Pennsylvania Department of Transportation

PENNDOT TRAFFIC SIGNAL PROGRAM OVERVIEW

4 traffic signal program employees

14,000 traffic signals

40,000 miles of roadway

$28M traffic signal program budget

TRAFFIC SIGNAL SYSTEMS CAPABILITY MATURITY SELF ASSESSMENT

	Level 1 Ad-Hoc, High Risk	Level 2 Established, Risk Acknowledged	Level 3 Measured, Managed Risk	Level 4 Managed, Low Risk
Business Processes			✔	
Systems and Technology			✔	
Performance Measurement			✔	
Organization and Workforce			✔	
Culture			✔	
Collaboration			✔	

Traffic Signal Systems Capability Maturity Self-Evaluation Tool: https://ops.fhwa.dot.gov/tsmoframeworktool/tool/tssc/

ATSPM CAPABILITY

The Pennsylvania Department of Transportation's (PennDOT) automated traffic signal performance measure (ATSPM) program is statewide in scale. PennDOT has implemented ATSPMs where high-resolution controllers and field communications are available. PennDOT's ATSPM system allows users to analyze the following performance metrics:

- Approach delay
- Approach speed
- Approach volume
- Arrivals on red
- Coordination diagram
- Pedestrian delay

- Phase termination
- Preemption details
- Split failure
- Split monitor
- Turning movement counts
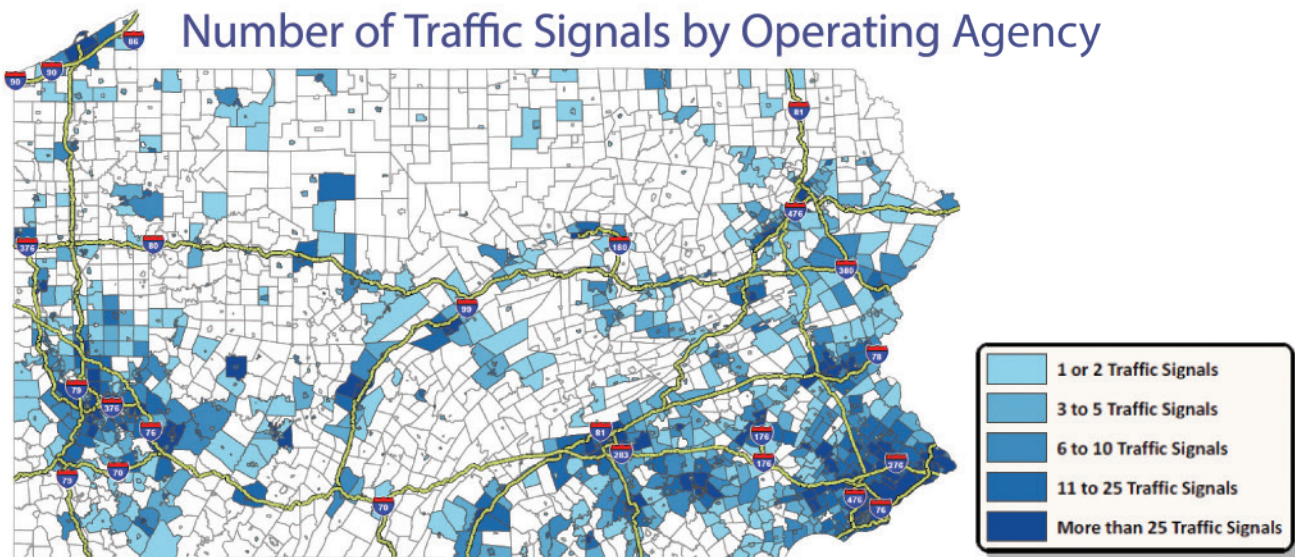
ATSPM IMPLEMENTATION

PennDOT's overall ATSPM goals include:

- Reducing delay, emissions, and fuel consumption.
- Reducing crashes and fatalities.
- Focusing impacts on the economy and job creation.

- Standardizing traffic signal equipment.
- Establishing regional and multi-jurisdictional collaboration.

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PennDOT uses open-source software developed by the Utah Department of Transportation for data storage and reporting. PennDOT uses a combination of modern signal controllers and vehicle detection systems to collect and archive high-resolution operational data with tenth-of-a-second timestamps. With communication from each signal to a central computer server, the data is stored and archived for analysis and reporting.

Future ATSPM plans include enhancement of PennDOT's unified statewide command and control software platform. The platform is needed because PennDOT connects with approximately 1,200 different signal owners and six different system software types, many of which are not compatible with newer systems. PennDOT's unified command and control integrates wide-ranging ATSPM inputs all in one platform.

Source: PennDOT, ATSPM Peer-to-Peer Presentation (January 23, 2018)

PennDOT is supplementing ATSPM to meet its delay, safety, emissions, economic, system standardization, and collaboration goals with corridor level probe data and performance management. Initial deployment of the probe data effort monitors 138 super-critical corridors, 2,184 traffic signals, and utilizes 776 arterial miles of INRIX data. Following initial deployment, PennDOT plans to expand implementation statewide and improve dashboard features. The probe data allows PennDOT to utilize the following tools:

- Travel Time Comparison Tool: Compares travel time distributions on a single corridor over different time periods.
- Arterial Ranking Tool: Ranks multiple corridors based on normalized median and interquartile travel times over the same time period.
- Congestion Ticker: Tracks speeds of corridors over time to identify time periods and locations of congestion.

ADDITIONAL RESOURCES

- To learn more, visit www.dot.state.pa.us/signals, https://signalmetrics.trafficwise.org/index.php, and https://ops.fhwa.dot.gov/arterial_mgmt/performance_measures.htm
- More information on Automated Traffic Signal Performance Measures is available on the Every Day Counts website at https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/atspm.cfm

For additional information please contact:

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Every Day Counts (EDC), a State-based initiative of FHWA's Center for Accelerating Innovation, works with State, local, and private sector partners to encourage the adoption of proven technologies and innovations aimed at shortening and enhancing project delivery.

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