

0-6688: Evaluation of the I-10 Katy Freeway Managed Lanes

Background

The Katy Freeway Managed Lanes (KML) represent the first operational, multilane managed facility in Texas and provide an opportunity to benefit from the lessons learned from the project. The facility is located in the western portion of I-10 between SH 6 and I-610 West (see Figure 1). This study evaluated multiple aspects of the KML and the critical areas of project development, design, and operation.

What the Researchers Did

The research team:

- Gathered background information on the history and development of the I-10 KML.
- Documented the operational conditions on the KML and analyzed traffic volume and travel times over time.
- Examined crash records for the KML to quantify safety before, during, and after the implementation of the managed lane facility on I-10 in west Houston.
- Examined the operation of the Katy Freeway Managed Lanes as it pertains to enforcement before and after the implementation of the managed lanes.
- Interviewed maintenance supervisors to gather information on their activities and costs related to the KML operations.
- Examined the public's use of the managed lane facility in terms of both the number and percentage of Katy Freeway trips taken on the facility, and the conditions contributing to managed lane use.
- Investigated the performance of access points and whether the design of access to managed lanes is meeting the needs of motorists who use them.

What They Found

Researchers collected and analyzed data about the KML, and had numerous findings, including the following:

- Travel time savings are approximately 5 minutes in the morning and 14 minutes in the afternoon in the peak directions, and the travel time advantage over

the general purpose lanes (GPLs) has increased as volumes have grown.

- Over 1.5 million different transponders were observed on the Katy Freeway in 2011; 68 percent of those only used the GPLs. Of the remaining half million who used the managed lanes, over 80 percent used them for 60 or fewer trips during the entire year, which averaged slightly over one trip on the managed lanes per week. Approximately 11 percent used the managed lanes for more than two trips per week. A small percentage of just over 3 percent use the managed lanes for all their trips on the Katy Freeway.
- According to the user survey, 49 percent of the managed lane users change their usual freeway access point in order to reach the managed lanes.
- A safety analysis of the corridor shows that the improved geometric design and reduction in congestion had a positive effect on reducing crashes, which dropped from 128.3 crashes per million vehicle-miles before construction to 57.3 crashes per million vehicle-miles after the project opened.
- Most sections of the KML were built to have ideal conditions for optimal separation between concurrent-flow lanes, using a wide 20-foot buffer and plastic delineators. Because of the wide buffer, pylon hits and replacements have been low compared to other managed lane projects (25 percent replaced per year).

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Project Completed:

4-30-2013

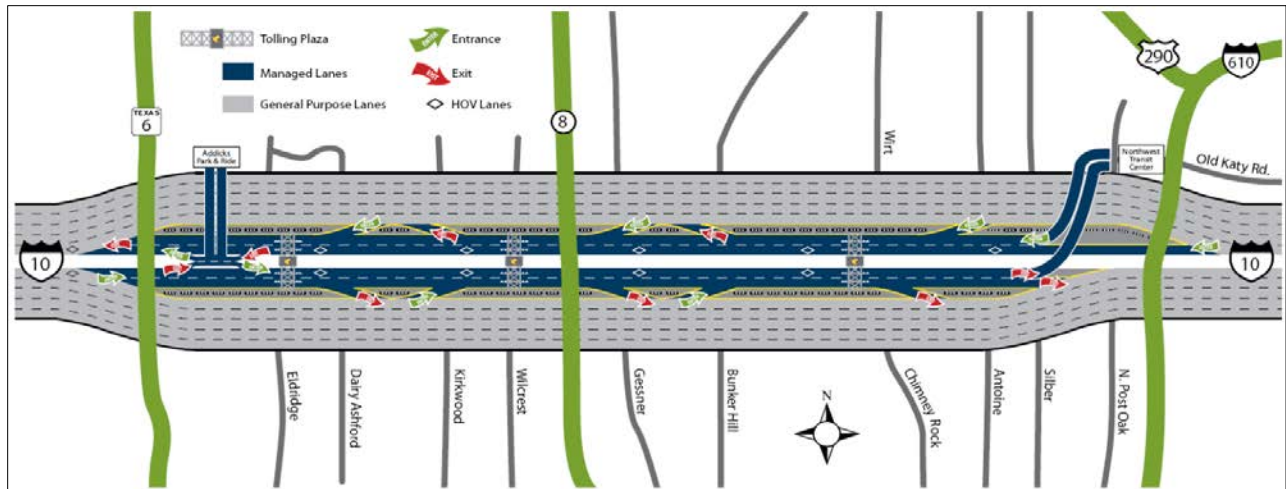


Figure 1. Katy Freeway.

- All agencies interviewed agree that active enforcement of lane use and having the physical space to conduct enforcement activities are beneficial elements in reducing maintenance and operational issues.
- Managed lane volumes have doubled compared to pre-opening usage, and isolated sections of congestion have emerged on the GPLs despite the increase in general-purpose capacity provided by the freeway expansion.
- Most travelers using the managed lanes estimated travel time savings that were more than twice the actual time saved.
- The KML have a variety of access types, including at-grade slip ramps and direct connect ramps. The design of the studied access points was found to be sufficient to handle the expected demand of drivers entering and exiting the lanes.
- Within the environment under which the Katy corridor was developed, multiple agencies and political leadership coalesced and applied available best practices for facility design and operation to achieve the project goals.
- Flexibility and focus on the outcome were factors identified by many of the agency partners as keys to successful implementation of the project.
- Continual monitoring and adjustment of operating aspects of new managed lanes are required post-opening, especially during the ramp-up period in which drivers make travel adjustments to use the facility. The operating partners for the KML have continuously monitored the performance of the lanes since opening and have made adjustments in toll rates, lane configuration at the tolling zones, and access operations at the western terminus. These adjustments are critical to ensuring that the performance standards for the lanes are maintained.
- Additional research in the following areas can give a more complete picture of the impact of the KML to the corridor and region: motorist understanding of freeway signing, effects on the environment, variations in transit and ridesharing, impacts on economic development, and changes in land use.

What This Means

Researchers learned:

- Based on the measures studied, the project is achieving its stated goals and is operating in a safe and effective manner.

For More Information

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Keyword: Research