



Project Summary

Texas Department of Transportation

0-5284: Feasibility and Guidelines for Applying Managed Lane Strategies to Ramps

Background

Managed lanes operational strategies can maximize existing capacity, manage demand, offer choices, improve safety, and generate revenue. The key to successfully operating managed lanes is the ability to alter the operations of the lanes in ways that keep traffic flowing. That ability to alter operations provides flexibility not only in the day-to-day operations of the lanes but in situations where isolated incidents, such as major accidents, call for the lanes to be open to more or different user groups. One of the areas for potentially improving overall freeway performance is at ramp locations. Current ramp treatments address only point demand. The concept of managed ramps would be to apply any of the myriad of managed lanes operational strategies along a corridor to optimize the use of the overall freeway facility. The goal of this research was to help the Texas Department of Transportation (TxDOT) assess under what conditions managed ramps should be considered, to assess the impacts and benefits of managed ramps, and to develop general guidelines and best practices for operating managed ramps.

What the Researchers Did

To achieve the project goal, researchers:

- Identified candidate managed lanes operational strategies for ramp application assessment.
- Conducted an extensive and exhaustive review of current practice and related research on the operations of managed lanes as well as traditional ramp management strategies in areas throughout the country.
- Analyzed through modeling the selected operational strategies based on user groups and corridor factors.
- Conducted focus group sessions to get input from Texas drivers regarding key issues of managed lanes and the application of managed treatments to ramp operations.
- Developed a decision matrix that leads the user through the decision process to identify the most appropriate strategy(ies) for particular corridors depending on various issues.
- Identified other issues that may impact the implementation of managed lanes operational strategies to ramps.
- Developed guidelines for TxDOT with a methodology to assess and identify the appropriate managed lanes operational strategies for ramp applications for a particular region.

Research Performed by:

Texas Transportation Institute (TTI),
The Texas A&M University System

The University of Texas at El Paso (UTEP)

Research Supervisor:

Beverly T. Kuhn, TTI

Researchers:

Kevin Balke, TTI

Nadeem Chaudhary, TTI

Debbie Jasek, TTI

Ganesh Karkee, TTI

Kwaku Obeng-Boampong, TTI

Jeffrey Shelton, TTI

Steven Venglar, TTI

Ruey Long (Kelvin) Cheu, UTEP

Project Completed:

8-31-07

What They Found

The research showed that managing ramps under certain conditions using different operational scenarios has the potential to improve freeway operations. Metering the demand on higher-volume ramps allows operators to maintain a higher level of operating speed and throughput on freeways, indicating that limiting ramp access to select user groups to enhance flow balance is a feasible ramp management strategy. Also, venue-destined vehicle restrictions and total ramp closure are two managed ramp strategies for special event management that have the most potential to improve freeway operations. In terms of providing managed ramp preference for vehicles destined for a managed lanes facility, only those conditions with speed differentials of less than 10 mph are considered desirable and viable. Finally, automobile restrictions and total ramp closure are two managed ramp strategies for ramp safety that have the most potential to improve freeway operations.

What This Means

Through targeted managed ramp applications, TxDOT has the potential of providing improved freeway operations under specific conditions. By assessing the potential operational benefits of a managed ramp scenario in conjunction with addressing other critical issues – such as public and agency input, pricing as an option, decision-making needs and traffic control devices, enforcement, environmental justice, evaluation and monitoring, interoperability, and outreach and marketing – TxDOT has the opportunity to improve the optimization of the freeway facility as it is impacted by ramp operations.



HOV Access Ramp

For More Information:

Research Engineer - Wade Odell, TxDOT, 512-465-7403
Project Director - Michael Chacon, TxDOT, 512-416-3120
Research Supervisor - Beverly T. Kuhn, TTI, 979-862-3558

Technical reports when published are available at:
<http://library.ctr.utexas.edu/index.html>

www.txdot.gov
keyword: research



Research and Technology
Implementation Office
P.O. Box 5080
Austin, Texas 78763-5080
512-465-7403

This research was performed in cooperation with the Texas Department of Transportation and the Federal Highway Administration. The contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the FHWA or TxDOT. This report does not constitute a standard, specification, or regulation, nor is it intended for construction, bidding, or permit purposes. Trade names were used solely for information and not for product endorsement.