0-6907: Communicating Information for Traveling on Managed Lane Networks

Background

Managed lane networks are complex, interconnected facilities that require advancements in traveler information to successfully serve the users of those facilities. Historically, managed lanes were typically developed for single, distinct corridors, providing preferential access for users who travel from one endpoint to another. The success of past managed lane projects has led to planned and constructed networks of managed lanes that expand the concept across most major freeways within a region. Currently, operators rely mostly on signage, websites, and social media to convey information related to pricing and operating rules. Figure 1 shows an example of the complex signage currently used in Dallas. Existing communication methods will become ineffective as network complexity increases. New technology, including advancements in traveler information and connected vehicles, may provide a solution to the problem. This research project investigated different operational and pricing rules for managed lane networks.

What the Researchers Did

Key parts of this research consisted of:

- A national state-of-the-practice review.
- System user focus groups and surveys.
- An emerging technologies assessment.

The state-of-the-practice review detailed seven regional case studies where managed lane traveler information systems were applied and currently operating. Focus groups and travel surveys constituted the human factors assessment for the research. The research team

Figure 1. Southbound I-35 Sign Bridge for I-635 LBJ and 35E TEXpress in Dallas.

conducted a series of focus groups throughout Texas, totaling 32 participants from four focus groups. The survey asked a larger respondent pool about frequent trip purpose, pre-planning activities, navigational tools, and barriers for accessing information. The survey opened for

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responses for six weeks from February to March 2017. Survey recruitment occurred through a variety of methods including outreach to traditional media (e.g., radio stations and newspapers) and web-based social media. A concluding technology assessment interviewed third-party mapping providers and proposed improvements to existing managed lane traveler information systems.

What They Found

The state-of-the-practice review found that managed lane networks across the United States tended to vary considerably in the type of pricing structure, number of priced destinations on signs, and availability of online toll information. The pricing structure provides definition for assessing toll charges, whether through single gantries or destination-based systems. Many toll facilities in Texas operate using a single-point gantry system that does not require a back office calculation to assess a charge based off of an origin-destination pair. Operators within the Seattle, Washington, and San Francisco, California, regions recently developed online data feeds that provide real-time toll and operating information to third-party entities.

A travel survey of 866 Texas-based respondents found that drivers prioritize information about traffic incidents and lane closures over toll price data (94 and 88 percent versus 41 percent, respectively). More respondents wanted to view travel time and incident alerts on in-vehicle devices, compared to a higher demand for destination and toll information on roadway signs. Most respondents indicated using smartphone applications and mapping websites for pre-trip planning purposes (79 and 65 percent, respectively) compared to television and radio reports (13 percent). Comparatively, prior research published five years earlier found that radio was a highly influential media for influencing behavior.

What This Means

Researchers recommend a pathway for agencies to share essential data with third-party entities, based off the general transit feed specification (GTFS) used for transit. A GTFS-based approach limits the operating agency to principally managing the outflow of critical data, while not endorsing a specific medium that can easily change relevance. A key implementation challenge is the coordination between agencies to agree upon a common framework for providing both static and dynamic information. Agencies might consider the relative basic elements of priced managed lane data as a precursor for developing platforms to support automated and connected vehicle applications.

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