RITA Office of Research, Development, and Technology

UTC Spotlight

University Transportation Centers Program

March 2010

This month: UTCA – University Transportation Center for Alabama, Tuscaloosa

University of Alabama

This monthly report from the University Transportation Centers Program highlights some of the recent accomplishments and products from one of the University Transportation Centers (UTCs). The UTC Program is administered by the U.S. Department of Transportation's Research and Innovative Technology Administration.

UTC 1987 2010

U.S. Department of Transportation

Research and Innovative Technology Administration

Improving Student Safety:
School Bus Seat Belt Pilot Program

The University Transportation Center for Alabama (UTCA) is conducting a 3-year pilot study to assess the impact of lap/shoulder seat belts on the safety of students in school buses. After a tragic school bus accident in Huntsville, Alabama, Governor Bob Riley appointed a seven member study group to review laws in other states, interview seat belt experts, and suggest further actions. The group found that there were no comprehensive studies on the subject.

UTCA

Camera view from inside school bus.

The Alabama State Department of Education awarded a project to UTCA to conduct such a study. The Department also provided allocations to 10 participating local school systems to purchase 12 new buses equipped with lap/shoulder seat belts, to provide fuel and maintenance services for these buses, and to provide aides in several of the buses. Four ceiling-mounted video cameras were installed on each bus to gather data on the percentage of students using the seat belts properly.

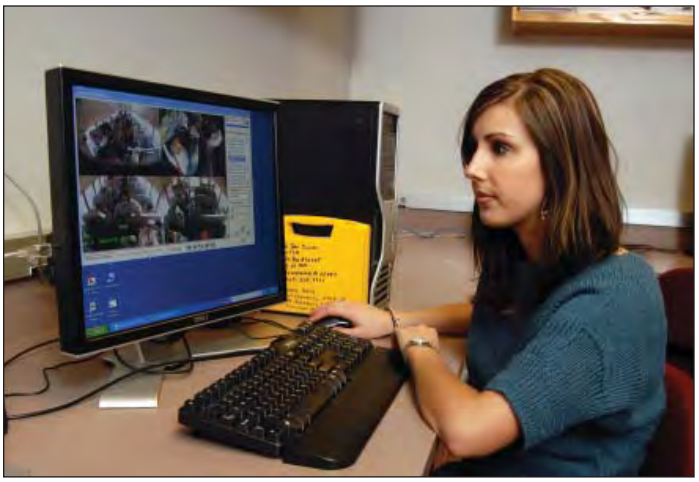
"This is a ground-breaking research project in safety," explained Dr. Dan Turner, principal investigator of the research team. "Eight states throughout the country now have laws that require some form of seat belts in school buses, and other states would like to require them, but there are no scientific studies on this topic. The UTCA team is reviewing the effectiveness of different types and uses of seat belts, and the team is using technology to gather information about school bus seat belt use and safety in Alabama."

All aspects of the pilot study will be determined and completed by UTCA researchers:

- gather seat belt use rate data,
- prepare an analysis of national and Alabama school bus crash data to determine trends and to predict the reduction of fatalities due to seat belts,
- determine the loss of seating capacity and alterations needed in the Alabama school bus fleet if lap/shoulder seat belts were adopted, and
- prepare a cost-benefit analysis.

The project began in 2007 and will conclude in 2010. During the 2008–2009 school year, UTCA student researchers made 65,000 observations of individual pupils to determine whether they were wearing their seat belts.

"The first 2 years of our study have given us insight into the basic pattern of school bus seat belt use by Alabama's school children. The third and final year will allow us to vary some of the basic parameters of the study to determine how that affects results," explained Dr. Jay Lindly, Executive Director of The University Transportation Center for Alabama. "For example, does changing the bus driver on a route affect seat belt usage, or does adding an aide to a route affect seat belt usage? Will mandatory use be effective? That is what we will be testing this next year."



University of Alabama

Student researcher coding observations of pupils.

For the study, each rider was trained and encouraged in seat belt use, but belt use was not required. On the advice of previous researchers, students were observed on Tuesday through Thursday afternoons, when belt use is most consistent (Mondays and Fridays, national test days, and other factors make seat belt use less consistent). However, in one control bus, students were observed both morning and afternoon, Monday through Friday. The preliminary results for 2008–2009 show the following characteristics:

- 63 percent of students wore belts appropriately.
- 8 percent wore belts inappropriately (with the strap behind their backs, with arms and legs in the aisle, etc.).
- 29 percent did not wear belts.
- Use varied widely by bus, with a high of 95 percent usage and a low of 5 percent usage.
- Usage dropped as the route progressed because students changed seats, became fidgety, etc. Usage at the beginning of the route averaged 64 percent but dropped to 55 percent by the end of the route.
- When data from the control bus allows researchers to estimate belt usage during the entire week (not just Tuesday through Thursday afternoons), appropriate belt usage decreased from 63 to 53 percent, reflecting the lower use rates on morning routes and on Mondays and Fridays.

Dr. Dan Turner explained that detailed results will not be released until the study is completed so that seat belt use during the remainder of the study does not arbitrarily change as the result of a news article. That would make it impossible to measure the effectiveness of the third year's experimental safety treatments.

UTCA has been in contact with multiple states, the National Transportation Safety Board, the National Highway Traffic Safety Administration, and other national agencies. They are awaiting the results of the study to help determine whether or not the adoption of seat belts in school buses is feasible and safety cost-effective. In effect, this project will inform national decisions.

About This Project

Dr. Jay K. Lindly is the Executive Director of The University Transportation Center for Alabama and a co-Principal Investigator on this project. Leading the research project is Dr. Daniel Turner, Professor Emeritus at The University of Alabama and current member of the Technical Activities Council of the Transportation Research Board of the National Academies. Two professors from The Center for Advanced Public Safety (CAPS) at The University of Alabama complete the research team – Dr. Allen Parrish and Dr. David Brown, both Professors of Computer Science. The faculty members of the research team gratefully acknowledge the indispensible contributions of the nine undergraduate, four graduate, and two staff team members.