



TRAFFIC SIGNAL BRIEF

Tech Brief Series

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Automated Traffic Signal Performance Measures

Active monitoring of signalized intersections helps agencies solve problems before they become complaints



One quarter of the nation’s traffic fatalities and half of all injuries are attributed to issues occurring at intersections. Signal retiming can improve traffic safety and operations, but highway agencies typically retime traffic signals on a 3-to 5-year cycle. For most of the country’s 330,000 signals, citizen complaints are the primary measure of performance.

Now, there’s a better way to manage traffic signals. The Federal Highway Administration (FHWA) is promoting automated traffic signal performance measures (ATSPMs) in Every Day Counts round four (EDC-4) as a way to improve on traditional signal management. Agencies use sophisticated data from ATSPMs to manually retime signal lights.

“ATSPMs are effectively dashboards that direct specific actions,” said Eddie Curtis, FHWA traffic management specialist and a leader of the EDC-4 ATSPMs deployment team. “Adjustments range from timing updates that take minutes to more involved activities that could trigger design, operations, or maintenance projects.”

Using ATSPMs to enhance safety and customer service is generating interest across the country. Twenty states are developing implementation plans and learning more about this innovation. Sixteen states are demonstrating and assessing the technology. Georgia and Utah have made ATSPMs a standard practice.





Automated traffic signal performance measures enable agencies to collect data continuously and respond to issues faster.

Better Signal Management

“ATSPMs have changed everything about how signals are managed in Utah,” said Jamie Mackey, statewide signal engineer at the Utah Department of Transportation (UDOT). “We efficiently optimize signals without manual turning movement counts. The number of complaints we receive has been reduced drastically because we are automatically alerted to issues as soon as they begin. When we do receive complaints, we are able to respond much faster because of the troubleshooting we do through ATSPMs.”

Of the 2,085 signals in Utah, 88 percent have ATSPMs. UDOT operates 1,157 signals and 95 percent of those have ATSPMs. “We are currently developing version 4.2 of the UDOT ATSPM software,” said Mackey. “We’re adding a 15-minute aggregate database and reporting tool to facilitate long-range views of the data as well as corridor-level analysis.”

UDOT was introduced to ATSPMs by a team from the Indiana Department of Transportation and Purdue University at the 2012 Transportation Research Board Annual Meeting. “We began writing software to retrieve and store the data and generate charts,” said Mackey. “It has proven to be a great investment. We’ve found that ATSPMs provide tremendous insight. We have more information that allows us to accomplish more with the same resources.”



Improve Traffic Operations

In 2015, the City of Overland Park, KS, began using ATSPMs developed by UDOT after learning of the system in a webinar. “At the time, UDOT staff were gracious enough to install the system and get it up and running on a City server,” said Shawn Gotfredson, supervisory civil engineer for the City. Since then, the City has added all 181 traffic signals capable of collecting data to the system and plans to upgrade the remaining 85 signals to ATSPM-compatible controllers.

“The continuous collection of ATSPM data enables us to replace various manual processes of collecting traffic data,” said Gotfredson. “Reports and graphs from the ATSPM system allow us to quickly review the operation of signals during peak and off-peak periods. This has allowed us to proactively find operational issues and discover equipment issues before we get phone calls.”

ATSPM tools enabled the Georgia Department of Transportation (GDOT) to efficiently redirect vehicles and adjust signal timing after a fire and bridge collapse on I-85 in Atlanta last year. GDOT maintains 3,500 of the state’s 9,500 traffic signals. Of the GDOT-maintained signals, 3,109 are ATSPM-capable. With more than 88 percent of its signals reporting high-quality data, GDOT uses ATSPMs as its primary tool to improve operations and manage maintenance of its traffic signal network.

“Having eyes on the entirety of our large system has been pretty much impossible,” said Alan Davis, GDOT assistant state traffic engineer. “But with the introduction of ATSPMs, we have a snapshot of the health of our entire system and the ability to quickly diagnose and focus resources across the whole system.”



Learn More:

View an EDC-4 Innovative Spotlight video on ATSPMs at this link: https://www.youtube.com/watch?v=iFNvw_ZdVyk

View “Are Your Traffic Signals Ready for Automated Traffic Signal Performance Measures?” webinar at this link: <https://www.youtube.com/watch?v=MnS9fxljsIE&feature=youtu.be>

Download ATSPM software at FHWA’s Open Source Application Development portable at this link: <https://www.itsforge.net/>



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