



Project Number

BDV30-977-01

Project Manager

Gina Bonyani
FDOT Planning Office

Principal Investigator

Ren Moses
Florida State University

Florida Department of Transportation Research

Twenty-Four-Hour Peaking Relationship to Level of Service and Other Measures of Effectiveness

August 2015

Current Situation

Increasing congestion on urban roads has placed demands on planners to find solutions that are within budget restrictions and that acknowledge physical restraints on possible expansions. For planning purposes, traffic engineers have focused on summary statistics, such as level of service and annual average daily traffic, at peak usage hours. Lack of knowledge of roadway performance during non-peak hours limits the insight and scope of planning operations.



Congestion – a sight that Florida drivers are facing increasingly and that planners are working to overcome.

Research Objectives

Florida State University researchers used historical traffic data to develop various roadway performance measures for both peak and non-peak hours.

Project Activities

Traffic data was analyzed according to four area types – rural, urban, urbanized, and large urbanized – and eight facility types – freeways and expressways, divided arterials, undivided arterials, collectors, one-way facilities, ramps, toll roads, and HOV lanes. Speed limits on these facilities ranged from 30 to 70 mph in five-mph increments. This may seem wide-ranging, but carefully analyzing as many variables as possible on monitored roadways provides a more accurate basis for traffic models in predicting the behavior of roadways that are not actively monitored.

For this project, data collected by telemetered traffic monitoring sites (TTMS) from 1996 to 2012 were used to determine 24-hour variation and peaking characteristics. The 2010 National Household Travel Survey, which provided information on recent travel patterns and trip-making behavior in areas of interest, was also an important additional source of data. Researchers concentrated on large urbanized areas, including Jacksonville, Miami-Fort Lauderdale-Pompano Beach, Orlando-Kissimmee, and Tampa-St. Petersburg-Clearwater. Descriptive statistics, such as minimum hourly flow, maximum hourly flow, coefficient of variation, standard deviation, and 99th percentile, were computed to capture the 24-hour volume peaking characteristics by speed limit and facility type.

TTMS data were further analyzed using a variety of models to characterize hourly volume variations. Statistics developed through the use of models included peak volume, typical weekday hourly volume, adjusted daily hourly volume, trip timing and travel behavior, elasticity parameters, and several others.

Project Benefits

The expanded view of roadway performance provided in this project gives planners new and more powerful tools for designing changes to existing roadways or planning new ones.

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