

# MPC-388

January 1, 2012 – December 31, 2012

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## **Project Title:**

Title - I-15 Express Lane Dynamic Pricing Assessment

## **University:**

University of Utah

## **Principal Investigators:**

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## **Research Needs:**

Express Lanes and Flex Lanes are two innovative Utah Department of Transportation projects designed to improve mobility in the Salt Lake Metropolitan region. Express Lanes are located along I-15 from American Fork Main Street to Beck Street in Salt Lake City and from State Street in Farmington to the South Layton interchange. Carpoolers, buses, C plate vehicles and motorcycles may use the Express Lanes free of charge. Solo drivers may also use the Express Lanes for a variable fee. The new Express Pass electronic payment system responds to a congestion sensitive algorithm that adjust tolls for solo drivers. The maximum toll is set at \$1. We don't know if this is a realistic maximum or whether an increase is feasible.

So much of toll design depends upon acceptance with traffic impacts taking a secondary role. This research will supply policy makers with a rationale for setting tolls which will help in public acceptance. As it stands, an agency proposes increases and is pilloried. With these findings, at least there will be substantiated independent evidence to support changes.

## **Research Objectives:**

1. Assess the current operation in terms of "buy-in" and the traffic impact on General Purpose Lanes.
2. Construct an algorithm and controls to evaluate the impact of toll changes.
3. Recommend the control parameter regime.

## **Research Methods:**

1. Collect traffic volumes for key sections during peak periods.
2. Sample flows through Traffic Lab observations for validation.
3. Model alternative flow and toll regimes.
4. Analyze and conclude.

## **Expected Outcomes:**

The project will provide detailed recommendations on how to develop the pricing system for the Express Lane. These findings will be based on rigorously detailed modeling that will give the State DOT insight and understanding of the relationship between toll levels and congestion impacts. This will equip the DOT to make more informed decisions on future plans. It will also fortify the DOT with strong independent analysis to justify future changes. Tolling is a highly (p)olitical process.

### **Relevance to Strategic Goals:**

The proposed project and its expected outcomes are related to the USDOT goal of Environmental Sustainability. Tolling of Express Lanes is the introduction of a Price Mechanism to the scarce resource of roadway travel. In the past the demand for time sensitive road transportation facilities was controlled by little more than congestion itself. With only crude gas taxes, drivers were able to travel at any time with only their own marginal costs affecting their choices. Public costs rise disproportionately. The more we understand the impact of pricing mechanisms on traffic behavior, the more we will be able to sustain our road transportation system.

### **Educational Benefits:**

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.

### **Work Plan:**

1. Assess existing conditions (month 1-3)
2. Collect field traffic data online, CCTV, & Traffic Monitoring Stations (month 4-10)
3. Construct, calibrate, and validate toll-traffic algorithm (month 11-17)
4. Interim Report (month 12)
5. Run tests (month 15-20)
6. Analyze data (month 16-22)
7. TLN seminar (month 20)
8. Draft Final Report & UDOT Workshop (month 23)
9. Final Report (month 24)

### **Project Cost:**

Total Project Costs: \$61,230

MPC Funds Requested: \$24,578

Matching Funds: \$36,652

Source of Matching Funds: Utah DOT

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