PROJECT NUMBER:
06121

PROJECT TITLE:
Traffic Signal Systems on Oversaturated Arterials

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PROJECT OBJECTIVE:
The objective of this project is to develop an understanding of traffic signal system performance in oversaturated conditions such as emergency scenarios. The project will focus on collecting comprehensive data from existing signal systems on oversaturated arterials, analyzing this data with modern analytical tools, and developing guidance and procedures to assist traffic management centers in optimum signal system timing to mitigating congestion.

PROJECT ABSTRACT:
The project will entail full-scale, long-term monitoring of two traffic signal systems on congested arterials. Both arterials, US 31 in Hoover, Alabama and US 82 in Tuscaloosa, Alabama operate in oversaturated conditions on a recurring basis. The two corridors are subject to significant events of non-recurring congestion. US 31 often serves as a diversion route for a parallel interstate corridor and US 82 is subject to episodes of special event traffic (University of Alabama football games, etc.). Both corridors have existing traffic signal systems and are under surveillance and control form local traffic management centers (TMCs). Additionally, both corridors are important facilities for
evacuation and other emergency management functions in their respective regions. There is a three pronged basis for the project:

- Utilizing existing traffic signal system technologies to collect and report system performance under saturated conditions;
- Utilizing traffic analysis tools (microsimulation, dynamic traffic assignment, etc.) to develop methodologies to predict the impact of signal timing changes; and
- Development of guidance and procedures for use by TMCs to realize the full potential for utilizing traffic signal timing to mitigate congestion on oversaturated arterials and enhance emergency management.

TASK DESCRIPTIONS:
The proposed project will be accomplished via the tasks listed below. Each task will be led by one of the three campuses but all will work together to ensure coordination among tasks and results.

Task 1 – UAH will review and synthesize literature to clearly define issues and challenges.
Task 2 – UA will identify data needs for arterial and signal system monitoring and modeling, and security two city partners to provide the data.
Task 3 – UAB will select existing traffic analysis tool(s) appropriate for modeling oversaturated arterials.
Task 4 – UA will develop a plan to conduct long-term monitoring of the study corridors to collect and characterize TMC-derived data.
Task 5 – UA and UAB will begin collecting data and archiving data.
Task 6 – UA, UAB and UAH will begin analyzing data sets using existing methodologies and models and documenting shortcomings.
Task 7 – UA, UAB and UAH will examine results of Task 6 and begin modifications to existing tools and development of new ones and appropriate.
Task 8 – UA, UAB and UAH will Test new/modified tools and document results in a final report.
Task 9 – UA, UAB and UAH will seek opportunities to present and publish project results.

PROJECT SCHEDULE - MILESTONES
Task 1: Aug - Oct 06
Task 2: Sep - Dec 06
Task 3: Sep - Dec 06
Task 4: Jan - Mar 07
Task 5: Mar - Aug 07
Task 6: Apr - Dec 07
Task 7: May - Dec 07
Task 8: Jan - May 08
Task 9: Jan - May 08

BUDGET:
This is a two-year project that will expend $120,000 of UTCA HPP funds, with a total project budget of $150,000

STUDENT INVOLVEMENT:
The project will engage a transportation graduate student at each of the UTCA campuses.

RELATIONSHIP TO OTHER RESEARCH PROJECTS:

TECHNOLOGY TRANSFER:
The primary technology transfers deliverable from the project will be the final report, and aggressive development of papers and presentations based on the data collection and analysis components of the project as well as the documentation of new and modified traffic analysis tools developed at UTCA.

POTENTIAL BENEFITS OF THE PROJECT:
The proposed project advances the national surface transportation research program by addressing the “Mobility” strategic objective of the FY2005 Research, Development and Technology Plan of the U.S. DOT. In addition, the proposed project is directly responsive to two of the research gaps and opportunities put forth by the FHWA Arterial Management Program in the FHWA/UTC Workshop on Urban/Suburban Mobility and Congestion Mitigation Research held June 6-7, 2006. The project will also provide insight into the “Understanding and modeling of oversaturated conditions” research gap identified under the Traffic Analysis Tools Program at the same workshop.

TRB KEYWORDS:
Traffic Signal Systems, Arterial Management, Saturated Flow