



Florida Department of Transportation Research

Traffic Management Simulation Development

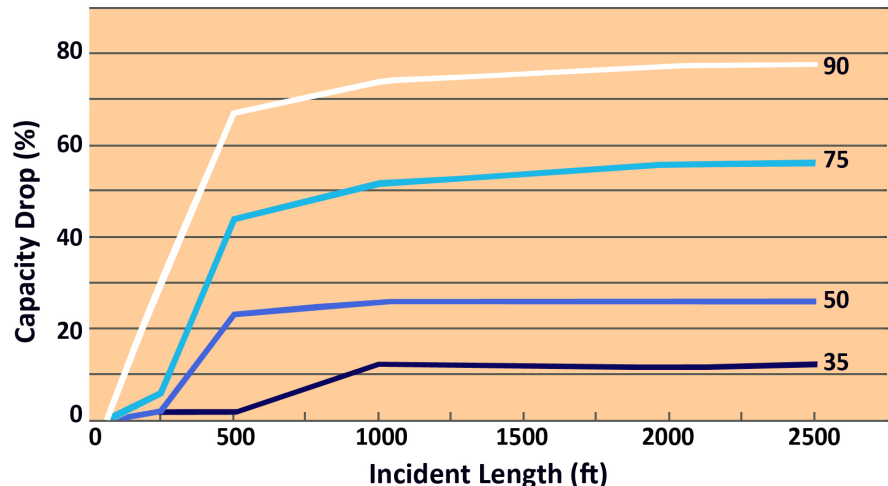
BDK80 977-03

Increasingly, Florida traffic is monitored electronically by components of the Intelligent Traffic System (ITS), which send data to regional traffic management centers and assist management of traffic flows and incident response using software called SunGuide. Data for SunGuide can also come from computer simulations, by which the system can be tested more efficiently and under a wider range of conditions than may be possible using real-world data.

Researchers from Florida International University developed software tools that interface with SunGuide and allow system testing using a technique called microscopic simulation. It requires more computer resources compared to other kinds of simulation, but it can simulate traffic in unique ways.

Reviewing research literature convinced the researchers that data from intelligent traffic systems (ITS) can provide cost-effective and detailed information for the development and calibration of simulation modeling applications. The procedures and tools developed use ITS data archives as sources for simulation data. The tools collect data from ITS archives, manipulate and aggregate the data, and automatically modify input files as needed by microscopic simulators. CORSIM was used for this study, but the methods developed can easily extend to use with other tools. Beyond testing, project tools can be used to estimate traffic parameters from ITS data archives for planning, travel demand forecasting, and traffic analysis purposes.

Two major software components resulted from this project. Referred to collectively as SunSim, the first component is a core simulation environment which supports development of models based on



This graph shows the effect incident length on capacity for four values of the rubberneck factor, the degree to which drivers slow when passing an incident. The study showed the importance of considering significant incident length in order to understand the impact of rubbernecking.

ITS data and user inputs. The second component is a set of simulators that allow the exchange of data between SunGuide and simulated detectors for use in the SunGuide subsystem testing and operation evaluation.

Other products of this study included procedures for the utilization of ITS data archives to support the use of simulation to calibrate simulation models for incident and no-incident conditions. The researchers examined the influence of a wide range of variables and developed guidance for how to best use simulations models in comparing incident and no-incident conditions.

Researchers designed several use cases to demonstrate SunSim in evaluating SunGuide software modules and algorithms. These use cases include software load test, travel time estimation based on point detectors, travel time estimation using AVI/LPR, incident alarm threshold procedure testing, and ITS data warehousing process testing.