

Fall 2002

# FAST LANE

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## Welcome to FastLane

This is the fifth edition of *FastLane*: a quarterly newsletter that highlights ongoing activities and research in managed lanes in Texas. This issue features articles on the ramp simulation, recent legislation research, as well as highlights of news items on managed lanes. *FastLane* archives can be found on our web site, <http://managed-lanes.tamu.edu>. Please feel free to forward this newsletter to anyone who might be interested in its contents, and as always, we welcome your comments and suggestions.

## Research Team Out in Front

Our project team has been busy this quarter wrapping up a number of tasks and informing others about the work going on in Texas. Beverly Kuhn was invited to speak on the Managed Lane Concept at the Texas 2002 Transportation Summit in Irving, Texas on 14 August 2002. Also, Ginger Daniels Goodin and Beverly Kuhn presented recent research results at the first meeting of the Managed Lanes External Stakeholder Committee on 24 September 2002 in Austin, Texas. Both of these presentation and many others are available on our website, <http://managed-lanes.tamu.edu>, under "Our Products."



**Beverly Kuhn**

## Managed Lanes On the Web

The Managed Lanes project team has published three Project Bulletins to summarize various tasks we have completed to date. They are available online in Adobe Acrobat format and include:

- Project Bulletin 4160-1B: Managed Lanes Symposium <http://managed-lanes.tamu.edu/products/bulletins/4160-1B.pdf>,
- Project Bulletin 4160-5B: Developing a Managed Lanes Position Paper for a Policy Maker Audience <http://managed-lanes.tamu.edu/products/bulletins/4160-5B.pdf>, and
- Project Bulletin 4160-6B: Developing a Managed Lanes Position Paper for a Media Audience <http://managed-lanes.tamu.edu/products/bulletins/4160-6B.pdf>.

These bulletins are brief and give an excellent overview of the research. As always, feel free to visit the "Reports" section of our website under "Our Products" to browse all of our products from this project to date. Several presentations from recent conferences and meetings that you might find of interest have also been added. Visit "Presentations" under "Our Products" as well to browse the list and access them in Adobe Acrobat format. If you have any questions, please don't hesitate to contact Beverly Kuhn at 979-862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

## The Managed Lanes List

A managed lanes listserv is available to interested readers. This list, unlike many other listservs, is not a discussion list. It is merely a means for the research team to disseminate information to members of the list in an efficient manner. This listserv is open to anyone interested in managed lanes topics or research. If you have concerns or questions about the list or would like to be added to the list, please contact Beverly Kuhn at [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).



## First Meeting of External Stakeholder Committee

The External Stakeholder Committee for the Managed Lanes Project met for the first time on 24 September 2002 in Austin, Texas. Thirty representatives from federal, state, regional, local, public, and private entities from across Texas, along with members from the research team, met to discuss the research project and identify critical issues that impact the stakeholders in managed lanes projects. Key topics discussed during the meeting included truck and other vehicle restrictions, traveler information and traffic control devices, incident management, mobility in urban areas, and access to managed lanes. Overall, the meeting was very successful and helped the research team fine-tune the research agenda to ensure that the concerns of these stakeholders are addressed throughout the project. This committee will meet annually until the completion of the project. The presentation given by the research staff at this meeting is available online at <http://managed-lanes.tamu.edu> under "Our Products."



had an 88 percent public support rating and that 60 percent of the carpool users were members of the same family, while 40 percent were co-workers.

## Managed Lanes — Simulation of Ramp Spacing and Percent Weaving

Simulation was used to obtain an appreciation of the effects of ramps spacing on freeway operations. Simulation of several ramp pairs can demonstrate the impact on the *corridor* of vehicles from different ramps consistently weaving across free lanes to access or depart a managed lane facility.

Speed was the primary measure of effectiveness used to evaluate the effects of the different ramp spacing, volume levels, and weaving percentages. Ramp spacing of 1000, 2500, 4000, and 5500 ft was used. Freeway initial volumes of 1250, 1500, 1750, and 2000 vehicles per hour per lane were also used. Finally, the percentage of freeway entrance ramp traffic that desired to maneuver to the next managed lanes access point was varied between 0, 10, 20, and 30 percent of the traffic on the (source) freeway entrance ramp. The 0 percent weaving scenario provided a base line condition of how the freeway would operate without the managed lane facility. Figure 1 shows a diagram of the simulated freeway with a parallel managed lane facility. Also depicted are the speed data collection points used in the simulation.

Key findings from the simulation include the following:

- In the simulation, ramp spacing only affected average freeway speeds when the initial freeway volumes were very high (2000 vehicles/hour/lane) and ramp spacing was at the lowest value used in the simulation (1000 ft).
- Figure 2 shows an example of the average freeway speed by entrance ramp volume for the 20 percent weaving condition. In each weaving level comparison, the average freeway speed dropped faster for the shorter ramp spacing (look especially at the almost vertical line representing the data for the 1000 ft spacing scenario as compared to the other spacing scenarios). This shows that operations are more sensitive to small increases in traffic volumes when ramp spacing is shorter.
- The number of vehicles attempting to weave across the four freeway lanes to enter the managed lanes can have a pronounced impact on the operations of the freeway.

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## Managed Lanes in the News

### I-25 Value Pricing Pilot Program Scheduled

An item in the Federal Highway Administration weekly report for September 30, 2002, states that the Colorado Department of Transportation has received \$1.7 million in federal funds to assist in the conversion of existing HOV lanes on I-25 in Denver to a high-occupancy toll facility. The converted facility will use value pricing as a congestion management tool to make capacity available to single-occupant vehicles and still ensure that HOV users will not be adversely affected. FHWA and FTA jointly funded the construction of the existing HOV facility and have succeeded in resolving the respective agencies' legal, technical, and policy issues. NEPA evaluation and project development are expected to begin this month. no schedule has been proposed for the timing of the conversion.

### Carpool Lanes a Success in Los Angeles County

Los Angeles County is the home to a 420-mile system of carpool lanes, the largest carpool system in the nation. A recent *Los Angeles Times* article reported that the system is popular with the public and works well enough that the Metropolitan Transportation Authority (MTA) plans to add 250 more miles in the next decade. A study conducted by the MTA found that the special lanes cut travel time for most carpoolers, encouraged ride-sharing, and helped to reduce smog. The study which included a survey of more than 3,000 residents, found the carpool lanes

## Managed Lanes — Simulation of Ramp Spacing and Percent Weaving

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With the exception of short spacing in combination with high initial freeway volumes, the average freeway speeds recorded from the simulation runs are generally above 45 mph until approximately 500 vehicles per hour are attempting to weave across the freeway and enter the managed lanes. When the lowest freeway speed recorded is reviewed, the point when less than desirable operations occur is at approximately 250 veh/hr.

- The review of the simulation findings for the average and low entrance ramp speeds revealed that average entrance weave speeds below 45 mph occur when approximately 300 veh/hr are attempting to weave. Low entrance weave speeds below 45 mph occur at lower volumes, at about 250 veh/hr.

Previous research has stated that a direct connect ramp should be considered when ramp volume is 400 veh/hr. The findings from this simulation support that number. When considering average speeds, the number is about 500 veh/hr for the freeway traffic and about 300 veh/hr for the entrance weaving traffic. Using this simulation, a value of 400 veh/hr could be a reflection of a rounded value that gives consideration for both average freeway speeds and average entrance vehicle speeds. If the preference is to consider lowest speeds observed (a more conservative situation), then a direct connect ramp should be considered at 275 veh/hr.

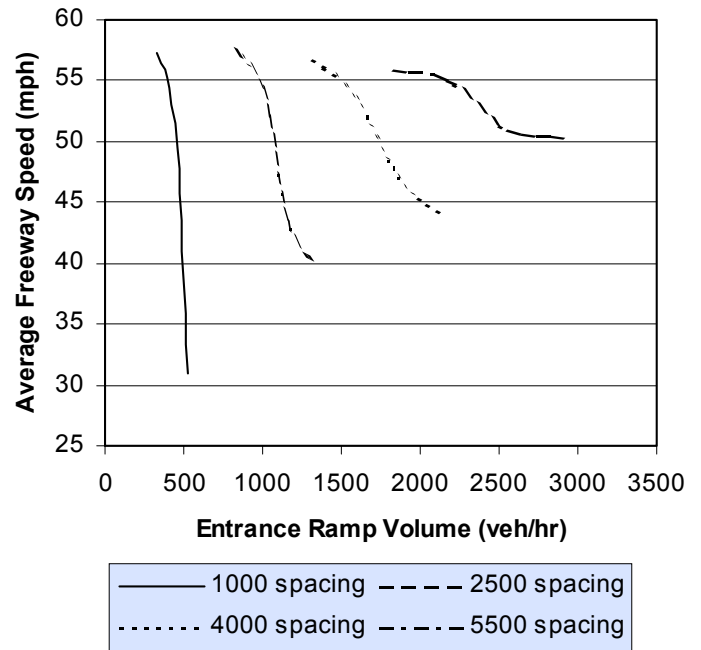


Figure 2. Average Freeway Speeds for 20 Percent Weaving

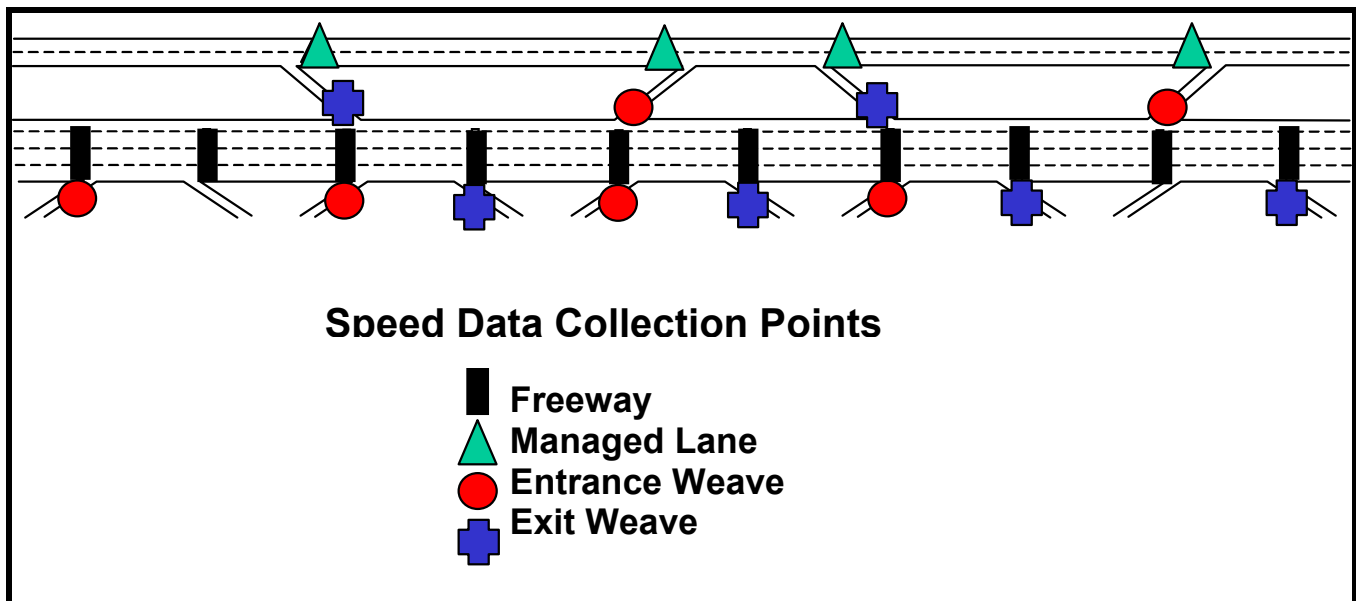


Figure 1. Simulated Freeway Facility with Parallel Managed Lanes

## Managed Lanes —Legislation in Texas

One of the efforts of the research project undertaken last year was the task on legislation. The goal of this task was to identify key legislative changes necessary to facilitate the various managed lane operational strategies with respect to design, operation, enforcement, and other key issues governing their use in Texas. Researchers compiled a summary of all legislation in existence in Texas that has an impact on the legality of operational strategies for managed lanes. Those operational strategies addressed in this task included HOV lanes, value-priced and HOT lanes, exclusive lanes, separation and bypass lanes, dual facilities, and lane restrictions. Researchers also investigated enforcement and operational flexibility but did not focus on legislation associated with funding and financing managed lanes, which was addressed in a separate task. They then assessed the laws and statutes to identify gaps in the legal code or statutes that, when filled, can provide TxDOT with the authorization to operate the complete gamut of managed lane scenarios while providing flexibility for operational changes as deemed necessary by the department.

Legislation currently in place in Texas provides for the operation of certain managed lanes scenarios. However, in some instances, the legislation is limited or non-existent. Table 1 provides a list of the managed lane operational scenarios along with the Texas codes that govern them needing changes as recommended by the research team. While the changes recommended are not numerous, they are critical to the long-term success of managed lanes in Texas.

The premise of the managed lanes concept is to increase freeway efficiency and provide free-flow operations for certain freeway users by packaging various operational and design strategies. The strategies deployed offer the flexibility to adjust operations to match changing corridor and regional goals. Numerous federal and state laws govern the operations of these facilities in Texas. However, some gaps exist that prevent TxDOT and other operational agencies from having the complete arsenal of options available to design, operate, and enforce managed lanes under a variety of control scenarios and make operational and eligibility changes over time as conditions change. At the federal level, FHWA does not provide permanence to HOT lanes. At the state level, several gaps exist. The researchers recommend the following changes to remedy these gaps:

- Define managed lanes as an operational concept in Texas and authorize entities to develop these facilities for congestion mitigation purposes;
- Allow entities operational flexibility with managed lane facilities;

- Authorize entities to develop exclusive lane facilities for congestion mitigation purposes;
- Authorize TxDOT to establish lane restrictions for congestion mitigation purposes and remove the time-of-day limitation on the current municipal authorization for this strategy; and
- Make unlawful the violation of any managed lane facility in Texas punishable by fine.

Incorporating these recommended changes into the Texas statutes broadens the powers of TxDOT and other transportation organizations and provides them with the tools they need to successfully implement managed lane facilities in their jurisdictions in the most effective manner, thereby working to reduce congestion and enhance the mobility of Texans.

**Table 1. Recommended Texas Legislation Changes and Additions**

Managed Lane Categories or Additions	Operational Scenario	Principal Governing State Regulation Needing Changes
Managed Lanes	All	TTC <sup>1,3</sup>
HOV	All	Sec.224.153 (a) TTC
Exclusive	Truck	TTC <sup>3</sup>
Separation/Bypass	Truck	TTC <sup>3</sup>
Lane Restrictions	State	Sec.201.901 (a) TTC Sec. 621.006 TTC
	Municipality	Sec.545.0651 TTC
Managed Lane Violation	State	Sec.224.155 TTC
Enforcement	State	TGC <sup>2</sup>
Operational Changes	All	TTC <sup>3</sup>

<sup>1</sup>Texas Transportation Code

<sup>2</sup>Texas Government Code

<sup>3</sup>No Specific Regulation Currently Exists, New Regulation Needed