PROJECT NUMBER: 02115

PROJECT TITLE: Traffic Safety Analyses: A Data Mining Approach

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PROJECT OBJECTIVE:
Our objective is to employ principles and techniques from the emerging technology of data mining to analyze traffic safety data. Using several publicly available data sets, and working closely with the Alabama Traffic Safety Center at the University of Montevallo (ATSC), we will investigate the construction of traffic safety weighted risk profiles on a countywide basis. These profiles will integrate risk assessment variables as well as county population and vehicle miles traveled.

PROJECT ABSTRACT:
Data analysis methodologies that assist in highlighting patterns of traffic safety offer policy and decision makers valuable tools for accomplishing their tasks of developing and recommending interventions to solve traffic safety problems. Using the ideas and processes from the new area of data mining, this project will investigate new methodologies for the analysis of traffic safety data. The investigations in this project have not been conducted previously and will augment results from other systems, such as CARE.
PROJECT TASK DESCRIPTIONS:
We plan to begin work on the project on January 9, 2002. The initial phase will involve transferring and establishing analysis databases as well as reviewing, checking, and preparing of the databases in appropriate formats for analyses, and refining initial plans for analyses in collaboration with the ATSC. In the second phase, the investigators and graduate students will explore the data graphically using many of the techniques developed previously in UTCA Project 99113 (Conerly, et al., Data Mining and Visualization of the Alabama Accident Database, UTCA Report Number 99113, August 31, 2000). Analyses for the development of the proposed safety index will be conducted and reviewed. Preliminary results from these analyses will be presented to the advisory board. The third phase will involve the refinement of the safety index based on comments and suggestions of the advisory board and the Alabama Traffic Safety Center. The fourth phase of the project will involve the final analyses for the safety index, and convening a second meeting of the advisory board to review the results obtained. This phase will conclude with the preparation of a report and presentation of findings for interested parties.

MILESTONES AND DATES:
January 9, 2002  Start Project
March 15, 2002  Complete Phase I (establishing databases)
June 30, 2002  Complete Phase II (prelim. analyses and review)
September 15, 2002 Complete Phase III (refinements)
December 31, 2002 Complete Project

TOTAL BUDGET:
One-year project: UTCA $49,997; Matching $59,958; Total $109,955.

STUDENT INVOLVEMENT:
We plan to employ two graduate students to assist with the data management and analysis of this project. Each of these research assistants will be assigned to this project on a 1/4 FTE basis for the calendar year. They will be involved with programming, database creation and maintenance, and the statistical and data mining processing of the data. In addition, this proposal promotes UTCA’s human resources and diversity goals by giving preference to employing qualified minority graduate students.

RELATIONSHIP TO OTHER RESEARCH PROJECTS:
Our research project has no direct relationship with any other proposals being submitted to the University Transportation Center for Alabama in this round of proposals. Our proposed project is closely aligned with the activities of interest to the ATSC, directed by Mr. Marty Spellicy. We intend to employ ATSC a consultant on this project.

TECHNOLOGY TRANSFER ACTIVITIES:
We will make presentations to Department of Transportation staff members. Presentations will be made to academic groups comprised of those interested in traffic safety, as well as those whose primary interest will be the process of the data analysis. Written reports would be disseminated to district offices via ALDOT. Professional
articles would be targeted to journals such as the Journal of Transportation and Statistics and The American Statistician. Presentations will be targeted for Transportation Research Board conference and the Joint Meetings of the American Statistical Association. Working with ATSC, we will seek other venues for disseminating the results of this project, in particular, through educational formats sponsored by ATSC.

POTENTIAL BENEFITS OF THE PROJECT:
The techniques employed and the results generated by this project can benefit the state of Alabama in several ways. The investigation will produce results that will provide insights into relations that may not have been considered previously, and produce reports that will enhance the education activities of the Alabama Traffic Safety Center as well as other agencies. Additionally, the process by which this investigation is conducted will be transferable to the Alabama Department of Public Safety.

TRB KEYWORDS:
Education, Safety, Data Mining, Graphics, Statistics.