UTC PROJECT DESCRIPTION

PROJECT NUMBER:
99244

PROJECT TITLE:
Development of a GIS-Based, Hazardous Materials Transportation Management System

PRINCIPAL INVESTIGATORS:
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PROJECT OBJECTIVE:
To develop a low-cost, portable, easy-to-use, "proof-of-concept" system that could aid in transportation management and safety. It is envisioned that such a system will be a PC-based application program that will be GIS-based and will assist, specifically, in the transport of hazardous materials.

PROJECT ABSTRACT:
Transportation planners and managers must constantly provide for rapid and safe transportation of large quantities of hazardous materials. Within Alabama, a combination of expanding industries and "urban sprawl" has created a situation where hazardous waste is being transported in close proximity to highly populated areas, increasing the exposure risk to these materials. To serve Alabama, this project will work to develop a low-cost,
portable, easy-to-use "proof of concept" routing system to minimize exposure. Work tasks from this project will identify typical waste movements, identify adverse impacts and sensitive areas, build a level-one GIS for Alabama identifying sensitive locations and a routing priority system developed with input from safety responders, and test the applicability of such a system for daily managerial operation and scheduling. Successful completion of this research effort will result in a GIS-based, hazardous waste routing system capable of identifying potential risks and minimizing incident impacts.

PROJECT TASK DESCRIPTIONS:
Task 1. Determine the storage locations and likely destinations (e.g., landfills, TSDs) of hazardous materials.
Task 2. Determine the likely adverse impacts (based on types of materials moved).
Task 3. Identify sensitive areas (schools, shopping malls and other public meeting locations, railroad crossings, bridges, etc.).
Task 4. Determine availability of data identified in Task 3 (especially in digital/ARCview formats).
Task 5. Collect transportation and socioeconomic data from 3 and build GIS databases.
Task 6. Use proximity to items in 3 to define ranking mechanism and scoring criteria for transportation database in 5.
Task 7. Code User Interface and GIS to respond to Task 6.
Task 8. Test the system; compare to actual traveled paths for hazardous waste movements.
Task 9. Report, documentation, papers, etc.

MILESTONES AND DATES:
Task 1 – July-September 1999
Task 2 – August-November 1999
Task 3 – August-December 1999
Task 4 – November-December 1999
Task 5 – November 1999–January 2000
Task 6 – December 1999-February 2000
Task 7 – January-March 2000
Task 8 – February-May 2000
Task 9 – May-July 2000

TOTAL BUDGET:
One-year project: UTCA $32,116; total budget $64,232.

STUDENT INVOLVEMENT:
This project involves one graduate student working towards a Master of Science degree in Civil and Environmental Engineering at UAB.

RELATIONSHIP TO OTHER RESEARCH PROJECTS:
This project can be viewed as a stand-alone project as it does not tie into any other UTCA projects.
TECHNOLOGY TRANSFER ACTIVITIES:
This project supports the technology transfer goals of the UTCA as tools and methods identified and developed during the course of this research will be made available to interested personnel through software distribution, technical documentation development; and potentially, end-user workshops to be held during the final months of this award.

POTENTIAL BENEFITS OF THE PROJECT:
This project will increase student numbers by employing and training a graduate student. In addition, this project's technology transfer agenda will develop contacts with personnel throughout the state not having direct connections with the UTCA, such as motor carriers operators and managers, and State, County, and City highway safety officials (e.g., Police, Fire Chiefs, and HazMat and Paramedic crews).

TRB KEYWORDS:
Hazardous materials, Geographic Information Systems, traffic control, risk management.