



Florida Department of Transportation Research

Managed Lane Operations – Adjusted Time of Day Pricing vs. Near-Real Time Dynamic Pricing

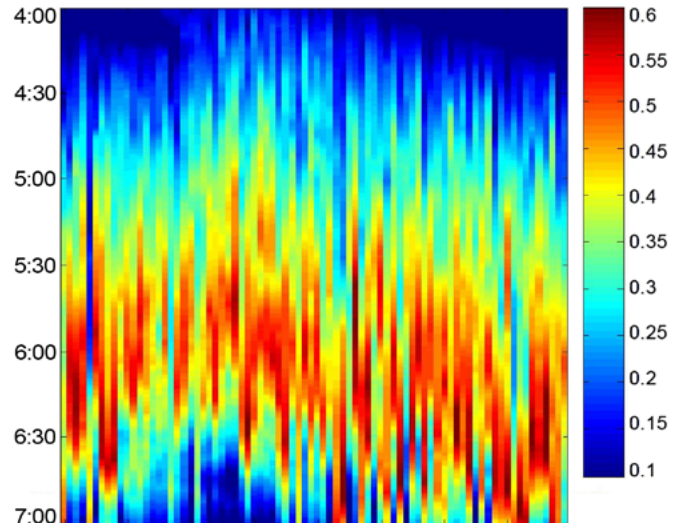
BDK77 977-04

In 2008, the Florida Department of Transportation began implementing the 95 Express, a segment of I-95 in Miami with high occupancy toll (HOT) lanes. Some vehicles use HOT lanes free, but most vehicles pay a toll based on real-time traffic conditions. HOT lanes reduce congestion by separating high occupancy vehicles from single-occupant vehicles or separating long-distance travelers from those using the highway within a few exits. HOT lanes contribute to increased mobility by moving people in high occupancy vehicles and bus rapid transit, while allowing the additional managed lane capacity to be fully utilized by single-occupant vehicle customers willing to pay a toll.

In this study, researchers from the University of Florida examined a toll-setting strategy called dynamic pricing, which updates tolls on restricted lanes based on the traffic density. This method is responsive to actual conditions, compared to time-of-day pricing. Researchers looked at two issues: how drivers adjust departure times and lane choices to cope with tolls and whether dynamic pricing offers an advantage over time-of-day pricing.

The researchers found that little work had been done on the effect of dynamic pricing on managed lanes. Therefore, they took a simulation approach to the question, finding that, if the travel demand pattern is predictable or stable, time-of-day and dynamic pricing worked equally well. Given that traffic demand tends to fluctuate, dynamic pricing proved to be more robust, as it was stable in both typical and high demand regimes.

In a second phase of the study, researchers examined the effect of certain features of the 95 Express on capacity and operations. 95 Express HOT lanes were formed by separating them from the general purpose lanes with a series of plastic poles and reducing lane widths from 12 to 11 feet. A detailed examination of capacity before and after implementation of 95 Express was



Travel time on the 95 Express HOT lanes during the afternoon rush hour for a 100-day period. The times vary from 0.1 hr (dark blue) to 0.6 hr (dark red).

conducted. Data collected revealed no substantial impact on capacity due to lane widths, but the proximity of the plastic delineators reduced utilization of the adjacent general purpose lane.

In the third phase of the study, the researchers focused on enhancements to the dynamic toll algorithm currently in use on the single segment 95 Express. At the heart of the toll system is a table that shows how traffic density changes from one time interval to the next. The researchers proposed a new approach to fine-tuning this table. Researchers also looked ahead, recommending toll methods for when the 95 Express is extended to a multisegment facility.