

# ASSET MANAGEMENT

## ENHANCING TRANSPORTATION: CONNECTING TSMO AND ASSET MANAGEMENT

The transportation industry is rapidly evolving with advanced technology and a new emphasis on management and operations. Roadways are becoming increasingly complex, with communications and security technology, sensors and cameras, and other technologies, as well as supporting infrastructure. Travelers and commercial vehicle operators rely on the software, hardware, and people necessary to dynamically manage and operate the system in real-time from virtual and physical transportation management centers. The reliance on transportation assets for TSMO is expected to rise steeply as transportation becomes increasingly automated.

Historically, agencies have prioritized technology deployment in support of TSMO, while maintenance has been an afterthought. With their significant investment in and focus on deploying technology, many agencies have been struggling to keep these assets maintained.

The industry needs a comprehensive approach to asset management that can support these emerging needs and lead transportation agencies into the future.

Asset Management is a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost.

Source: 23 U.S.C. 101(a)(2), MAP-21 § 1103.



U.S. Department of Transportation  
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, such as bad weather, and special events. TSMO enables agencies to target the underlying operational causes of congestion and unreliable travel through innovative solutions that typically cost 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: performance management, maintenance, design, safety, environment, planning, human resources, and construction.*  
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TSMO and asset management work toward enhancing system performance with similar processes, but they have different focuses. While asset management is concerned with preserving or improving the condition of assets, TSMO is focused on preserving and maximizing mobility. However, TSMO and asset management programs share a strategic, performance-based approach to monitoring performance and applying actions to reach targets.

Lifecycle planning and risk-based management are two concepts from asset management that hold promise for advancing TSMO programs. TSMO strategies often suffer from a lack of funding to maintain the technology and equipment required to operate the system after the initial deployment. Asset management uses a network-level lifecycle approach for managing assets over their whole life with a focus on minimizing cost while preserving or improving the asset condition. By adopting this approach for the assets supporting TSMO strategies, agencies would estimate the useful life of the technology and the need for upgrades and maintenance during the planning stages of the TSMO strategy, ensuring that there is an ongoing funding source for maintenance activities. Risk-based management as applied to TSMO would lead agencies to plan for, assess, and mitigate, avoid, or accept risks to mobility. For example, agencies could pre-position tow trucks to mitigate the risk of severe congestion caused by an incident in a work zone on a significant arterial in the region.

### INCLUSION OF TSMO IN TRANSPORTATION ASSET MANAGEMENT PLANS

The Federal transportation legislation, the Fixing America's Surface Transportation (FAST) Act, requires all State DOTs to develop risk-based Transportation Asset Management Plans (TAMPs) for the pavement and bridge assets on the National Highway System to improve or preserve the condition of the assets and the performance of the system.<sup>1</sup>

States are encouraged to add assets beyond pavement and bridges, such as ITS, traffic signals, and other infrastructure that support TSMO, to have a more comprehensive asset management system. States that choose to do so should include risk analyses, life-cycle planning, and condition targets and develop investment strategies based on funding available over a period of at least 10 years.

Including details such as field equipment make, model, serial numbers, purchase and installation dates, and routine device maintenance frequency allows for life-cycle costs to be analyzed and future device replacements to be planned and programmed. This would support agencies in replacing these assets on a more consistent and timely basis.

Many State DOTs are now developing TSMO plans. Given the links between TAMPs and TSMO plans, agencies may benefit from connecting both plans on a long-term basis.

### HOW HAS THIS WORKED IN PRACTICE?

**Caltrans** incorporates its ITS assets into an annual Asset Management Performance Report. The report tracks the performance or health of the agency's ITS assets and shows the projected performance or health of the ITS elements for the next 5 years. Caltrans sets a threshold to gauge the performance of its ITS assets and provides explanations and solutions to resolve potential ITS health issues.

### Five Core Questions for Transportation Asset Management that Apply to TSMO

- 1 What is the current state of physical assets?
- 2 What are the required levels of service and performance delivery?
- 3 Which assets are critical to sustained performance?
- 4 What are the best investment strategies for operations, maintenance, replacement, and improvement?
- 5 What is the best long-term funding strategy?

<sup>1</sup> 23 U.S.C. 119(e). For more information, see the Federal Highway Administration's Web page on Transportation Asset Management Plans at: <https://www.fhwa.dot.gov/asset/plans.cfm>. Also see the AASHTO Transportation Asset Management Portal at: <http://www.tam-portal.com/>.



#### FOR MORE INFORMATION

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