# Florida Department of Transportation Research

Multimodal and Corridor Applications of Travel Time Reliability
BDK77 977-10

Congestion is all too familiar in Florida's cities. Traditionally, agencies have tried to mitigate recurring congestion by comparing demand and capacity during peak periods and alleviating bottlenecks. However, congestion is often due to nonrecurring events, such as crashes, work zones, and adverse weather conditions. These factors can be accounted for in a broader view of facility performance called travel time reliability. This approach has an added advantage because it is also a very important measure of a highway traveler's perception of system performance.

The Florida Department of Transportation (FDOT) has funded several projects to develop travel time reliability tools for Florida road planners. With continuing research and development of this approach and wider adoption, the need has arisen to extend these tools. Researchers from the University of Florida were contracted to perform three needed tasks. First, the tools used in the FDOT project selection process were enhanced for use in annual reporting required by the Florida Legislature. Researchers also examined how to apply travel time reliability beyond the expressway system to signalized arterial and multimodal components of Florida's Strategic Intermodal System (SIS).

Several enhancements were made to the travel time reliability tools. Additional performance measures, Travel Time Index (TTI) and Planning Time Index (PTI), were incorporated. TTI is the ratio of peak-period travel time to free-flow travel time. PTI is a similar but more general measure that compares the 95% average travel time at any time period of interest to the free-flow travel time. The researchers also enhanced the portion of the travel time reliability tool that considers weather impacts. This more complex task increased accuracy by expanding the rainfall regimes from two to three, more accurately reflecting south Florida conditions, and considering multiple years of rainfall data.

*Weather and work zones are nonrecurring events that can be added to travel time reliability models for greater accuracy.*

The next task undertaken by the researchers was to develop a method for estimating arterial travel time. The method was developed based on simulated data, using the CORSIM microsimulator. From the very large number of possible factors on which to base calculations, nine were selected because of their potential effect on travel time and their availability to analysts in Florida. Two models were developed using results from a total of 1200 scenarios: one model for noncongested scenarios and another for congested scenarios.

Lastly, the researchers proposed a conceptual framework for conducting multimodal travel time reliability analysis. Methods were developed to estimate travel time and travel time reliability separately for each mode. Comparisons across modes were feasible as long as the travel time definitions were consistent across modes and the travel times were estimated in a consistent manner. To estimate travel times and travel time reliability using multiple modes, it was necessary to consider the entire trip including the interconnections between modes.

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