Florida Department of Transportation Research

Impact of Transportation Demand Management (TDM) Elements on Managed Lane Toll Prices

April 2015

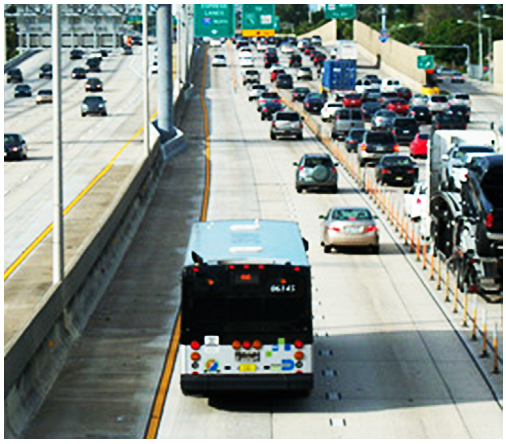
Project Number
BDV26-977-02

Project Manager
Marjorie Hilaire
FDOT Public Transportation Office

Principal Investigator
Brian Pessaro
University of South Florida

Current Situation

The 95 Express in Miami, Florida, is a set of dynamically tolled, managed lanes on I-95. Single occupant vehicles must pay a toll to use 95 Express, but registered carpools, vanpools, motorcycles, inherently low emission vehicles (ILEV; generally, hybrids), and transit buses are exempt from tolls. Transit and transportation demand management are critical to the effectiveness of these lanes, increasing both throughput and traffic flow.



An express bus shares the 95 Express managed lanes with a number of cars.

Research Objectives

The project goal was to demonstrate the impact of transit and transportation demand management (TDM) on the operation of the 95 Express and adjoining general purpose lanes.

Project Activities

In this project, University of South Florida researchers at the National Center for Transit Research (NCTR) compared observed traffic and toll data from 95 Express for the April 8-10, 2014, with simulated traffic and toll data under a scenario which had no toll exemptions or express bus service.

Researchers collected traffic and toll data for the three-day period into 15-minute increments for both the express and general purpose lanes in both directions. Data included average speed, volume, and level of service, average toll amount in express lanes, number of transit riders, number of registered high occupancy vehicles (HOVs), and number of registered ILEVs.

In preparation for data analysis, researchers surveyed 95 Express bus riders, registered carpoolers and vanpoolers, and registered ILEV owners, asking how they would travel if there was no express bus service or toll exemption. Survey results were used in the test scenario to adjust field traffic volumes in the express and general purpose lanes. Changes in volumes led to changes in speeds, traffic densities, and for express lanes, changes in toll amounts.

Comparison of field data with scenario data showed a mild impact on managed lanes, but significant effects on general purpose lanes. A surprising result was the important role that ILEVs play in reducing congestion on general purpose lanes; however, ILEV toll exemptions are being phased out because exempting the increasing numbers of ILEVs (often single occupant) undermines the ability of variable pricing to regulate traffic volumes on managed lanes and reduces revenues needed to develop the lanes.

Project Benefits

The project showed that transit and TDM activities benefit travelers in managed lanes and in general purpose lanes, especially the latter. Project results both advance expertise in managing express lanes and reinforce the value of these lanes for roadway efficiency.

For more information, please see dot.state.fl.us/research-center