



Florida Department of Transportation Research

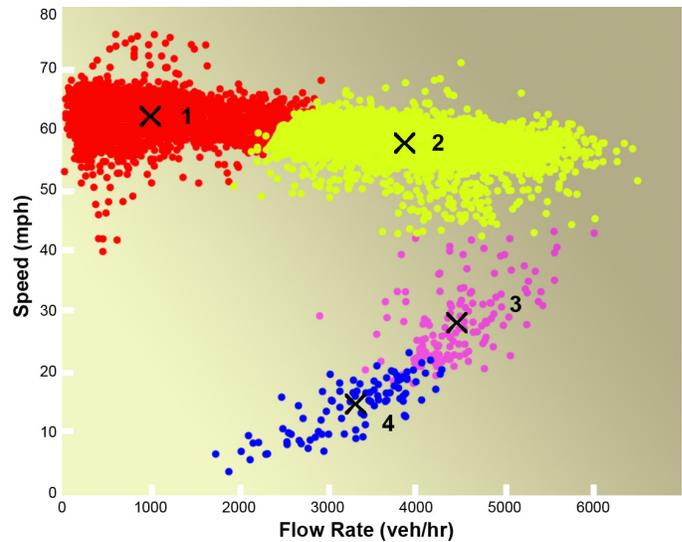
Decision Support Tools to Support the Operations of Traffic Management Centers (TMC)
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SunGuide is Intelligent Transportation Systems (ITS) software used by the Florida Department of Transportation (FDOT) at Traffic Management Centers (TMC) throughout Florida. ITS data collected by SunGuide supports both real-time and long-term decision making at the TMC. Researchers at Florida International University developed and tested several methods and software tools to support TMC operations, based on a needs assessment conducted with TMC staff.

Travel time estimation was high on the list of requirements. The accuracy and reliability of the estimation are affected by factors, such as congestion levels and incident conditions, detector configuration, detector errors, and estimation methods. As congestion increases, SunGuide travel time estimates become more important but less reliable. Researchers investigated improving the estimate accuracy for congested and incident conditions by combining SunGuide's current estimation methods with other methods. Researchers also recommended improvements to other aspects of SunGuide that negatively affect travel time estimates.

Communicating road conditions to travelers is an important TMC function. Success of such efforts is measured by diversion rate, and its estimation is used to recommend and evaluate diversion strategies. Estimating the percentage of travelers likely to divert allows for better prediction of impacts on the alternative routes and optimization of signal timings on the routes during incidents. Researchers developed a method to estimate traffic diversion based on the traffic detector and incident data. Their models revealed which factors most affected diversion rate: day/night, level of traffic demands, queuing delay, and queue length.

Critical to the TMCs is effective incident detection, measured by the time from incident occurrence to when the first incident management agency is notified of the incident. SunGuide does



Traffic detector data from the SunGuide system show the complex relationship between speed and flow rate in four regimes ranging from uncongested (1) to very congested (4).

not currently give accurate estimates of this time. Researchers developed a method to estimate the time from the occurrence of the incident until it is recorded in the SunGuide database based on a combination of detailed historical traffic detector and incident management databases.

Researchers also developed methods for other incident-related measures. They estimated secondary freeway crashes, and using both descriptive statistics and logistic regression analyses, identified contributory factors. Models and methods were also developed to estimate incident impacts, including number of lanes blocked, predicted incident duration, estimated queue length, average delay, and secondary incident probability.

The results of this study can increase SunGuide's usefulness in important ways, both as a real-time, incident management tool and for supporting the analysis of historical incident scenarios and optimizing future incident response.