



Project Summary

Texas Department of Transportation

0-5079: Use of Traveler Information to Enhance Toll Road Operations

Background

Traffic on toll facilities is initially low, and grows slowly over time as motorists become aware of the time savings and other advantages of choosing a tolled alternative. Increasing traffic on toll roads could provide two benefits: reduced congestion on non-tolled roads, and improved toll road financial feasibility. Evaluation of the effect of traveler information on toll road choice was the primary objective of this study. Four issues were explored:

- What traveler information would help users choose a toll road
- Operational effects on the non-tolled network
- Potential increase in toll road revenues
- Technical and financial considerations for deployment

What the Researchers Did

To accomplish the project objectives, the research team completed the following tasks in a two-year schedule:

- **Synthesize state-of-the-art traveler information deployment:** The research team conducted a comprehensive literature review. The results were synthesized in a technical memorandum with recommendations on message design and deployment technology.
- **Survey travelers to determine effect of information on route choice:** Researchers conducted a survey of commuters in Austin, Texas. Questions included: commuting patterns, kinds of traveler information desired (e.g., accidents, expected delay, alternate routes), preferred technology, likelihood of choosing a toll road, and demographic information (e.g., zip code, income, gender). Responses were received from 706 commuters.
- **Analyze potential users, types of information desired, possible sources, delivery technology:** The survey data was analyzed to determine the types of information that motorists seek, including timing, location/ frequency in relation to trip length, and routing decisions.
- **Conduct case study and demonstration for selected network:** In this task a simulation case study was conducted on the transportation network of Austin, Texas, using the DYNASMART-P model. The research team coded the SH 130 and SH 45 segments into the Austin network and simulated traffic volumes, travel speeds, impacts on safety, air quality, etc., with and without traveler information. The results were translated into an estimation of benefits to both the tolled and non-tolled system.
- **Analyze technology, cost, potential sources of funding, implementation issues:** The benefits and costs, implementation issues, technologies, funding opportunities, and potential business models for deployment of various traveler information technologies were investigated.

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What They Found

Potential users of traveler information are characterized by high income and education, frequent driving in congested areas, and technological savvy. Customers of toll roads tend to have similar characteristics. Therefore, use of traveler information to encourage toll road use is a natural convergence.

The Austin commuter survey found that there is increasing preference for in-vehicle technologies such as cell phones, satellite radio, and on-board displays to receive traveler information.

The simulation case study for Austin, Texas, indicated that the impact of traveler information on toll road choice is positive and would improve the entire network performance. The average trip distance increased slightly, mainly because of route switching. However, the average travel time and stopped time in the entire network decreased.

With the provision of traveler information, the traffic volumes on toll road links would increase by as much as 110% in some segments, and by about 50% on average, with potentially similar improvements in toll revenue. The investigation of benefits and costs found that the deployments assumed in the simulation case study are cost-effective, with a benefit-cost ratio of 4.84.

What This Means

Some of the recommendations resulting from this study are listed here:

- It was shown that dynamic traffic assignment tools such as DYNASMART are effective for evaluating traffic operations under various scenarios. Texas Department of Transportation (TxDOT) staff should be provided with training to use such tools.
- It was found that about 50% of commuters are willing to pay to receive the benefits of traveler information. However, the direct market for traveler information is still immature. TxDOT can play a leading role in moving the market forward by partnering with toll road developers to deploy traveler information systems.
- Traveler information delivery technology is rapidly evolving toward on-board audio-video systems. The Vehicle Infrastructure Initiative (VII) will develop two-way communications, providing continuous information to traffic management centers and feedback to motorists. TxDOT should explore funding opportunities to conduct VII test deployments.

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