

Some like it HOT

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By Edward Regan III*

The irony of rush hour is that everyone is in a hurry, but nobody moves. As a result, local leaders often find themselves tied in knots searching for ways to relieve expressway congestion and to eliminate the aggravation of driving in urban areas.

Better management of some traffic lanes is one option to relieve the problem. Managed lanes, also known as high-occupancy toll (HOT) lanes, restrict the use of some freeway lanes to those drivers who pay to use them.

HOT lanes are similar in purpose to high-occupancy vehicle (HOV) lanes, which encourage ridesharing by restricting use to vehicles with more than one passenger. With HOT lanes, though, such free-flow lanes can be made available to all motorists. For example, vehicles carrying sufficient numbers of passengers still could use the HOV lanes for free, but those same lanes would serve as HOT lanes when vehicles with a single occupant pay variable tolls to travel in them.

Tolls for HOT lanes are assessed exclusively through electronic toll collection systems without traditional toll plazas or the need to stop vehicles. Toll rates can vary by time and travel direction based on congestion levels.

The HOT lane concept generally emerged from the success of the SR 91 Express Lanes project — which opened in 1995 in Orange County, Calif., — where approximately 30,000 vehicles each weekday pay up to \$5.00 to use the express lanes that replaced the median of a congested urban freeway. SR 91 generates sufficient revenue each year to cover operating costs and repay the cost of constructing the express lanes. By providing two travel options, the new lanes also greatly reduced travel times for users.

I-15 gets HOT

Seeing the success in Orange County, San Diego County converted an eight-mile reversible HOV roadway on I-15 to a HOT operation five years ago. Prior to the conversion, I-15 HOV express lanes had been in operation in San Diego for many years but were limited to vehicles with two or more occupants and transit vehicles. Located north of downtown San Diego, reversible HOV lanes had operated southbound in the morning and northbound in the afternoon and evening. Because the lanes were not crowded after accommodating HOV users, the region tried a pilot program in 1998 to make those same lanes HOT to allow toll-paying, single-occupant vehicles (SOV) to use them.

The project was implemented and operated through the San Diego Association of Governments (SanDAG), the regional Metropolitan Planning Organization and the California Department of Transportation. It was funded through the Federal Highway Administration Value Pricing Pilot Program and state money.

Because the state required that SOVs not degrade operations for HOV lane's primary users — carpools — SanDAG used dynamic variable pricing for SOVs. With the method, toll rates are displayed on variable message signs at each entry point and can change up to every six minutes based on traffic levels in the express lanes. As total traffic levels for HOV/HOT lanes approach pre-determined thresholds, toll rates are automatically increased to discourage SOV use. Tolls typically range from less than \$1.00 to \$4.00 for the eight-mile trip, and they occasionally are higher during congested conditions or when incidents may affect capacity.

The SanDAG project has been well received by the public and the local politicians, and there has been no evidence of decreased carpool use. In fact, HOV use of the lanes has increased more than SOV use during the HOT operation period. On a typical weekday, SOVs represent about 20 percent of the traffic in the express lanes vs. 80 percent HOVs.

The project generates about \$2 million annually. After covering operating costs of about \$1 million, the net revenue is used to subsidize new express bus operations along I-15, creating new transportation alternatives for commuters in the corridor.

SanDAG's project will be continued indefinitely. In fact, the managed lanes are being extended to a total of 20 miles and ultimately will be expanded to four-lane, two-directional operation. The extended lanes will include direct access to four park-and-ride bus rapid transit (BRT) stations, providing more opportunities to reduce congestion.

Public support

As part of the planning for the expansion program, a telephone survey about the current express lanes operation was conducted. The survey included 800 participants, all of whom used the I-15 corridor north of San Diego.

More than 90 percent of the respondents said it was a good idea to have a "time savings alternative" on I-15. At the same time, 88 percent of the express lanes' users said that allowing SOVs to pay to use the lanes was a good idea. More importantly, 66 percent of other users of I-15 (those who do not use the express lanes) also approved of the concept. More than 90 percent of express-lane users thought allowing SOVs to use the HOV lanes reduced congestion, and 73 percent of those who used the non-express lanes said it reduced congestion for them as well.

Critics of managed lanes have questioned the fairness of the concept. More than 75 percent of survey respondents, however, said allowing SOVs to pay to use the HOV lanes was fair.

When asked about the optimum solution for solving congestion on other portions of I-15, about half of express-lane users preferred extending the toll lanes — about twice as many as those who suggested adding additional general-purpose, toll-free lanes. Extending the express lanes also was the top choice of non-users, although by a lower margin.

Managed lane expansion

Houston also is integrating managed lanes into its freeway expansion program. Four price-managed lanes will be included in a major reconstruction and expansion of Houston's IH-10.

The managed lanes, which are expected to be in operation by 2010, will replace a single-lane, reversible HOV roadway that is heavily used by express buses. The Texas Department of Transportation and the Harris County Toll Road Authority (HCTRA) are funding the project.

HCTRA, which operates a number of Houston-area tollways, is contributing \$250 million to the improvement program and will operate the 10-mile, managed-lane portion. The authority will be repaid from net toll revenues.

HCTRA guarantees that the lanes always will be priced to ensure free-flow travel conditions in both directions even during peak hours. Express buses can use the managed lanes toll free, while vehicles with three or more occupants can use the lanes toll free only during peak hours.

Houston's IH-10 project represents an innovative concept in transportation finance and joint use between transit and motor vehicle traffic. Because the lanes are guaranteed to be freely flowing, the managed lanes essentially will function as a "virtual" busway, which will be shared with and paid for by passenger-car motorists. Motorists will be paying tolls to shorten their driving times.

A large scale managed-lane project is being planned in Dallas over the next decade: 21 miles with up to three new travel lanes in each direction (portions of which will be in tunnels). The project will include direct connections to five intermodal transfer points, including three light rail park-and-ride facilities.

Managed lanes and BRT

The experience in San Diego, and the planned improvements in Houston and Dallas, demonstrate the value of integrating managed lanes and BRT operations into a new form of high-quality transportation for both motorists and transit users. Value pricing to manage demand and generate revenue is the key element of successful managed-lanes projects. Through pricing, managed lanes can be kept freely flowing to preserve a time-savings alternative for HOVs, toll-paying motorists and for BRT operations.

Revenue from managed lanes also can benefit both highway and transit users. In San Diego, where HOV lanes already existed, net revenue from HOT users is being used to subsidize new transit services in the I-15 corridor. In Houston, revenue will be used to construct the managed lanes, which also will provide a high-speed corridor for express bus operations.

Orange County, San Diego, Houston and Dallas are the trailblazers in developing the managed-lane concept. At least two other communities — Minneapolis and Seattle — currently are planning to convert HOVs into HOV/HOTs. Using a simple, pay-as-you-drive idea, those cities may be on the way to improving their local traffic conditions.

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