MPC-389

January 1, 2012 – December 31, 2012

Project Title:
Flex Lane Driver Analysis

University:
University of Utah

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Research Needs:

Wide urban roads, with 4 or more lanes can ameliorate congestion through alternating lane use for different conditions such as morning and evening peak flows. In the mornings, most traffic on 5400 South from Redwood Road to Bangerter Highway is eastbound. Conversely, the afternoon flow is heavier from east to west. The concept of re-configuring lanes was pioneered in congested Western Europe where these arrangements are known as *Reversible Lanes*. In Utah, they are known as *Flex Lanes*. Changing a lane's directional designation can deploy capacity where it meets the greater need. Variable overhead signs define lane designation.

While the practice is established, the 5600 South Flex Lane scheme will be the first for Utah. We don't know how the variable lane signs will be perceived. We don't know whether our drivers will accept them readily.

The University has a Driver Simulator that is programmed through micro-simulation. The tool "VISSIM" is connected to the simulator, so that driver subjects may drive along streets and highways that have been built in realistic traffic situations. No University has such a tool. The only other tool is in the FHWA headquarters.

Research Objectives:

1. Assess traffic impacts of alternate operational scenarios.
2. Measure changeable shared median left-turn lane scenario competence.

Research Methods:

1. Construct, calibrate and validate realistic traffic simulation of 5600 S.
2. Code Flex-Lane control into microsimulation.
3. Animate road conditions.
4. Test subject compliance with traffic control.

Expected Outcomes:

An open house at the Utah Traffic Lab will offer the opportunity for UDOT engineers to "drive" the simulation. The research will be documented in a detailed research report, conference, and journal presentations. The work will be presented by the research team.

The research will deliver a:

1. fully validated microsimulation model of scheme under various conditions.
2. documented report showing user acceptance and compliance

Relevance to Strategic Goals:
The proposed project and its expected outcomes are related to the following goals: Environmental Sustainability, and Livable Communities. Flex Lanes make better use of limited road capacity obviating the imperative to build more highways. Flex Lanes reduce queues and congestion contributing to environmental sustainability./

Educational Benefits:
If applicable, describe how students will be involved in the project and any expected classroom or instructional uses of procedures, examples, or discoveries derived from the project. In not applicable, state "Not Applicable" below Educational Benefits, no quotes.

Work Plan:
Small numbers of graduate students and larger numbers of undergraduate students will participate in the project. Their contributions will be rewarded in both assistantships and in academic credit. Undergraduates will incorporate their work into the required class CVEEN3520 Transportation Engineering and CVEEN3100 Technical Communication. Graduate students will write papers, make presentations, and incorporate their work into dissertations and theses.

Project Cost:
Total Project Costs: $65,779
MPC Funds Requested: $27,257
Matching Funds: $38,522
Source of Matching Funds: Utah Department of Transportation

TRB Keywords:
Congestion, control devices, signal control systems, Capacity