

MAINTENANCE

ENHANCING TRANSPORTATION: CONNECTING TSMO AND MAINTENANCE

TSMO strategies help make road and bridge maintenance activities safer for workers and traffic and less disruptive to travelers by managing traffic during maintenance activities and alerting drivers to the presence of work crews and lane closures.

Maintenance is vital to preserving the mobility and safety of transportation facilities, but road work activities often temporarily disrupt mobility and constrain the available capacity of the system. By incorporating TSMO strategies into planned and unplanned maintenance activities and making use of existing TSMO resources, maintenance staff can alleviate some of the congestion caused by a temporary lane closure or other capacity reduction and increase safety for travelers and workers.

TSMO strategies that are helpful in increasing safety and mobility around maintenance activities include the following:

- Posting messages to variable message signs about maintenance work ahead enables drivers to be more alert as they drive by workers or to divert to another facility and avoid the work area. Operators at transportation management centers (TMCs) in the area are important partners in communicating alerts to travelers.
- Disseminating traveler information prior to maintenance activities alerts travelers to the time and location of traffic disruptions. By getting this information out early to potential travelers, departments of transportation (DOTs) can avoid or lessen demand on the facilities where maintenance work is occurring.
- Activating existing active traffic management strategies manages traffic on the facility dynamically. Examples include variable speed limits to smooth traffic flow and reduce collisions, dynamic shoulder use to add capacity when needed, queue warning systems to prevent incidents, and lane control to indicate which lanes are closed ahead.
- Coordinating with operators of potentially impacted jurisdictions to plan for and activate detours, signal timing, and ramp meter changes, or to change signal timing smooths the flow of traffic when maintenance work impacts lanes and traffic flow near intersections.



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Federal Highway Administration



Photo Source: Getty Images

■ WHAT IS TSMO?

Transportation systems management and operations (TSMO) is the use of strategies, technologies, mobility services, and programs to optimize the safety, mobility, and reliability of the existing and planned transportation system. A significant cause of congestion and unreliable travel is non-recurring events, such as crashes and transportation network disruptions, bad weather, and special events. TSMO enables agencies to target the underlying operational causes of congestion and unreliable travel through targeted solutions that typically cost much less and are quicker to implement than adding capacity. TSMO expands the range of mobility choices available to system users, including shared mobility and non-motorized options.

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This Fact Sheet is part of a series that explains how TSMO relates to other State and local transportation agency functions and offices. Other Fact Sheets focus on how TSMO relates to: asset management, performance management, design, safety, environment, planning, human resources, and construction.

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Maintenance and TSMO functions depend on each other during road weather events such as major snow storms or other adverse weather conditions. TSMO strategies for addressing adverse weather conditions on roads and bridges include systems that monitor road weather conditions and provide critical travel advisory information. This helps keep travelers off roadways that need to be cleared by maintenance personnel. Additionally, road weather information systems support maintenance decisions, and in turn, maintenance supports TSMO functions during weather events by providing information back to operators on the conditions of roads and bridges based on observations or detectors installed on maintenance vehicles. TMCs can then relay this information to travelers. Routine maintenance activities, such as shoulder repair, shoulder cutting and grading, and pipe cleaning, work to drain and keep water off the roadway surface and help minimize flooding due to excessive stormwater.

WHY IS MAINTENANCE IMPORTANT FOR TSMO?

Maintenance serves an important role in ensuring the effectiveness of TSMO strategies. Maintenance staff keep the physical assets or intelligent transportation systems (ITS) necessary for many TSMO functions in good operating condition. Assets such as traffic signals, ramp meter/count stations, closed-circuit television cameras, variable message signs, roadway weather information systems, and fiber-optic communications infrastructure must be repaired and replaced when necessary to enable the dissemination of traveler information and active traffic management. Maintenance staff should provide input to roadway design decisions that may impact their ability to access ITS devices and other TSMO-related equipment for maintenance. Maintenance staff should also provide input to the asset management of ITS devices to ensure that ITS devices are scheduled for maintenance and updated at appropriate frequency.

HOW HAS THIS WORKED IN PRACTICE?

- The **Ohio Department of Transportation (DOT)** encourages the use of TSMO strategies by highway maintenance forces to minimize traffic impacts. Strategies include coordinating road closures, communicating with TMCs, using driver alert information systems, and performing work during non-peak hours when possible.
- The **New Hampshire DOT** conducts an annual winter storm meeting to discuss how the State's TMC, road maintenance, and weather operations will coordinate operations during the winter months.
- The **Minnesota DOT** deployed a system that will automatically post messages on variable message signs to alert drivers to snow plows or maintenance vehicles when an equipped vehicle enters a pre-defined area. The system is used on a 34-mile stretch of I-94 and is intended to improve safety for snow/ice and other maintenance operations.¹
- The **Florida DOT** operations and maintenance personnel use an ITS Facility Management (ITSFM) system to manage daily maintenance needs including preventative maintenance, diagnostics, and asset management for ITS devices.²

1 Minnesota Department of Transportation, Work Zone Accident Reduction Deployment Evaluation (WZARDE), Web page. Available at: <https://www.dot.state.mn.us/its/projects/2016-2020/wzarde.html>.

2 Florida Department of Transportation, ITSFM Operations and Maintenance, Web page. Available at: <http://www.fdot.gov/traffic/itsfm/operations.shtml>.



FOR MORE INFORMATION

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