Florida Department of Transportation Research

Manual on Performance of Traffic Signal Systems: Assessment of Operations and Maintenance

May 2017

Project Number
BDV27-977-05

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Current Situation

"Growth" has characterized Florida's population and economy for many decades. Assuring that Florida transportation keeps up with that growth, now and into the future, is the job of the Florida Department of Transportation (FDOT) and the state's city, county, and regional transportation agencies. Maintaining the efficiency of local transportation infrastructure requires appropriate traffic signal system designs that perform as intended. New housing, schools, or shopping can affect traffic patterns for a considerable distance. Currently, signal systems are analyzed in a qualitative process that may be overly subjective and misleading, causing traffic inefficiencies.

This intersection is near a major new shopping development. Evaluating and retiming the traffic signals throughout the network of roads in the vicinity is expensive and time-consuming work.

Research Objectives

In this project, Florida Atlantic University researchers developed a methodology and software tools that allow objective, quantitative analysis of the performance of signal systems.

Project Activities

The researchers surveyed the state of practice for traffic signal system evaluation through a literature review. Through the review, they documented and described the treatment of this subject in national and state reports, with a focus on where gaps exist and on opportunities to improve performance tracking of signal systems.

Insight gained from the literature review was refined through a two-step Florida-specific process. First, the researchers developed a questionnaire to learn about current practices in local agencies. The outline of the questionnaire followed the format of the National Traffic Signal Report Card plus a section to facilitate comparison of results gathered by qualitative methods. Second, the questionnaire was administered at the traffic divisions of Palm Beach County and the City of Boca Raton. Responses were supplemented with face-to-face interviews.

Based on the literature review and questionnaire/interview process, the researchers discussed the goals for the methodology they planned to develop with FDOT. Together, they decided that the methodology would allow evaluation of the annual performance of traffic management agencies and weekly or monthly evaluation of the performance on specific corridors.

The result was a set of Excel spreadsheets accessed through a dashboard interface and accompanied by a manual through which agencies can conduct a quantitative signal system evaluation. The methodology is intended to facilitate internal evaluation and interagency comparison in areas such as agency management, traffic signal operations, signal timing practices, traffic monitoring, data collection, and maintenance

Project Benefits

More objective evaluation of traffic signal management will help improve the efficiency of local road networks and help local agencies use limited funds more effectively. Better methods of analyzing signaling system performance on road networks are needed to provide more objective guidance and to better direct local funds.

For more information, please see www.fdot.gov/research/.