project involves the use of "flowable fill" as a way to reduce the cost of replacing bridges and large drainage structures. Flowable fill is a low-strength concrete-like material that can be placed quickly and easily. It can be used around an existing drainage structure to increase its strength or lengthen its useful life. Flowable fill can provide an option to massive amounts of earthwork, reducing time and labor on a project. Other states have had good success with flowable fill, and Dr. Davidson is identifying applications and locations that will be cost-effective for Alabama counties.

Dr. Mike Triche at UA is conducting another county bridge project, examining historical data from the Alabama Bridge Inventory to determine the bridge types and bridge materials that have worked best for low volume roads. He will use this information to develop a series of standard designs that counties can use to fit their most common bridge replacement situations. His emphasis is on low cost and durability to help counties get the most for their money.

Local road bridge replacement is a formidable challenge, and UTCA anticipates conducting additional bridge projects to assist counties with their road and bridge needs.

All Modes Covered

UTCA is proud that it is conducting projects in virtually all modes of transportation in Alabama. About 55% of the projects in the first two years have dealt with highway transportation—by far the most common mode of travel in Alabama. About 20% of our projects have been non-modal (for example, education or general safety in nature). Another 10% have dealt with transit. Particularly interesting are UTCA's first projects involving the water, air, and rail modes.

Water Mode Dr. Jay Sterling (UA) is the Principal Investigator for project 00457 to evaluate the State Docks in Mobile. His study has identified a short-term, rapidly growing container-shipment market in South America as the most appropriate target for the State Docks. The huge volume of containers

that will be shipped will require a significant investment in dock facilities if Alabama is to acquire this market. Dr. Sterling's study is identifying port configurations and equipment that would make Mobile the port of choice for this new volume of shipments.

Air Mode Dr. Charles Haynes (UA) is assisting the Aeronautics Bureau of ALDOT (formally the Alabama Aeronautics Commission) by teaching a course on airport design to civil engineering students, and by placing a student intern with the Bureau for the year 2001. This student will begin to develop databases and to assemble information that will help the Bureau manage air travel in Alabama. This project (number 01111) is described in more detail elsewhere in this newsletter.

Rail Mode Drs. Haynes and Sterling are conducting UTCA's first rail study (project 00113). It is an analysis of the cost of rail freight movement to answer a perplexing question that is vital to Alabama's coal industry. Currently it costs more to ship coal from Alabama to Georgia than from Wyoming to Georgia. This gives Wyoming coal producers a huge advantage over this State's producers. The two UTCA researchers will be examining the Alabama rail tariff structure to determine the reasons, and to suggest modifications to allow Alabama coal to be competitive.

New Projects for 2001

UTCA has selected 12 projects for initial funding in 2001, as briefly explained below. Keep watching this Newsletter as more projects are authorized during the year.

- *Gearing Up for Transportation Engineering Summer Institute*— Dr. Kate Leonard (UAH) will repeat and expand her highly successful summer program for middle school students, as explained in a feature article elsewhere in this newsletter.
- *Maintenance System for Stormwater Infrastructure* — Dr. Rocky Durrans (UA) is preparing a GIS-based management system for location, design, and maintenance information for existing storm water infrastructure. It will be pilot-tested through data collection on State and federal routes in Tuscaloosa County.
- *Development of a New Experimental Approval for Bridge Deck Evaluation* — Dr. Houssam Toutanji (UAH) will use non-destructive evaluation techniques to investigate bridge deck crack types, widths and depths. The purpose is to find better ways of gathering data to predict which bridge decks need repair or replacement.
- *Integrated Traffic and Emergency Response Success Factors* — For E-911 purposes, Congress has mandated that future cell phones include a device that can be used to determine their locations. Dr. Mickey Bunn (UA) is leading a project to determine if data from such cell phones can be used to track traffic flow, and to respond to congestion and emergency medical situations.
- *Enhancement of Emergency Evacuation Procedures* — Dr. Michael Triche (UA) is trying to improve emergency evacuation procedures along the Gulf Coast through the use of technology. His research will center on ITS, GIS, and GPS technologies to help monitor and move massive volumes of traffic in emergency conditions.
- *Innovative Use of Flowable Fill for LRB Replacement*— Dr. James Davidson (UAB) is investigating the use of flowable fill (low strength cementitious material) as an option for local roads bridge replacement. Other states have found significant labor savings in using flowable fill for bridge projects, and around utilities and storm sewer pipes.
- *Deployment of Advanced Public Transportation in Birmingham* — Dr. Steven Jones (UAB) will investigate techniques like automatic vehicle location systems, GIS/computer-aided dispatch, electronic fare payment, advanced traveler information systems, and others for application in the Birmingham area. His research could lead to improvements that are applicable to other state transit systems.
- *Trip Generation and Travel Rate Indices in Alabama* — Transportation planners, MPOs, and ALDOT depend upon a series of models to determine future travel patterns and volumes. Dr. Michael Anderson (UAH) is improving the trip generation model by making it easier to use. He is also determining appropriate values for the travel rate index, an important modeling parameter.
- *Aviation Transportation Internship 2000*— A student working for Dr. Charles Haynes (UA) will intern for a year with the Aeronautics Bureau of ALDOT, working on tasks like developing an incident/accident database, examining airport licensing standards in other states, and assessing the distribution of regional second-tier airports.
- *Design and Quality Control of Concrete Overlays and Repairs* — Dr. Norb Delatte (UAB) is designing and testing a wide range of overlay mixes for both bridge decks and pavements. The idea is to develop state-of-the-art mixes and procedures that can be applied nationally. This project is partially funded by the Concrete Research Council of the American Concrete Institute.
- *Feasibility Study on Dynamic Bridge Rating* — Many older bridges are restricted to low-weight loads, but ALDOT can sometimes remove a load restriction through a field test to verify a bridge's capacity. But the bridge must be closed to traffic and the test is expensive. Dr. Shenen Chen (UAB) is looking for a less expensive method to conduct field tests without closing the bridge.

Middle School Program A Success

Dr. Kate Leonard of UAH conducted a summer institute June 19-23 in Huntsville. Drs. Mike Anderson and Houssam Toutanji of UAH, Dr. Norb Delatte of UAB, and Dr. Jeanelle Hodges of UA assisted in the project. Twenty middle school students, representing female and minority groups, participated in the "Gearing Up for Transportation Engineering Summer Institute." They investigated transportation specialty areas like bridges, space transportation, alternative energy, transportation safety, construction materials and soils. The course featured guest speakers, field trips, and "hands-on" lab activities conducted in small groups. The course ended with a competition between groups for the best prototype invention. The students were favorably influenced toward careers in transportation, and expressed their appreciation and enjoyment of the course. Based upon the resounding success of the Institute, Dr. Leonard will conduct an expanded version in 2001 (see new project list).

Seminars Conducted in 2000

Video for Traffic Management and Safety – Dr. John McFadden, March 14, UA.

Language of Leadership – Dr. Ron Dulek, June 7, Gulf Shores, Annual Meeting, Alabama Section ITE.

TRANplan and Arc View Workshop – Dr. Mike Anderson, June 14-15, Gadsden, quarterly meeting, Alabama Transportation Planners Association.

Use of Aggregates in Transportation – Dr. Norb Delatte, September 28, UAB.

Concrete Pavement Restoration – Dr. Norb Delatte, November 2, UAB.

Concrete Technology for Transportation Professionals, Dr. Houssam Toutanji, November 9, UAB.

Intelligent Transportation Systems – Dr. John McFadden, December 7, UAB.

Structural Reliability for Transportation Designs – Mr. S. Chen, December 14, UAB.

Need a Laugh?

While visiting another city, a man noticed a flash of light as he drove through an intersection. Curious, he circled back and spotted a camera aimed at motorists. "Ah," he thought, "they are using photos to give traffic tickets." He slowed way down this time but the camera flashed again. Determined, he circled again and drove as slowly as he dared in the rush-hour traffic. Still the camera seemed to pick out his car as it flashed. He drove home, upset and thoroughly frustrated at the malfunctioning traffic camera. It was ironic when weeks later he opened his mail and found three citations for failure to wear his seatbelt!

Actually, there are valid reasons why photographic enforcement might be needed in Alabama. Right-angle accidents (i.e., your car getting hit from the side) have high severity rates, with a high percentage of serious injuries and fatalities. Intersection photo-enforcement programs in other states have produced strong reductions in red-light-running and accidents. It might be time to try such a program in Alabama.



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