



Florida Department of Transportation Research

Travel Time Reliability Modeling for Florida

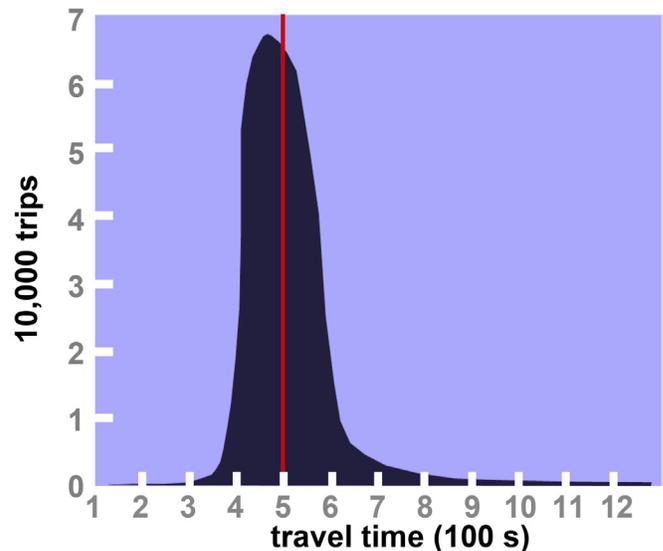
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Florida's Strategic Intermodal System (SIS) is a network of high-priority facilities across all large-scale transportation modes, ranging from the spaceport, through important airports, seaports, and rail systems, to buses and highways. SIS is critical to Florida's life and livelihood, and a critical measure of its efficiency and usefulness is travel time reliability (TTR). Understanding TTR means developing models that can accurately predict the flow of traffic in and across transportation modes. Such predictions can be important planning tools. However, measuring and quantifying TTR has proven to be a difficult task. Previous Florida Department of Transportation (FDOT) projects developed and implemented models for predicting TTR for freeways, using data from Philadelphia, PA, and Ft. Lauderdale, FL.

In this project, researchers refined previously developed TTR models to evaluate the impact of various Intelligent Transportation Systems (ITS) strategies on travel time reliability. Among the strategies considered were incident identification and removal policies, high-occupancy vehicle lanes, and work zone policies. Methods were suggested for incorporating the strategies into the existing TTR estimation method.

Following a description of the methodology for TTR estimation, the researchers described the SIS highway system segmentation process employed in the project. The basic segmentation unit is from one interchange to the next, with reporting aggregated to represent reasonable transportation system breaks and travel distances.

To extend the TTR estimation method from the highway segment for which it was developed to the entire SIS highway system required the availability of adequate data for all segments. Researchers determined that incident information could be obtained from the SunGuide reports, supplemented by data from the Crash Analysis Report System (CARS). The CARS database provided the probability of incidents per lane-mile



A travel time distribution accumulates thousands of trips times on a highway segment. The red line marks the median, indicating that most drivers can expect to spend 500 seconds on this segment.

for each hour of the day for a specific segment. Because CARS contains information about weather conditions and work zones, probabilities of incidents that occurred around these circumstances could be developed. The geometric information of the network, hourly demands, and expected frequency of congestion for each hour was derived from FDOT Roadway Characteristics Inventory (RCI) database.

TTR values were developed for the entire SIS highway system. The results were reasonable, but researchers found that additional refinements are needed, as the current process results in clusters of travel speeds around certain values, depending on the specific incident scenarios. Nevertheless, with the improvements to the TTR estimation method achieved in this project, it is now possible to take the next step and improve travel time distribution profiles through comparison with field data.

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For more information, visit <http://www.dot.state.fl.us/research-center>