

# Managed Lanes

*The future of freeway travel*

The Katy Freeway — Houston. LBJ and Central Expressway — Dallas. IH35 — San Antonio. Loop 1 and IH35 — Austin. They are a few among the many major freeway systems in Texas that are experiencing tremendous growth. Over the last ten years, in an attempt to combat the enormous increase in traffic demands, transportation professionals have been struggling to find new and innovative ways to make them operate more efficiently and handle this growth.

While adding lanes seems like a logical solution, making



**A comprehensive Managed Lanes Manual for TxDOT engineers will cover how to plan, design and operate a managed lanes facility.**

something bigger isn't always better. Today, construction costs, land consumption, neighborhood impacts and other environmental issues are major concerns in developed urban areas and often necessitate practical limits on freeway expansion projects. Adding high-occupancy vehicle (HOV) lanes or other special-use lanes is generally a viable option and does improve traffic flow at certain times of the day. But how can we maximize the effectiveness of those lanes throughout the entire day? How can we encourage travelers to use the lanes when it would best benefit them? Who should use the lanes and when? How can different vehicle groups be permitted access to the lanes on a real-time basis without creating congestion? How do we communicate the rules on usage and make sure travelers follow them? What

technologies could enhance the operation of the lanes, as well as the overall traffic flow of the entire freeway system?

These are some of the questions being addressed by a cross-disciplinary team of Texas Transportation Institute (TTI) researchers working on a multi-year effort to assist the Texas Department of Transportation (TxDOT) in optimizing the performance of freeway managed lane facilities. The project entitled Operating Freeways with Managed Lanes is a joint effort with Texas Southern University (TSU) and involves 24 tasks designed to investigate all of the issues surrounding the use of managed lanes in an urban area. The key product to emerge will be a comprehensive Managed Lanes Manual for TxDOT engineers. The manual will cover how to plan, design and operate a managed lanes facility, as well as adapt that facility to meet the changing mobility needs of a region over time.

"We're addressing very complex issues," says Beverly Kuhn, a TTI research supervisor heading the project. "Making a managed lane facility really work effectively involves multiple areas — planning, design, operations, Intelligent Transportation Systems (ITS), enforcement and safety. Everything is interrelated, and everything has an effect." The user group of a lane may drive the geometric design, which will influence the signs and markings and involve numerous safety issues. Multiple user groups may drive operations decisions and ITS needs.

According to Gary Trietsch, Houston district engineer for TxDOT, "flexibility is an important factor in optimizing mobility for targeted users of the managed lanes." For instance, if an incident occurs on the freeway main lanes, and opening the managed lane to another user group during that time would improve traffic flow, then traffic engineers need to be able make the switch, and

there needs to be a way to smoothly implement the change. "We plan to provide a multi-dimensional decision matrix that will show how to incorporate flexibility into a facility to allow that to happen."

In the first year, the research team is producing a thorough review of current practice and state-of-the-practice literature. In addition, a symposium held in February in Austin was very successful with over 90 professionals from across the state attending the one-day event featuring experts from Texas and around the country. "We wanted to begin generating a dialogue between all the potential partners, as well as provide insight into managed lanes operations," says Ginger Daniels, the TTI co-research supervisor for the project.

Other tasks that are underway include the use of simulation technology to analyze operational scenarios based on user groups, development of a concept marketing strategy and recommendations for geometric design of managed lanes. The project team is also hosting a web site (<http://managed-lanes.tamu.edu>) and publishing a quarterly newsletter to document lessons learned as the research progresses.

Carlos Lopez, director of traffic operations for TxDOT and project director for the managed lanes project, believes that "the results from this project will be of great benefit to TxDOT in handling the ever-increasing challenge of providing efficient transportation systems and serving the mobility needs of Texans in the future."



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