



Manatee County's Expansion of TSMO Capabilities to Enhance Multimodal Safety and Operations

By Manatee County, FL

Benefits Statement

Manatee County maintains over 220 signals and operates 115 signals in the County. In the recent years, Manatee County has invested in expanding its TSMO capabilities. Manatee County has implemented Automated Traffic Signal Performance Measures (ATSPMs) and Adaptive Signal Control Technology (ASCT) to increase safety to travelers. Traveler information dissemination using a crowd sourced platform and website provides information and access to live CCTV camera feeds to citizens. Increasing safety for all traffic modes, with focus on most vulnerable users, Manatee County has included Rectangular Rapid Flashing Beacons (RRFBs) and Leading Pedestrian Interval (LPI) as part of standard design at major pedestrian crossings and selected signalized intersections.

In this case study you will learn:

1. How Automated Traffic Signal Performance Measures (ATSPMs) improve operations, safety and reduce costs.
2. About how including Rectangular Rapid Flashing Beacons (RRFBs) and Leading Pedestrian Interval (LPI) as part of standard design increases safety for pedestrians.
3. How monitoring ATSPMs helps facilitate proactive maintenance and saves on retiming costs.

BACKGROUND



Manatee County implemented an Advanced Traffic Management System (ATMS) county-wide in 2012, which included adding a new Regional Traffic Management Center (RTMC). As part of the implementation, the County created an ethernet communications network with over 114 miles of fiber optic cable, and various ATMS devices such as, CCTV cameras, MVDS detectors, and Bluetooth travel time detectors. According to the Bureau of Economic and Business Research (BEBR), Manatee County is expected to grow by 31% in the next 15 years and more than 60% by 2045. With limited resources and inherent capacity concerns, expansion of TSMO capabilities to provide enhanced system efficiency and multimodal safety is a key priority for the success of the region's economy and residents alike.

Manatee County maintains over 220 signals and operates 115 signals in the County. This number will only be greater as County's development and population is booming. In the recent years, County has invested in expanding its TSMO capabilities in the following areas:

1. Monitoring performance of County's traffic signals and corridors
2. Adaptive Signal Control Technology (ASCT) Implementation
3. Traveler information dissemination using crowd sourced platform and website
4. Increasing safety for all traffic modes, with focus on most vulnerable users

TSMO PLANNING, STRATEGIES AND DEPLOYMENT

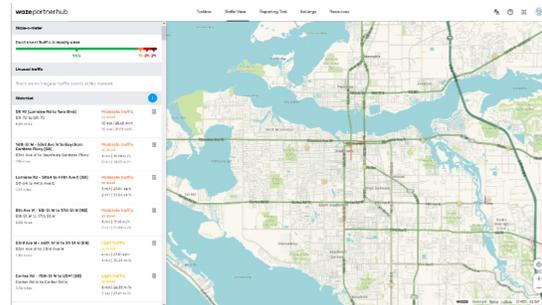
Monitoring performance of County's traffic signals and corridors

Manatee County maintains and operates 115

signals on the County corridors. Typically, these traffic signals are retimed on a 3-5 year cycle costing about \$10,000 per signal. Even though before and after travel time runs were performed to determine the effectiveness of the retiming effort, citizen complaints used to be a key measuring yard stick to determine the maintenance or operational deficiencies after the retiming effort. There was no means of data driven, real-time and continuous performance analysis or tools available to determine the performance of the signals. As part of an in-house project, 98% of all the signal controllers on Manatee County corridors were changed to Advance Traffic Controllers (ATCs). In early 2020, **Automated Traffic Signal Performance Measures** (ATSPMs) were deployed county-wide at seventy-five (75) signalized intersections.

Adaptive Signal Control Technology (ASCT) Implementation

In 2019, Manatee County implemented ASCT at 20 intersections through Federal Highway Administration's (FHWA's) Accelerated Innovation Deployment (AID) Demonstration grant of \$1 Million. In 2020 and 2021, the County has expanded the ASCT deployment at an additional 15 intersections along 2 different corridors.



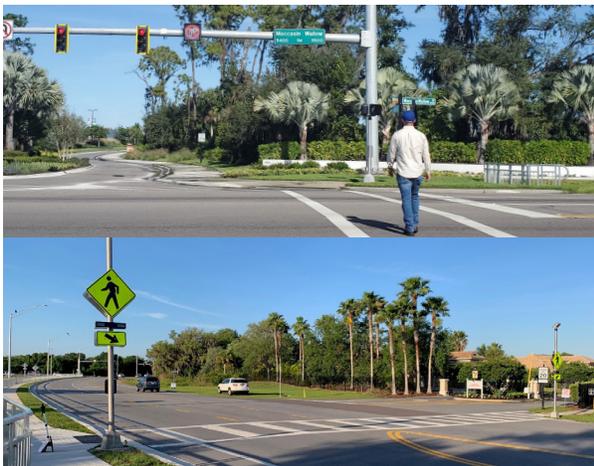
Traveler information dissemination using crowd sourced platform and website

In addition to ATSPMs, Manatee County entered into an agreement with Waze in 2019 for a two-way data exchange through the *Waze for Cities* program. Manatee County provides verified information on major incidents and planned/unplanned road closures to the Waze app (which is integrated into Google Maps as well), while receiv-

ing real-time information on travel time, congestion and incidents on the roads within the County. County has developed multiple interactive Power BI dashboards to visualize Waze crowdsourced travel-time data in near real-time with the capability to view and compare historical data. County also maintains a TMC website (www.smarttrafficinfo.org) providing access to live CCTV camera feeds to the citizens as well as a Twitter feed (@941_Traffic) to provide real-time information about planned and unplanned incidents.

Increasing safety for all traffic modes, with focus on most vulnerable users

With focus on safety of vulnerable road users, Manatee County has included Rectangular Rapid Flashing Beacons (RRFBs) and Leading Pedestrian Interval (LPI) (see pedestrian pictures) as part of our standard design at major pedestrian crossings and selected signalized intersections. We have currently deployed RRFBs at 39 locations which includes, mid-block crossings and roundabout locations. LPI is another operational and safety tool that County has implemented at intersections where significant conflict between turning vehicles and pedestrians is expected especially, at locations in the vicinity of a school. We have currently implemented LPI at 6 locations with additional 11 locations currently under implementation. As part of the LPI design, we are installing LED blank-out signs to improve driver yielding behavior and enhance safety for pedestrians and bicyclists.



COMMUNICATIONS PLANNING AND EXECUTION

Manatee County uses various sources and platforms to communicate with the public and to coordinate within and outside the agency. The goal is to spread the public awareness on ongoing and upcoming projects and its impacts on operations and safety. County uses its website portal to inform public of all ongoing and upcoming construction projects to help them make informed and planned decisions on their daily trips. The information on active road closures that impact roadway users are posted simultaneously on multiple sources, such as TMC website, Twitter feeds, Waze, and Public Service Announcements via Manatee County TV. Manatee County actively coordinates with the MPO and Florida Department of Transportation (FDOT) on a regular basis at TSMO stakeholder meetings and schedules other project coordination meetings with FDOT and local agencies to discuss projects of regional impact.

OUTCOME, LEARNINGS AND PUBLIC BENEFIT

ATSPMs - Improved Operations & Monitoring

Traditionally, agency engineering staff or professional consultants conduct retiming projects. After the implementation of new timings, they perform an ad hoc comparison of limited before and after travel-time data to demonstrate the effectiveness of optimization or retiming effort. Typically, these measures are travel time, number of stops, total delay etc. These traditional measures are performed once just after the retiming, and usually not repeated until the next retiming cycle. Also, these traditional measures do not provide actionable information or details of where the specific trouble spots exist, and their root cause. On the contrary, with the implementation of ATSPMs, Manatee County now has the capability to continually monitor performance of the signals using several performance metrics.

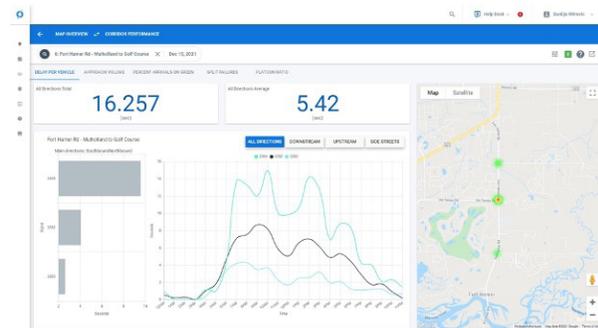
Targeted Maintenance

ATSPMs provide actionable information that

can be quickly verified and implemented. This helps the County to provide proactive solutions thereby delivering a higher level of customer service to the citizens. ATSPM provides daily “Insights” that offer information on possible hardware or timing issues causing interruptions or abnormal signal performance. These “Insights” are used to perform targeted maintenance or operational improvement.

Reduction in Costs

ATSPMs provide continuous traffic counts, both approach as well as Turning Movement Counts (TMCs), at every intersection. This significantly reduces traffic data collection costs for all ongoing and future retiming efforts. The signal systems can now be monitored actively, and timing changes can be implemented proactively, reducing expensive retiming projects once every three to five years. In 2012, Manatee County spent nearly \$900K for a complete county-wide retiming of signals (about \$10,000 per intersection). Including cost of operating the ATSPMs program and staff’s time to monitor and make timing changes, the annual retiming cost is now less than \$100K, which is at least 66% (2/3rd) reduction in costs.



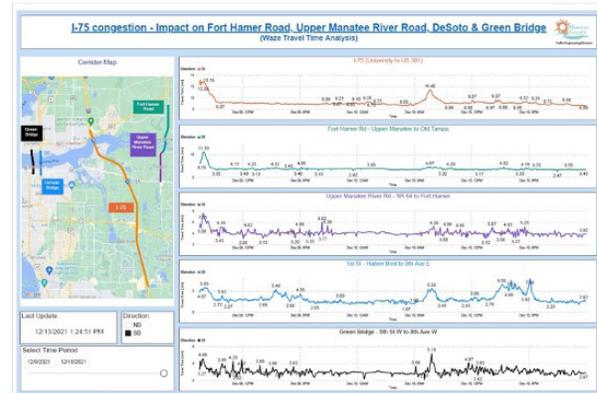
Adaptive Signal Control Technology (ASCT)

Since the project’s full implementation and operation in 2019, there has been a marked improvement in the overall operational performance, especially during the “shoulder” of the peak periods. The travel times after the ASCT implementation are generally lower by as much as nearly 20%.

Crowdsourced Data for Operations

The County’s participation in the *Waze for Cities*

program leverages the already popular crowd-sourced platform to disseminate important information to travelers and receive real-time data without investing in additional hardware. Manatee County has developed multiple interactive Power BI dashboards to visualize Waze crowdsourced travel-time data in near real-time with the capability to view and compare historical data. This is helping the County to continually monitor corridor performance and make decisions to enhance operations as needed.



RRFB & LPI

Manatee County has observed improved driver yielding behavior for pedestrians and bicyclists in the crosswalk with RRFBs. At LPI locations, we have installed overhead dynamic blank-out signs to enhance the conspicuity of turn restrictions, providing additional safety to the pedestrian and bicyclists. In field observations, these implementations have been well received by the citizens, school crossing guards, and the drivers were observed to obey the turning restrictions.