Florida Department of Transportation Research

Demonstration of the Application of Traffic Management Center Decision Support Tools

BDK80 977-24

Among the most important advances in transportation systems in recent years has been the development and implementation of intelligent transportation systems (ITS), which relies on several means of monitoring traffic flows, coupled with real-time and delayed analysis, to allow detection of incidents, dissemination of traffic information through dynamic message signs (DMS) and 511 services, and support analysis of historical data to improve traffic flows and travel times. ITS functions are managed through regional transportation management centers (also called traffic management centers, TMC) in each of the Florida Department of Transportation's (FDOT) seven administrative districts.

A series of research projects conducted for FDOT have produced software tools to manage and analyze the large amounts of data delivered by the ITS to the TMCs. In this project, conducted by Florida International University researchers, some of these decision support tools were implemented at a TMC to demonstrate the benefits of the tools. The project focused on three decision support tools used for historical analysis, implemented the tools at the FDOT District 5 office, and applied the tools to the I-4 corridor.

The first tool demonstrated in the project was traffic pattern identification and performance measure estimation. This tool allows analysts to identify normal day traffic patterns and estimate corresponding mobility, safety and reliability performance measures. An important result of these analyses is identification of bottlenecks.

The second tool demonstrated was the incident impact estimation tool. Traffic incidents account for a significant amount of delay on major roadways, and this tool helps to analyze the impact of incidents on traffic operations in terms of queue length, incident delay, the potential for secondary incidents, energy and environmental impacts, and an incident severity index. The insight provided through analysis of incident data

The I-4 corridor is one of the most heavily traveled in Florida. Advanced traffic management tools can help managers ensure smooth traffic flows.

has one of the highest payoffs for transportation managers in terms of designing responses and managing incidents. This kind of information is critical for improving traffic flows and incident response on roadways affected by holiday and special event traffic.

The third tool demonstrated was playback of historical incident data for training and impact demonstration purposes. This tool allows a simulator to "play back" real-world data from incidents, which TMC operators can use to improve their operations during incident conditions. In addition, the researchers created an interface to display incident impacts in a time progression, which incident management teams can use to demonstrate the importance and effectiveness of specific incident management strategies.

The tools give planners powerful visualization tools to readily understand traffic flow patterns under normal and incident conditions. The visual nature makes them especially useful in explaining planning efforts to decision makers. Increasing and advanced use of ITS data promises smoother and more efficient traffic flows on Florida's busiest corridors.