U.S. Department of Transportation
Federal Highway Administration

ENVIRONMENT

Enhancing Transportation:
CONNECTING TSMO AND ENVIRONMENT

Photo Source: Getty Images

TSMO can support environmental goals by reducing congestion, supporting multimodal solutions, and advancing strategies that increase mobility without the need to expand roads or undertake major construction. TSMO strategies support a multimodal approach to transportation, and focus on the movement of people and goods, and not solely on vehicles.

TSMO can benefit the environment by:

- Reducing fuel consumption and improving air quality, diminishing the environmentally damaging impacts of congested roads with stop-and-go traffic and long periods of idling.
- Improving transportation system efficiency. This helps accommodate travel demand within an existing roadway facility and reduces the need to build new lanes or facilities, which can result in environmental impacts to surrounding communities and increased traffic.
- Promoting the use of non-single-occupancy vehicle modes of travel.
- Coordinating quick and safe clean-up of incidents involving hazardous materials.

TSMO and environmental professionals all benefit when they collaborate on projects and other investments that advance these benefits. TSMO strategies promote environmental benefits in a variety of ways:

- Proactively managing traffic during incidents, special events, work zones, and poor weather conditions can lead to reduced emissions and an overall improvement in air quality. This management occurs through monitoring and prediction systems, traveler information dissemination, traffic control devices and plans, and other systems or tactics.
- Re-timing traffic signals or adaptive signal control technologies, can reduce fuel consumption by up to 7 percent and emissions by up to 6 percent.[1]

1 The Role of Transportation Systems Management & Operations in Supporting Livability and Sustainability: A Primer, FHWA, 2012. Available at https://ops.fhwa.dot.gov/publications/fhwahop12004/fhwahop12004.pdf.

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.

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, maintenance, design, safety, planning, human resources, and construction.

- Applying travel demand management strategies results in the efficient movement of people and goods and prioritizes environmentally friendly modes such as walking, cycling, ridesharing, public transit, and telework—especially under congested conditions.

The congestion management process conducted by metropolitan planning organizations (MPOs) provides an important connection between air quality and TSMO, especially in transportation management areas designated as ozone or carbon monoxide non-attainment areas.[2]

TSMO projects are often considered categorical exclusions in the **National Environmental Policy Act** environmental review process. This shortens review time and permits much quicker implementation than is possible with traditional expansion projects.[3]

The **Congestion Mitigation and Air Quality Improvement (CMAQ) Program**, administered by the **Federal Highway Administration**, provides funding to eligible surface transportation projects and other related efforts that contribute air quality improvements and provide congestion relief. TSMO projects can reduce emissions rates in many situations and are frequently eligible for CMAQ funding.

FHWA's INVEST (Infrastructure Voluntary Evaluation Sustainability Tool) is a web-based self-evaluation tool that helps transportation agencies assess and advance projects and programs that are economically, socially, and environmentally sustainable. TSMO investments can be evaluated within the Operations and Maintenance area of INVEST. Agencies receive points for putting in place operational strategies, integrating TSMO into design, and monitoring progress toward specific goals.

Source: FHWA, INVEST, Version 1.3 . Available at: https://www.sustainablehighways.org/.

HOW HAS THIS WORKED IN PRACTICE?

- A Smart Parking System pilot program in **San Francisco** (SFpark) from 2009 – 2013 decreased search time for parking by 43 percent. This reduction resulted in a corresponding 30-percent decrease in carbon dioxide (CO_2) emissions among vehicles searching for parking. The SFpark system provided drivers with real-time information about available parking spaces.[4]
- A typical signal timing project in **Portland** saves over 300 metric tons of CO_2 annually per retimed traffic signal.[5]
- Based on one U.S. model, each teleworker reduces CO_2 emissions by about 0.5 metric tons per year.[6] Teleworking is a TSMO strategy that reduces transportation system demand.

The goal of this fact sheet is for environmental and project development personnel to leverage TSMO strategies for environmental benefits and consider TSMO as a key tool in the toolbox of eco-friendly strategies.

2 23 CFR 450.322(e) and (f) - Congestion management process in transportation management areas. For more on the CMP see FHWA, Congestion Management Process Website. Available at: https://www.fhwa.dot.gov/planning/congestion_management_process/.

3 Federal Highway Administration, Environmental Review Toolkit, NEPA and Project Development Website. Available at: https://www.environment.fhwa.dot.gov/nepa/classes_of_action.aspx#ce.

4 Maroszek, M. SFpark Project Proves Smart Parking System Efficiency, GPS Business News, 2014. Available at: http://www.gpsbusinessnews.com/SFpark-Project-Proves-Smart-Parking-System-Efficiency_a5199.html.

5 Oregon Metro, 2010 Regional Transportation Systems Management and Operations Plan, June 2010. Available at: http://www.oregonmetro.gov/index.cfm/go/by.web/id=21962.

6 Reference Sourcebook for Reducing Greenhouse Gas Emissions from Transportation Sources, prepared under FHWA Project DTHF61-09-00117, FHWA, 2012.

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