TxDOT TSMO Program – From Planning to Implementation

By Texas Department of Transportation

9/14/2023

Benefits Statement

TxDOT's TSMO program is aimed at reducing road fatalities by 50% by 2035 and achieving zero fatalities on roadways by 2050. It will save lives by enhancing road safety, save time by improving traffic flow, and save money by optimizing transportation operations and cost-effective strategies. All facilitated through comprehensive training and communication efforts with various stakeholders.

In this case study you will learn:

1. How TxDOT aims to cut road fatalities by 50% and achieve zero fatalities on roadways by 2050 via their TSMO program.
2. How TxDOT employs structured approach for TSMO, focusing on planning, training, and early wins.
3. How TxDOT communicates TSMO benefits to the public and collaborates with stakeholders for success.

2023 TSMO Award Winner for Agency Improvement

NOCoE

Case Study #162

Version Number: 1

NOCoE

BACKGROUND

Texas has ten urban areas ranked in the top 20% congested areas in the US. It is forecasted to grow from 30 million to 45 million people by 2040, further increasing vehicle-miles travelled and congestion. Meanwhile, Texas experiences more than 4,000 roadway fatalities annually. In response, the Texas Transportation Commission adopted a formal goal "to achieve zero fatalities on roadways by 2050 and cut fatalities in half by 2035" and advanced their TSMO program as a contributing solution.

During 2016, TxDOT mandated inclusion of Traffic Management Systems (TMS) in construction projects. This mandate accelerated development of TxDOT's TSMO program, leveraging the initial version (2016) of the Statewide TSMO Strategic Plan. During 2021, TxDOT updated the plan and provided guidance to help districts develop customized plans, address their highest TSMO priorities, and meet transportation challenges unique to their district.

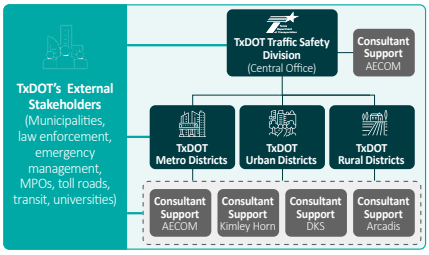
The combination of completed TSMO plans, and consultant support to implement these plans, sets TxDOT up for success in mainstreaming TSMO strategies and projects at every stage of project development from planning to design, construction, operations, and maintenance.

TSMO PLANNING, STRATEGIES AND DEPLOYMENT

TxDOT's TSMO Champions, Coordinators, and Consultants (Program Staff) applied the following process in implementing TSMO plans.

Leadership Engagement and Outreach:

TxDOT Transportation Systems Management and Operations (TSMO) Program Organization Chart



Program staff first obtained support from TxDOT Leadership to prepare TSMO plans. Through hundreds of meetings, they communicated the plans' objectives. A video was prepared for TxDOT staff, stakeholders, and the public to describe the value of TSMO and potential strategies.

Capability Maturity Model (CMM):

Program Staff conducted dozens of CMM workshops with TxDOT Division and District Staff and stakeholders to identify strengths, weaknesses, focus areas, and tactical plans.

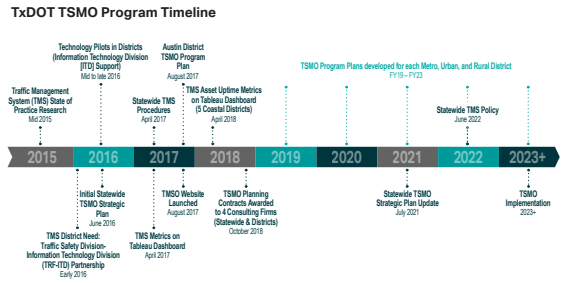
These CMM workshops provided a structured approach to baseline transportation operations today while providing guidance in developing TSMO plans to achieve future transportation performance goals and targets.

TSMO and ITS Implementation Plans:

Building upon the CMM workshops, program staff developed the Statewide TSMO Strategic Plan which provided a framework for the 25 metropolitan, urban, and rural districts to develop TSMO Program Plans to improve their

operations and management capabilities. In addition, 13 ITS Master Implementation Plans were prepared to identify, justify, and prioritize technology projects based on safety, congestion, cost data, and the need to fill gaps within the ITS infrastructure.

Program Plan Roll Out:



During meetings with TxDOT Leadership, program staff established deployment actions needed to support TSMO strategies as well as respective roles and responsibilities.

Together, they identified early wins, particularly for rural districts, who have largely just begun to implement TSMO strategies.

Implementation:

TxDOT Central Office developed a comprehensive set of tools and checklists to guide the implementation of TSMO projects by the districts. This includes a robust TSMO training program to support workforce development and strengthen staff's skills in deploying, managing, and operating TSMO systems and emerging technologies. This training contains 30 one-hour narrated modules, with video inserts, covering TSMO strategies, planning, implementation, operations, and maintenance. Several districts have since included deployment actions in tactical plans and implemented early win projects.

COMMUNICATIONS PLANNING AND EXECUTION

Program staff have informed and motivated TxDOT staff and stakeholders to embrace and mainstream TSMO as part of day-to-day operations through the communications strategies below.

Public:

TxDOT developed several means of communicating TSMO strategies and their benefits with the public, including a TxDOT TSMO website (https://www.txdot.gov/insidetxdot/division/traffic/tsmo.html), TSMO brochures, presentations, videos, and FAQs. These explain how TSMO will improve safety and operational performance at a lower cost compared to more expensive capacity building projects.

TxDOT Divisions and Districts:

In addition to leadership engagement and CMM workshops, program staff interviewed 14 TxDOT staff from districts and divisions like Strategic Planning, Procurement, and Compliance to ensure perspectives of non-traditional TSMO partners were represented. Interview questions and responses were aligned with the six CMM dimensions and provided insight on challenges and solutions to meet their specific needs. For example, the Procurement Director emphasized the importance of involving them early in the procurement process to contribute their expertise in writing specifications.

Other Agencies:

TxDOT hosted CMM workshops with municipalities, law enforcement, emergency management, MPOs, toll roads, transit, universities, and other transportation agencies to identify TSMO partnering opportunities. During these collaborative workshops, participants recommended several TSMO strategies that were later included in TSMO plans or implemented.

OUTCOME, BENEFITS AND LEARNINGS

Outcomes

At the Statewide level, the TSMO Strategic Plan resulted in 38 recommendations. Technical reports, posted on the TxDOT TSMO website, were prepared by Central Office to provide Districts with details on next steps to implement these strategies. A representative sample of recommendations, listed by the six CMM dimensions, includes:

Business Processes:

- Formalize TSMO processes in succession planning to retain institutional knowledge and partnerships.

- Develop a framework to identify "what's next" in terms of innovations to support TSMO.

Systems and Technology:

- Develop a roadmap to design, build, and maintain an integrated data platform.

- Prepare unit cost estimates for TSMO project planning and budgeting.

Performance Measures:

- Incorporate operations performance measures into district decision-making processes.

- Improve safety by applying historic, real-time, and predictive performance measures.

Culture:

- Develop district managers to consider TSMO in project development and implementation.

- Provide higher level of integration of TSMO strategies with the Information Technology Division (ITD).

Organization and Workforce:

- Develop an action plan to address staff vacancies in critical traffic management program capabilities.

- Rotate TxDOT staff through different positions in the TMCs.

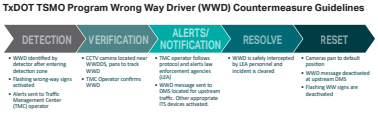
Collaboration:

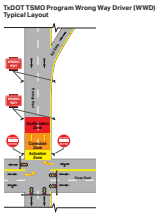
- Enhance collaboration among Traffic Safety, ITD, and Strategic Planning Division to support TSMO.

- Develop Rural Incident Management Plans for strategic corridors.

At the District level, TSMO Program Plans have been developed for 23 of the 25 TxDOT districts since 2019 resulting in 700+ strategies documented in the technical memo,"Compendium of TSMO Strategies."

Benefits





Benefits derived from the TSMO planning activities included implementation of early win projects. For example, the El Paso District developed and implemented "Wrong Way Driver Countermeasure Guidelines" resulting in standards, specifications, and design packages. These designs include a fully integrated and automated system with TMCs and 911 call centers. Other examples of initiatives and benefits include:

- Incident Management - Statewide TIM Teams' district support efforts were accelerated to reduce incident clearance times, thereby reducing lane-blockage delays and secondary-crashes.

- Consistency - The TSMO Strategic Plan and Cooperative Automated Transportation Plan initiatives were aligned to ensure these parallel efforts support each other in a cost-efficient manner.

- Operational Agreements – To address the needs identified during outreach, O&M agreements were setup for larger metro districts with more resources to provide technical support to smaller rural districts with limited resources.

- Safety Service Patrols – A HERO Safety Service Patrol performance dashboard was developed and institutionalized statewide to improve reliability of services.

Learnings

Throughout the development of TxDOT's TSMO plans, many lessons were learned and applied including (1) need for documentation of all TSMO activities to provide a smoothtransition during staff turnover; (2) implementing early wins to maintain District commitment to TSMO; (3) listening to district needs, opportunities, and constraints; and (4)conducting monthly coordination calls to ensure consistency in developing District TSMO Program Plans in alignment with the Statewide TSMO Strategic Plan. In addition, theTxDOT ITS Design Manual was revised to reflect many of the learnings from TSMO plans, checklists, and technical reports. These learnings have been implemented in advancingTxDOT's TSMO transformation from planning to implementation to operations.