

ODOT Transportation Systems Management & Operations Plan Plan Summary

Prepared for:



Prepared by:



Gannett Fleming



Burton Planning Services

May 2017

Updated December 2017

Table of Contents

Introduction	1
How the ODOT TSMO Plan was Developed	1
Technical Documents	3
Goals and Objectives Brief	3
Setting the Stage Brief	3
Resource Alignment Brief	3
Policy Action Brief	4
Performance Measures Brief	4
Early Action Implementation Plan	4
Supporting Documents	5
Communications Plan	5
ODOT Interviews Summary	5
SWOT Workshop Report	5
First District Workshop Report	6
Second District Workshop Report	6
Third District Workshop Report	6
Glossary	7
Findings	7
Recommendations	7
Resources	9
Conclusion	10
Appendix A	15

List of Tables

1.	Key Early Policy Actions, Sequential Order	8
2.	TSMO Program Measures	14

List of Figures

1.	TSMO Plan Timeline	1
2.	TSMO Plan Flow Chart	2
3.	Department Level Recommendations	11
4.	District Level Recommendations	12
5.	Division Level Recommendations	13



Introduction

Historically, state departments of transportation (DOT), including Ohio DOT (ODOT), have focused efforts and resources primarily on construction and maintenance activities. Limited focus and resources have been placed on daily operational needs. The Federal Highway Administration (FHWA) has highlighted, through their Office of Operations, the Fixing America's Surface Transportation (FAST) Act, and Moving Ahead for Progress in the 21st Century (MAP-21) legislation, the need for state DOTs to strategize, implement, and evaluate the integration of systems management and operations into the agency. This requires an ongoing, iterative process that evaluates strengths, weaknesses, opportunities, and threats (SWOT) within the context of other agency plans and initiatives while taking into consideration relationships and interactions with stakeholders. As technology and demands on infrastructure change and funding and resources become more strained, ODOT must be positioned to meet these challenges and increase efficiency in the existing system through operational improvements.

To this end, ODOT developed a Transportation Systems Management and Operations (TSMO) Plan. ODOT's TSMO Plan will serve as a road map to guide the Department as it continues to integrate operations, asset management, and preservation into the organization. The TSMO Plan is the basis for statewide policy and process changes aimed at increasing the focus and execution of traffic operations to better meet future system needs.

How the ODOT TSMO Plan was Developed

ODOT's TSMO Plan was a collaborative effort between ODOT, FHWA and consultant staff. The timeline for development of the ODOT TSMO Plan is shown in **Figure 1**.

This effort included:

- ODOT benchmarking tour data
- ODOT staff interviews and surveys
- Technical Advisory and Steering Committee input
- District and Technical Advisory Committee Workshops
- National research and best practices
- Traffic Operations Assessment Systems Tool (TOAST)
- Planning Tools development
- Communications plan

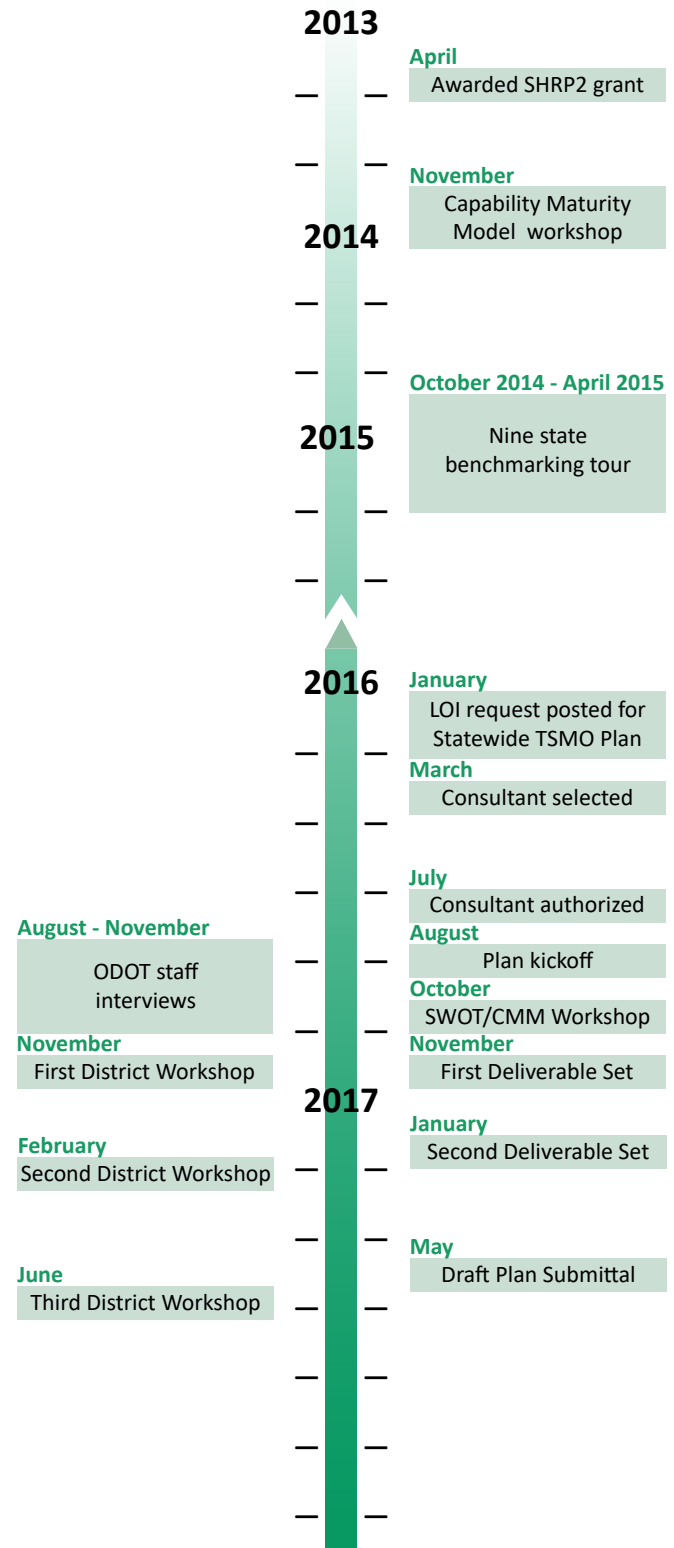


Figure 1: TSMO Plan Timeline

A number of foundational technical documents and supporting reports were also developed, including:

1. **Goals and Objectives** – setting the direction for the program.
2. **Setting the Stage** – what ODOT is doing, national best practices, and resource catalog.
3. **Resource Alignment** – recommendations for aligning ODOT resources to support TSMO.
4. **Policy Action** – recommended policy actions to establish, develop, and maintain a TSMO Program.
5. **Performance Measures** – measures and targets for setting direction, assessing the effectiveness of the TSMO Program, and identifying focus areas.
6. **Early Action Implementation Plan** – recommended immediate actions to move the TSMO Program forward.
7. **Communications Plan** – create awareness of TSMO benefits for ODOT personnel and stakeholders.
8. **Workshop and Interview Reports** – summaries and analysis of discussions with ODOT staff.

Together, these documents comprise ODOT's TSMO Plan. **Figure 2** shows how each document relates to the Plan as a whole.

The result of these efforts are summarized briefly in this Plan Summary, with a focus on recommendations to move the ODOT TSMO Program forward (see page 7).

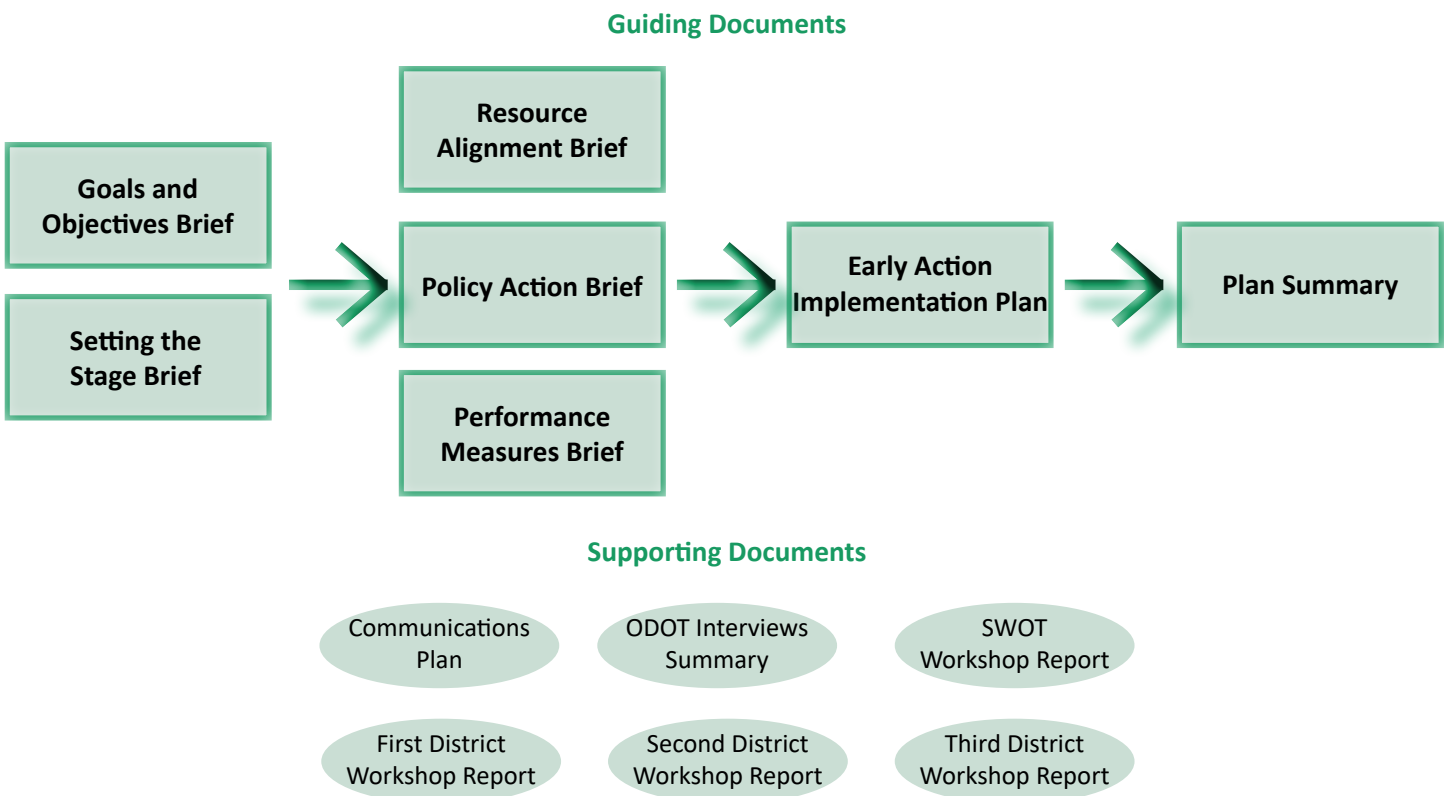


Figure 2: TSMO Plan Flow Chart



Technical Documents

1. Goals and Objectives Brief

Highlights

- The TSMO Plan supports the second point of ODOT's mission: To provide easy movement of people and goods from place to place: Make our system work better.
- ODOT's TSMO Vision: TSMO strategies and principles guide the efficient management of a safe and reliable transportation system that supports Ohio's economic vitality.
- The TSMO Plan's seven Strategic Goals:

1. Safety	5. Coordination
2. Reliability	6. Integration
3. Efficiency	7. Security
4. Access	

This Goals and Objectives Brief describes the early stages of developing ODOT's TSMO Plan. It explains the process of forming and facilitating committees, meetings, staff interviews and workshops. As a result of extensive research and collaboration with ODOT staff and leadership, the project team created Goals and Objectives and a preliminary Policy Framework for ODOT's TSMO Plan. Collectively, the Goals and Objectives serve as a basis for defining strategies that will ultimately guide ODOT to the efficient management of a safe and reliable transportation system that supports the state's economic vitality.

2. Setting the Stage Brief

Highlights

- Summarizes ODOT's TSMO efforts to date; 26 TSMO-related functions are described.
- Best practices from three nationally recognized TSMO programs are recommended for ODOT to model.
- A resource catalog includes links to and descriptions of 60 sources related to TSMO, including a number of foundational ODOT plans and documents.

During the TSMO Plan's development, the project team conducted research into current ODOT practices related to TSMO and national best practices that ODOT may want to consider. This technical brief is divided into four areas:

- ODOT TSMO efforts to date: Prior to current efforts to develop the Department's TSMO Plan, ODOT has supported many TSMO functions on a champion-led, ad hoc basis. Some functions are well developed and considered strengths; other TSMO activities are less developed or newly undertaken functions.
- Three nationally recognized innovative TSMO plans:
 - Colorado DOT
 - Iowa DOT
 - Maryland DOT
- National best practices: Sources include National Cooperative Highway Research Program (NCHRP) guidance and other DOT and regional programs considered to be best practices. These were chosen because they have a direct relation to an ODOT objective or contain elements that ODOT is interested in exploring.
- Resource Catalog: The Resource Catalog serves as a clearinghouse for sources related to TSMO, including a number of foundational ODOT plans and documents. The Resource Catalog currently contains 60 documents. It is meant to be added to as new documents and research are issued. Sources include ODOT, FHWA, American Association of State Highway Transportation Officials, Transportation Research Board, and other DOTs.

3. Resource Alignment Brief

Highlights

- A TSMO Council will be formed to prioritize and implement the plan.
- The Division of Operations will become the Division of TSMO. The Division will house the Offices of Traffic Management, Traffic — ITS Operations, Maintenance Operations and Aviation.
- District TSMO Coordinators will facilitate implementation in the Districts.



This brief explains the proposed organization and resource alignment needed to support the functions of TSMO within ODOT. It was developed with input from ODOT leadership and seeks to enhance and facilitate implementation of the TSMO Plan.

Detailed restructuring and staffing recommendations are included, accompanied by organizational charts that illustrate the proposed changes.

4. Policy Action Brief

Highlights

- 39 policy actions covering all six Capability Maturity Model dimensions provide the technical detail for implementing all aspects of ODOT's TSMO Plan.
- A one-page profile sheet for each policy action describes critical steps, benefits, impacts, outcomes, responsible offices, priority rankings, and durations.

The proposed policy actions in this brief were developed from various inputs including staff interview analysis, workshops, meetings, review of business plans, staffing plans, organizational charts and ODOT's Strategic Highway Research Program 2 (SHRP2) Scan Tour recommendations. The recommendations offer a comprehensive policy framework to guide the TSMO Program's development.

5. Performance Measures Brief

Highlights

- Lists performance measures for all of the TSMO Plan's program objectives.
- Describes the ten key program measures that will be used to guide priorities, track implementation, and define success for the program.

Performance measurement is a key component in the transition to a performance and outcome-based program. Programs that are measured are managed more efficiently than those that are not measured. Each program objective identified in the Goals and Objectives Brief includes specific performance measures and an associated target, describing what needs to occur to accomplish the goal. The

performance measures developed for ODOT's TSMO Plan were grouped into Program, Secondary, and Monitoring categories.

The Performance Measures Brief, and **Table 2** in this document, show the ten program level measures that represent the core program objectives, performance measures, and targets of the TSMO Program. These measures should be given high priority as the program evolves. The proposed program level performance measures will be a tool for the TSMO Council to periodically evaluate the progress and effectiveness of the TSMO Program.

6. Early Action Implementation Plan

Highlights

- Identifies 14 Policy Action steps critical to moving ODOT's TSMO Program forward immediately.
- Lists 10 program measures to track progress on core program objectives.
- Describes key program tools, such as the Traffic Operations Analysis System Tool (TOAST).

ODOT's Early Action Implementation Plan for TSMO draws on content from several of the TSMO Plan's guiding documents to provide structure and direction during the initial roll-out of the Plan. It outlines early activities, actions, and tools that are critical in creating ODOT's TSMO Program. Further details are in these guiding documents of ODOT's TSMO Plan:

- Policy Action Brief
- Resource Alignment Brief
- Performance Measures Brief

The Early Action Implementation Plan is intended to serve as a guide to ODOT on the most critical portions of the TSMO Program that need to move forward immediately.

These six technical documents form the core of ODOT's TSMO Plan. They provide foundational principles, policy frameworks, technical guidance, strategies, and timelines.

Supporting Documents

In addition to the above guiding technical documents, a number of supporting documents were also created during the TSMO Plan's development, described below.

1. Communications Plan

Highlights

- Internally focused communications plan to promote TSMO awareness at ODOT.

The goals and objectives of the TSMO Communications Plan are to create awareness of TSMO benefits for ODOT personnel and stakeholders, develop persuasive messages and materials that lead to productive internal engagement, and generate momentum for and understanding of TSMO with ODOT personnel and stakeholders. A separate initiative is engaging external partners to solicit feedback on the draft Plan.

2. ODOT Interviews Summary

Highlights

- The project team interviewed over 30 different divisions, business units, offices and programs.
- Challenges that staff identified include: home rule/cross-jurisdictional issues, data management, organizational structure and funding.

To better understand ODOT's organizational structure, its many programs, roles, and responsibilities, and its operational, technological, and administrative functions, the project team interviewed a number of ODOT divisions, business units, and programs during the Fall of 2016. This report, divided into two sections, summarizes the information and opinions that ODOT staff shared with the project team.

3. SWOT Workshop Report

Highlights

- The Capability Maturity Model (CMM) uses six dimensions to measure an agency's level of capability in TSMO: Business Processes, Systems and Technology, Performance Measures, Culture Organization and Staffing, and Collaboration
- Of the 20 operations-related programs evaluated by the CMM, ODOT scored well (greater than 2 out of 4) in Traffic Safety Engineering, Traffic Incident Management/Emergency Management, Data Analysis/Performance Measures/Critical Success Factors, Freeway Service Patrols, Work Zone Management, Signing and Pavement Markings and the Traffic Management Center.
- The report provides a snapshot of ODOT's TSMO capabilities and will be updated regularly as progress is made.

In October 2016, the consultant team facilitated a workshop with Central Office and District staff to explore the Department's strengths and weaknesses in Traffic Operations, and rate ODOT's functional and organizational capabilities. The consultants presented an overview of ODOT's TSMO planning efforts and the use of the Capability Maturity Model (CMM) to measure departments' of transportation performance in operations. Staff then conducted a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis of 20 operations-related programs at ODOT that range from highway lighting to Connected and Autonomous Vehicles.



4. First District Workshop Report

Highlights

- Workshop activities included a TSMO organizational chart exercise and SWOT analysis of ODOT's TSMO functions.
- Post-workshop survey results show that 94% of respondents rated the workshop as "useful" or "very useful." 82% of respondents rated the workshop as "effective" or "very effective" in increasing their TSMO understanding.

An education and awareness workshop, held in November 2016, initiated the engagement of ODOT Districts in the TSMO Plan's development. Fifty-five ODOT personnel representing all 12 Districts attended along with some Central Office staff.

The goals of the workshop were:

- Engage Districts in conversation about the TSMO Plan – its value to ODOT and Implementation.
- Discuss how TSMO will benefit ODOT at all levels.
- Discuss what ODOT is already doing and present ideas for future plans.
- Understand District needs and challenges related to current processes and organization.
- Share ideas on how TSMO fits within the framework of ODOT.
- Gain insight on how to communicate TSMO within ODOT.
- Increase ODOT's level of TSMO understanding.

The program consisted of ODOT and FHWA speakers as well as breakout sessions to analyze District organizational structure related to TSMO functions, and to conduct SWOT analyses on specific areas of TSMO. The results of this workshop informed the Goals and Objectives and initial Policy Framework recommendations of the TSMO Plan as well as components of the Communications Plan.

5. Second District Workshop Report

Highlights

Workshop discussions covered the following topics:

- Role of District TSMO Coordinators
- Resource Alignment
- Relationship with Local Jurisdictions
- TSMO Training Requirements and Qualifications

The second workshop was held in February 2017, with over 50 ODOT District and Central Office staff in attendance. Although brief updates were given at the beginning of the workshop, the primary focus was to involve the Districts in shaping the recommendations of the TSMO Plan. To this end, the project team led an open discussion between district employees about challenges and opportunities they may face when implementing TSMO.

The workshop concluded with small groups organized to identify District operational hot spots and potential TSMO strategies to relieve congestion.

6. Third District Workshop Report

Highlights

Workshop discussions covered the following topics:

- Role of District TSMO Coordinators
- Resource Alignment
- Relationship with Local Jurisdictions
- TSMO Training Requirements and Qualifications

The third workshop was held in June 2017, with over 60 ODOT District and Central Office staff. There were several goals of the workshop:

- Review scope and substance of the Draft TSMO Plan, with emphasis on roles and benefits across Districts and Divisions.
- Invite and address District representative feedback.
- Initiate regional conversations about challenges and opportunities related to implementation.



In the morning, the project team presented an overview of ODOT's Draft TSMO Plan, discussing and answering questions related to the Plan Summary. The Q&A session was followed by remarks from Assistant Director Barna, a brief presentation about the planning tools developed for TSMO and current examples of TSMO applications in the Districts. An in-depth policy brief discussion, performance measures presentation, and FHWA presentation concluded the morning activities.

In the afternoon, participants continued to discuss the Plan in small groups, led by project team members and ODOT Central Office staff.

Glossary

The glossary, attached to the Policy Action Brief, lists acronyms that are used in one or more of the TSMO Plan's documents. Some phrases are specific to TSMO while others are general transportation planning terms.

Findings

Ohio, like many other states, faces significant challenges associated with the movement of people, goods, and services. The issues of mobility and safety are not unique to Ohio. For many years these issues were addressed through traditional construction and maintenance functions. With projected increases in congestion, advancements in technology, and limitations in funding, there is a recognition that a new approach is needed for Ohio's transportation system. The DOT must shift to an approach that emphasizes the operation of the system in real-time. This allows the operation of the roadway to be responsive to constantly changing conditions. Because TSMO deals directly with the root causes of congestion and unreliable travel (incidents, weather, work zones, special events, bottlenecks, and other supply and demand variations), it offers the potential to improve travel time reliability and help system users travel to their destinations safely and efficiently. Embracing the concepts and ideals of TSMO provides a real opportunity to provide guidance and direction for making strategic decisions to meet mobility challenges in Ohio. This approach is being utilized in many other states including 22 other DOTs that were also provided SHRP2 TSMO grants. ODOT is in line with the majority of other states in their progression

to an Operations focused transportation agency. The recommendations from this report should continue the progress made to date and leverage future investments to be strategic in their approach to addressing mobility issues.

Key findings/needs include:

- Additional resources, primarily in the form of staffing, dedicated to TSMO functions (i.e. need for the right people in the right places).
- Dedicated funding of a TSMO Program to implement plan recommendations.
- Expand TSMO functions in the Districts.
- Solve the challenge of de-centralizing TSMO.
- Data-driven performance measures.
- Continued collaboration with external partners.

Recommendations

The following recommendations are immediate actions to advance ODOT's TSMO Program. These were primarily taken from the TSMO Early Action Implementation Plan.

TSMO Program Development

Several mechanisms will guide the continued growth and development of the TSMO Program at ODOT:

- **TSMO Council**—The TSMO Council will be responsible for setting the priority for and tracking the implementation of the program. The Council shall meet a minimum of four times per year, but more frequent meetings will be established as needed. The Early Action Implementation Plan could be used as a basis for the TSMO Council to start its oversight activities.
- **Regular TSMO Plan Updates** – The TSMO Plan should receive a comprehensive update at least every four years to maintain relevancy with the latest technologies and strategies. TSMO budgeting activities should occur every year over a four-year horizon.
- **Capability Maturity Model (CMM)** – An annual self-assessment of TSMO functions should be conducted to measure ODOT's progress. This exercise can be performed in conjunction with annual work plans or business planning.

Policy Actions

The Policy Action Brief contains recommendations related to activities ODOT should consider to move the TSMO Program forward. Recommendations are organized in relation to the CMM model that ODOT uses to measure its TSMO-related development. As ODOT completes the recommended actions it will elevate the organization's score on the CMM scale.

Table 1 highlights recommended Policy Actions critical to establishing the TSMO Program at ODOT. These 14 actions are a subset of the 39 total actions that the TSMO Plan recommends. The table lists the critical Policy Actions, their reference to the Policy Action Brief and their current development status. For more detail on each recommended action, its timeline, needed resources, critical steps, and benefits, please refer to the identified one-page summaries in **Appendix A**.

Table 1: Key Early Policy Actions, Sequential Order

Recommended Action	Current Status	Policy Action Brief Reference #
Create and maintain a TSMO Council.	Complete	CO2
Develop and implement an internal communications plan.	In Progress	CU3
Develop Traffic Operations Assessment System Tool (TOAST).	In Progress	BP1
Include TSMO in PIP and PDP.	In Progress	BP3
Include TSMO in Long Range Transportation Planning (MPOs, RTPOs, and ODOT).	In Progress	BP7
Establish TSMO organizational guidelines.	In Progress	OS2
Establish TSMO Coordinator for each District.	In Progress	OS3
Pursue interim TMC upgrades and improvements.	Initial Discussions	ST2
Develop four-year TSMO Program Plan with funding sources and identified budgets.	No Action	BP6
Develop TSMO policies, procedures, and guidance documents.	To Be Scheduled	BP8
Establish TSMO job descriptions, classifications, career paths, etc.	Initial Discussions	OS1
Develop sustainable TSMO training program for ODOT.	No Action	OS5
Integrate TSMO in the guiding documents of the Department (ODOT Business Plan, Strategic Plan).	In Progress	CU1
Develop and maintain a TSMO business case with Ohio data.	No Action	CU2

Resources

The Resource Alignment Brief describes the proposed organizational alignment of resources to support the TSMO Program. Included in this brief are existing and projected staffing needs to move the TSMO Program forward in the immediate future. Also included are future staffing projections for what a mature and established TSMO Program may require. Many of the below recommendations are also part of the Policy Action Brief recommendations, which provide more detail on schedules and critical steps for implementation.

Immediate actions related to Resource Alignment required to establish ODOT's TSMO Program include:

- Re-organize the Division of Operations into the Division of TSMO (**Figure 3, page 11**).
- Establish District TSMO Coordinator (**Figure 4, page 12**).
- Align internal functions/staff to support TSMO across ODOT (**Figure 5, page 13**).
- Fill needed positions to maintain support of existing TSMO functions and add TMC staff to cover hard shoulder running, variable speed limits, and increased signal systems operations.
- Form a TSMO Council with a charter similar to the Asset Management Leadership Team (AMLT).

Traffic Operations Analysis Systems Tool (TOAST)

As part of developing the plan, an immediate need has been identified to systematically assess operationally sensitive highway segments to assist in prioritizing, planning, and programming future TSMO strategies. These strategies include detection, surveillance, freeway service patrols, hard shoulder running, ramp metering, variable speeds limits, signal systems, and traveler information.

Most DOTs excel at assessing the condition of pavements and bridges. Very few agencies have systematically looked at traffic operations from a statewide perspective beyond relatively simple volume to capacity ratio calculations. With the emergence of new data sources (e.g., probe data) related to operations, measures can now be developed that were only usable on a limited basis five years ago. While

discussions regarding the development of the TOAST have just begun, this effort must be prioritized, as it will generate foundational information for the TSMO Program. A sampling of the criteria that will be integrated into this statewide geospatial tool include:

- Bottleneck Occurrences (for all vehicles)
- Freight Bottleneck Occurrences
- Traffic Incident Frequency
- Traffic Incident Clearance Time
- Crash Rate
- Travel Time Reliability Index (TTRI)
- Snow & Ice Control Performance Evaluator (time to recover speeds after a winter weather event)
- Average Annual Daily Traffic (AADT)

The TOAST will allow users to weight each criteria to assess relative importance to ODOT. Primary TOAST users will be ODOT Central Office staff assigned to determine where TSMO resources should be planned and programmed in coordination with other programs such as the safety, bridge, and paving programs. District staff will play a supporting role. By individual criteria or weighted average, users will be able to generate:

- A ranking table, listing corridors from most operationally sensitive to most efficient from a traffic operations perspective.
- A color coded map that highlights operationally sensitive segments.

The proposed coverage for the operations assessment tool is Ohio's freeway system, including all Interstates as well as select major "Interstate look-alike" highways such as State Route 315 in Columbus, State Route 8 in Akron, and U.S. Route 35 in Dayton. The proposal includes approximately 7,000 center-lane miles (equal to the TTRI). In the future, as data allows, it may be expanded to include the entire Strategic Transportation System (STS), and possibly the whole ODOT system.



This tool will provide ODOT planners with valuable information for developing work plans, correlating operations and safety needs, and prioritizing expenditures. Without a tool like TOAST, operations-oriented investments will likely continue to be made on an ad hoc basis, without consideration of how investments may be more strategically applied.

Other Tools

ODOT's TSMO Plan is a living document and will require frequent maintenance and updates as the program and technologies that support it evolve. To aid in these updates, a spreadsheet tool has been developed that allows for the one-page Policy Action Brief recommendations to be updated, modified, or new recommendations added. This flexibility will allow the core portion of the TSMO Plan to change with technologies, priorities, or needs.

Performance Measures

Currently ODOT tracks 21 Critical Success Factors (CSFs). Two of the CSFs are directly related to TSMO and fall into the Operations category. These CSFs are Travel Time Reliability Index (TTRI) and Snow and Ice Control.

Just as ODOT measures the entire organization through the CSFs, the TSMO Program needs to measure itself through its own TSMO-specific performance measures. The Performance Measures Brief outlines the proposed TSMO Program objectives, measures, and targets. The brief includes ten program objectives with corresponding performance measures and targets for consideration.

The ten program level measures in **Table 2** (page 14) represent the core program objectives, performance measures, and targets and should be given high priority as the TSMO Program evolves. The proposed program level performance measures will be a tool for the TSMO Council to periodically evaluate the progress and effectiveness of the TSMO Program.

To illustrate ODOT's progress, an online dashboard should be developed that can be viewed internally, by ODOT's external partners, and eventually by the public. Many other

DOTs have established publicly facing dashboards that can be used as a model for ODOT's future dashboard. For more information, refer to the PM3 one-page profile sheet in the Policy Action Brief.

Conclusion

In any planning process, the publication of the final report or recommendations does not signal the end. Rather it is just the beginning of implementing real change. This is especially true for TSMO compared to other traditional planning processes. With TSMO, ODOT is attempting to change the way it conducts business to make the organization more prepared to deal with the transportation challenges of today and tomorrow. This document cannot just sit on a shelf. It needs to be used as the playbook for making positive changes moving forward. With new technology applications coming on line at an accelerating rate, it is an unprecedented time for transportation in Ohio. With the right strategic actions and focus, Ohio can become a leader in TSMO implementation and leverage these new approaches and technologies to improve the lives of the users of Ohio's transportation system through taking care of what it has and making the system work better, which improves safety and enhances capacity.

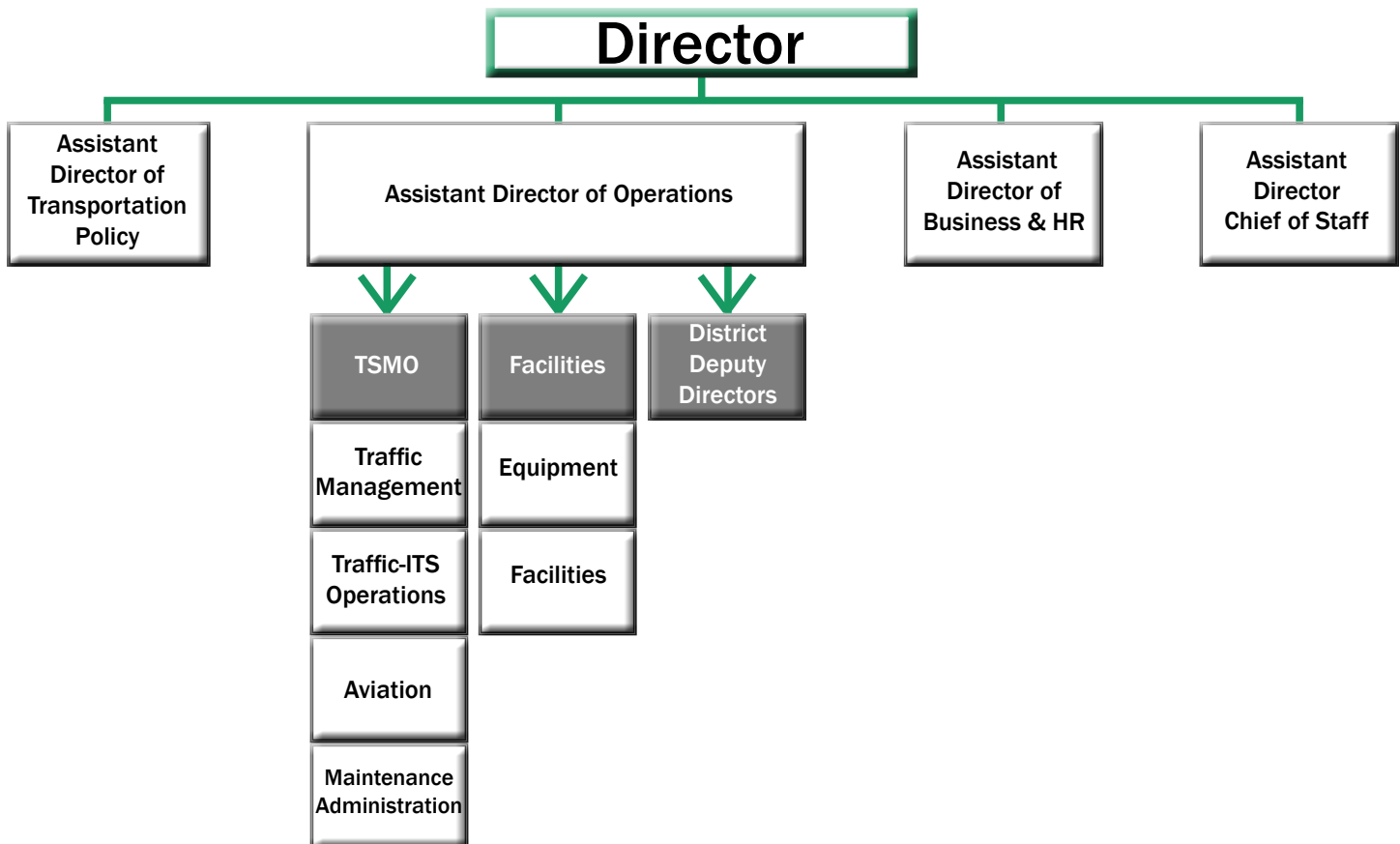


Figure 3: Department Level Recommendations

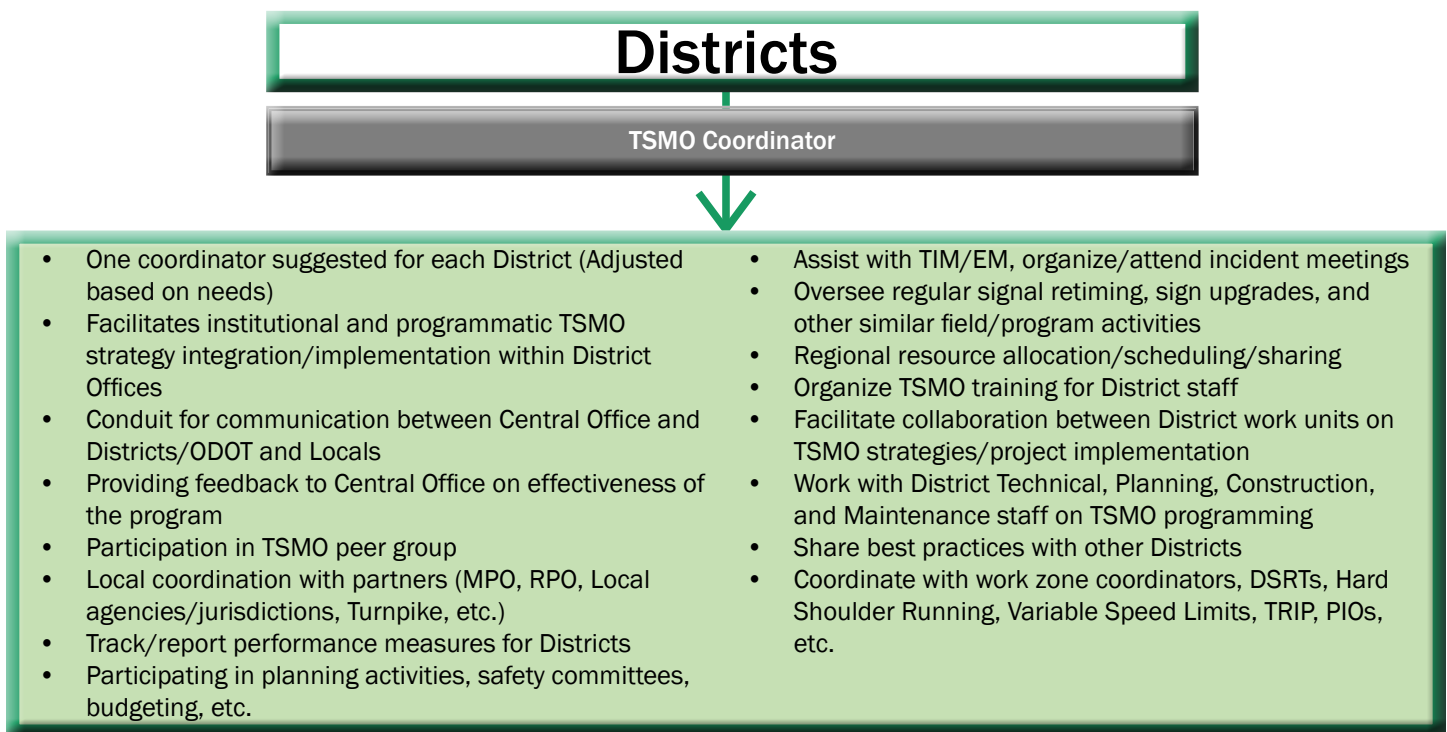


Figure 4: District Level Recommendations

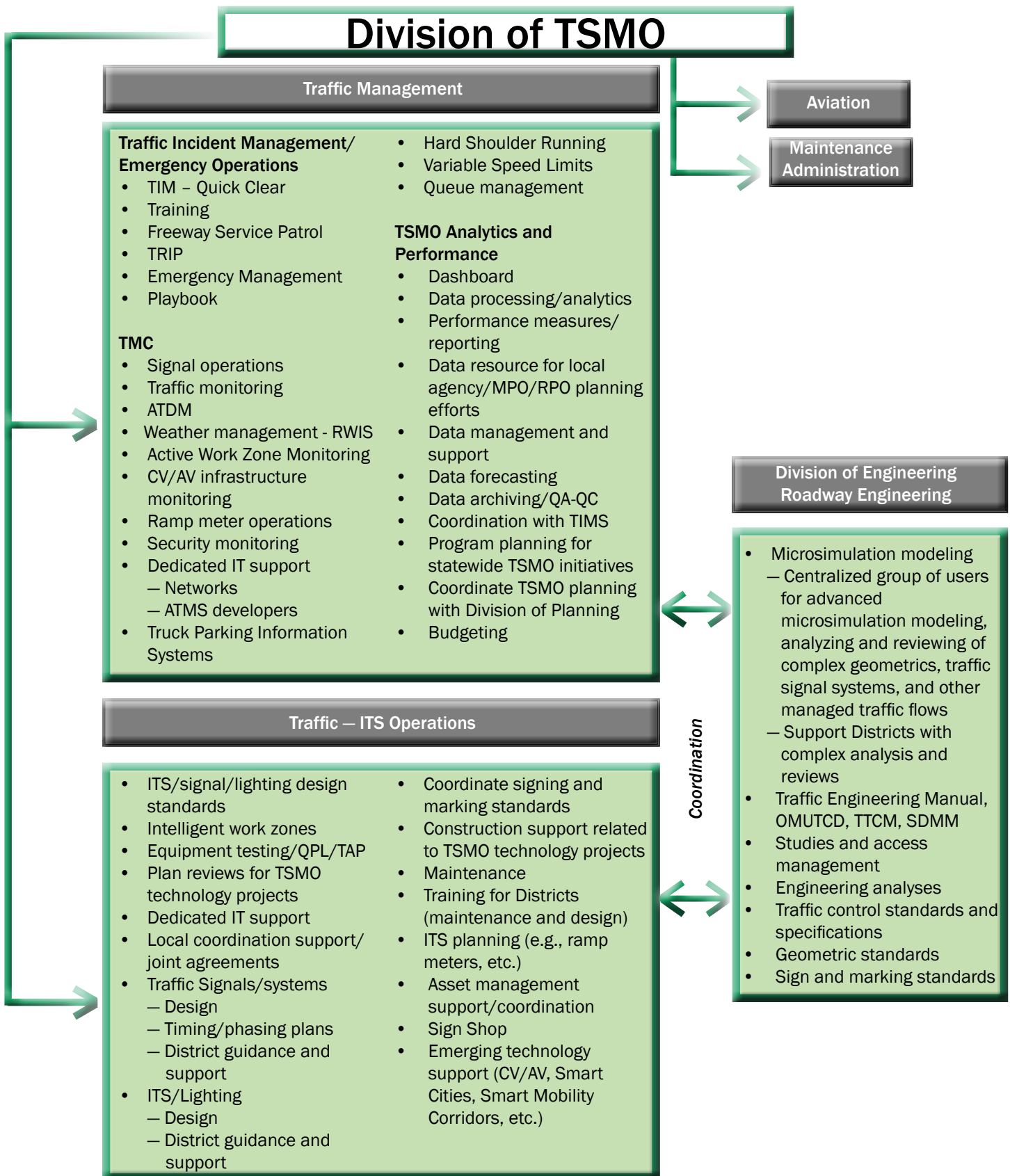


Figure 5: Division Level Recommendations

Table 2: TSMO Program Measures

Program Objectives	Performance Measures	Targets
Reduce secondary crashes caused by traffic incidents.	Percentage of secondary crashes to primary crashes on monitored freeways.	< 15% of all TMC-verified crashes.
Reduce work zone related crashes.	Frequency of work zone crashes.	Reduce by 1% over a 5 year moving average.
Reduce roadside "struck by" incidents.	Frequency.	Zero.
Maximize free flow travel time on Ohio's freeway system.	Percent of time motorists experience free flow travel time (TTTI).	> 88%
Increase resilience of the transportation system to winter weather events.	Percent of routes that recover speeds within 10 MPH of the expected speeds within 2 hours of a snow event ending.	> 96%
Reduce Incident clearance.	Duration.	To be determined.
Reduce Roadway clearance.	Duration.	To be determined.
Optimize signalized corridors.	Percentage of corridors retimed per year.	25% of Tier 1 and Tier 2 Corridors.
Reduce work zone traffic delays.	Number of hours the operating speed is less than 35 MPH per monitored work zone.	Increase no more than 25% over preconstruction.
Provide consistent incident response and management across the state.	Percentage of TIM trained emergency responders in state (DOT/Public Works, Fire, Police, Towing, EMS).	Increase by 5% per year over 5 years.



Appendix A: Critical Policy Actions



CO2. Create and maintain a TSMO Council.

Priority: Tier 1

- Status: To Be Scheduled
- Duration: Ongoing

Lead Offices

- Central Office
- District Deputy Directors

Supporting Offices

- Traffic Operations
- Program Management
- District TSMO Coordinators

Resources Needed

- Executive leadership time and staff support for council meetings.

Dependencies

- BP8

Associated Goals

- 5. Coordination

Associated Objectives

- Define roles and responsibilities between ODOT Planning and Operations.
- Define roles and responsibilities between Districts and Central Office that will improve TSMO statewide.

Description:

- The TSMO Council would be a cross-divisional group to help guide the continued implementation of TSMO throughout the Department.
- The Council will include both Central Office and District staff.
- The Council will meet on a regular basis, review and discuss TSMO related advancements and project applications.
- The purpose of the group is to provide leadership and authority to move the TSMO Plan forward.
- Responsibilities include:
 - Routinely inform and engage ODOT leadership on TSMO implementation activities and its effectiveness.
 - Encourage routine Central Office and District collaboration in planning for TSMO.
 - Resolve disagreements or conflicting operational priorities.
 - Oversee and review bi-annual TSMO self-assessment at Central Office level and update the Capability Maturity Model plan accordingly.
 - Provide recommendations on implementation priorities and funding.

Critical Steps:

1. Develop a charter similar to Technology Council.
2. Identify leadership and participants. Assign a staff person to support and assist in administering the leadership group.
3. Assemble group for kickoff and charter signature. Schedule and hold monthly meetings initially; move to less frequent meetings as need.
4. Develop summary materials and tracking for two years of TSMO activities to help guide the group.
5. Assign subcommittees or leaders to begin leading development/implementation of the ODOT TSMO Plan policy recommendations.

Benefits, Impacts, Outcomes:

- The TSMO Council ensures routine check-in and accountability on delivering ODOT TSMO Plan recommendations.
- Helps accelerate TSMO culture throughout ODOT.
- Provides forum for interdisciplinary and emerging areas (e.g., work zone management, smart cities, Connected and Autonomous Vehicles).
- Provides forum for discussing successes and challenges between Central Office, District and local efforts.
- Provides collaborative leadership from all of ODOT so that proposed changes consider impacts to all aspects of the Department.
- Monitors and provides reports to executive management regarding the program.
- Evaluates outcomes of TSMO investments in strategies and projects.
- Provides forum for continually improving the TSMO planning, development, and implementation process.



CU3. Develop and implement an internal communications plan.

Priority: Tier 2

- Status: To Be Scheduled
- Duration: Ongoing

Lead Offices

- Central Office

Supporting Offices

- Communications
- Traffic Operations
- District Public Information Officers

Resources Needed

- Staff time to develop and execute plan.

Dependencies

- CO2

Associated Goals

- 5. Coordination

Associated Objectives

- Engage all ODOT disciplines and external partners to proactively manage and operate the transportation system.

Description:

- Internal buy-in is critical to the success of ODOT's TSMO Program.
- In the Fall of 2016, 75 percent of respondents to an internal survey reported some degree of unawareness on the concept of TSMO.
- The Communications Plan will educate ODOT's staff and leadership team about the positive changes that TSMO is bringing to the Department, such as improved communication, streamlined decision-making processes, and more efficient resource allocation.
- The TSMO Council will play an important role in the education process.

Critical Steps:

1. Use TSMO External Communications Plan as a starting point for creating the internal communications plan.
2. Identify primary audiences.
3. Identify and recruit TSMO champions to conduct outreach at Central Office and in Districts. Newly designated District TSMO Coordinators could assume this responsibility.
4. Include TSMO updates in regular, internal news platforms, and special events:
 - ODOT Messenger.
 - The Loop, a bi-weekly video newscast posted internally and externally.
 - TranScript, a monthly employee newsletter.
 - Quarterly video from the Director.
 - Annual Team Up ODOT event showcasing agency innovations.
 - Annual Ohio Transportation and Engineering Conference (OTEC).
 - Training (OS5).
5. Include strategies to maintain TSMO knowledge, introduce the latest TSMO strategies and technologies, and communicate TSMO Council updates.
6. Identify plan for coordinating with external partners.
7. The outreach plan should be updated in conjunction with the regular TSMO Plan update cycle to include the most recent techniques and communication platforms.

Benefits, Impacts, Outcomes:

- TSMO will be more successful when there is a widespread understanding of its benefits across the Department.
- Regular news updates will reinforce TSMO's central role in ODOT's day-to-day activities.
- Outreach will encourage a departmental shift toward operations.





BP1. Develop a Traffic Operations Assessment Systems Tool (TOAST).

Priority: Tier 1

- Status: In Progress
- Duration:
 - Development: 6 months
 - Operation: Ongoing

Lead Offices

- Central Office

Supporting Offices

- Technical Services
- Information Technology
- Traffic Operations
- Capital Programs Management

Resources Needed

- Staff time

Dependencies

- None

Associated Goals

- 1. Safety
- 2. Reliability
- 3. Efficiency
- 6. Integration

Associated Objectives

- Incorporate TSMO strategies throughout ODOT's transportation planning, design, construction, maintenance, and operations activities.

Description:

- ODOT needs to systematically assess operationally sensitive segments of highway.
- Implementing TSMO strategies such as detection, surveillance, freeway service patrols, and traveler information for these highway segments will impact system performance.
- Unlike pavements and bridges or safety/incidents, ODOT does not systematically assess traffic operations performance from a statewide perspective beyond a relatively straight forward look at volume to capacity ratios and historical traffic volumes.
- New data sources (e.g., probe data subscriptions) developed in the last five years provide the capability to measure and assess traffic operations performance.
- This tool will provide a foundation that can be enhanced over time to include more data and assist other program areas with planning and prioritization of projects.

Critical Steps:

1. Work with the Division of Information Technology and Transportation Information Management Systems (TIMS) group, as appropriate, to develop Traffic Operations Assessment Systems Tool (TOAST).
2. Convene an inter-agency group to refine the framework, uses, default criteria weighting, and desired outcome of TOAST.
3. Conduct a data discovery phase to identify available data sets, their ability for interactions with TOAST, and gaps in existing data.
4. Run tool analysis for several pilot Districts; confirm accuracy of analysis with Districts.
5. Create hotspot maps to identify operationally sensitive segments.
6. Implement and expand TSMO field applications (ST5) in accordance with analysis outputs.
7. Update annually (at a minimum) in coordination with longer-term TSMO planning and programming activities.
8. Establish interfaces between TOAST and data sharing tools, such as ATMS data and HERE traffic analytics speed data.
9. Expand TOAST functionality to query and analyze archived/historical data.
10. Continue to look for ways to expand TOAST capabilities to assist other ODOT program areas with needs analysis.

Benefits, Impacts, Outcomes:

- ODOT will have a better understanding of where TSMO resources need to be applied throughout the state.
- Will identify TSMO-related hotspots for improvements that can be addressed immediately, showcasing the utility of the TSMO Program during its initial stages.
- Over time, TSMO projects will be prioritized alongside traditional highway and bridge projects.
- Opportunity for collaboration between different disciplines within ODOT (IT, operations, planning).



BP3. Include TSMO in Project Initiation Package (PIP) and Project Development Process (PDP).

Priority: Tier 1

- Status: In Progress
- Duration: 12 months

Lead Offices

- Central Office
- Districts

Supporting Offices

- Environmental Services
- Traffic Operations
- Statewide Planning and Research
- Roadway Engineering
- Capital Program Management

Resources Needed

- Staff time

Dependencies

- None

Associated Goals

- 5. Coordination

Associated Objectives

- Define roles and responsibilities between ODOT Planning and Operations.
- Define roles and responsibilities between Districts and Central Office that will improve TSMO statewide.

Description:

- To realize the full range of benefits, TSMO solutions need to be considered at the earliest stages of project development.
- A checklist to ensure that TSMO strategies are considered during the project planning and scoping stages would allow this concept to be integrated into the ODOT Project Development Process.
- TSMO items should be included in the PIP and PDP phases as appropriate instead of an afterthought or 'alternative' solution.

Critical Steps:

1. Convene an inter-agency group from the appropriate supporting offices.
2. Develop a list of recommended PDP modifications that can be made to ensure TSMO is considered throughout the PIP and PDP.
3. Assign business process modification assignments to staff.
4. Implement and formalize PIP and PDP modifications and provide training as needed.

Benefits, Impacts, Outcomes:

- Opportunities for integrating TSMO will not "fall through the cracks."
- Systematic application of TSMO early in project scoping and development will save the Department money by avoiding and/or deferring expensive capacity expansion projects.
- By formalizing ITS and operations in the PIP and PDP, TSMO culture will expand throughout the Department.
- Will likely require the need for expanded use of microsimulation modeling to demonstrate potential TSMO benefits.
- Ensures critical infrastructure is rightfully accompanied by technologies and procedures to sustain it.
- All projects will be screened for safety, traffic operations, and ITS.



BP7. Include TSMO in Long Range Transportation Planning (MPOs, RTPOs, and ODOT).

Priority: Tier 2

- Status: To Be Scheduled
- Duration: 2 years

Lead Offices

- Central Office

Supporting Offices

- Traffic Operations
- Statewide Planning and Research
- Capital Program Management

Resources Needed

- Staff time

Dependencies

- BP1

Associated Goals

- 5. Coordination
- 6. Integration

Associated Objectives

- Engage all ODOT disciplines and external partners to proactively manage and operate the transportation system.
- Integrate TSMO into existing ODOT Policies, Plans, and Procedures.

Description:

- ODOT updates its long range plan approximately every five years. Incorporating TSMO into the plan's recommendations and strategies will further embed it in ODOT's mission and culture.
- As TSMO is adopted internally at ODOT, promoting the program to external stakeholders will expand its reach across the state.
- Working with MPOs/RTPOs to include TSMO in long range planning efforts would further ingrain TSMO in Ohio's transportation culture.

Critical Steps:

1. During the next long range plan update (Access Ohio 2045), include members from the TSMO Council, Technical Advisory Committee, and Steering Committee in plan development, and on the long range plan steering committee.
2. Encourage collaboration during both ODOT and MPO/RTPO planning processes.
3. Align long range plan goals with TSMO mission, vision, and goals.

Benefits, Impacts, Outcomes:

- Including TSMO in long range planning will help ensure its longevity across administrations and funding changes.
- Ingrains TSMO in ODOT strategic planning and long term trajectory.
- Establishes TSMO's importance at MPO/RTPO level.
- Will open up new funding sources and project opportunities on local arterial systems.
- Long-term TSMO strategies can minimize the need for costly capacity-adding projects.

OS2. Establish TSMO organizational guidelines.

Priority: Tier 1

- Status: In Progress
- Duration: 6 months

Lead Offices

- Central Office
- Districts

Supporting Offices

- Traffic Operations
- Human Resources
- Executive Management

Resources Needed

- Staff time

Dependencies

- CU3
- CO2

Associated Goals

- 5. Coordination

Associated Objectives

- Define roles and responsibilities between District and Central Office that will improve TSMO statewide.
- Define roles and responsibilities between ODOT Planning and Operations.

Description:

- Currently, TSMO functions exist on an ad hoc basis, dispersed across various offices and in the Districts.
- A more consistent approach will reduce miscommunication and inefficient use of staff time/resources.
- The resource realignment recommendations in the TSMO Plan provide guidance on staffing, collaboration, and responsibilities related to TSMO.
- District TSMO Coordinators, located in the Districts, will coordinate TSMO between the Districts and Central Office, and ODOT and local partners.

Critical Steps:

1. Establish an agency-wide TSMO organizational structure.
2. Establish TSMO job descriptions and classifications (OS1).
3. Use resource realignment recommendations and work with Human Resources and TSMO Council to assign roles and responsibilities to TSMO positions at Central Office and in Districts.
4. For TSMO related recruitment efforts, reconsider areas of expertise from which candidates are drawn (e.g., computer science, electrical and computer engineering, etc.)
5. Establish a communications and training program to convey the responsibilities of the TSMO-related roles. Training will help standardize TSMO functions across ODOT (OS5).

Benefits, Impacts, Outcomes:

- A formalized grouping of TSMO roles and responsibilities will lend credibility to TSMO as a central element of the Department.
- Reorganization could establish ODOT as a leader in TSMO structuring among its peers.
- TSMO organizational structure will improve communication between Central Office and Districts.
- District TSMO Coordinators will strengthen communication with external partners and provide clear points of contact for coordination.



OS3. Establish TSMO Coordinator for each District.

Priority: Tier 1

- Status: In Progress
- Duration: 6 months

Lead Offices

- District

Supporting Offices

- Human Resources
- Deputy Directors

Resources Needed

- New classification series
- Staff time

Dependencies

- OS1
- OS2

Associated Goals

- 5. Coordination

Associated Objectives

- Define roles and responsibilities between Districts and Central Office that will improve TSMO statewide.

Description:

- District TSMO Coordinators will play a critical role during the implementation and ongoing management of TSMO at ODOT.
- The coordinator will be responsible for:
 - Facilitating institutional and programmatic TSMO strategy integration/implementation within District Offices.
 - Communication between Central Office/Districts and ODOT/Locals.
 - Providing feedback to Central Office on effectiveness of the program.
 - Participation in TSMO Peer Group.
 - Local Coordination with Partners (MPO, RPO, local agencies/jurisdictions, Turnpike, etc.).
 - Tracking/reporting performance measures for Districts.
 - Participating in planning activities, safety committees, budgeting, etc.
 - Assisting with TIM/EM; organize/attend incident meetings (CO4).
 - Overseeing regular signal retiming, sign upgrades, and other similar field activities.
 - Developing strong local relationships with staff and partners.
 - Regional resource allocation/scheduling/sharing.
 - Organizing TSMO training for District staff (OS5).
 - Facilitating collaboration between District work units (HMA, PE, and Construction) on TSMO strategies/project implementation.
 - Working with District Technical, Capital Program Management, and Maintenance staff on TSMO programming.
 - Sharing TSMO programming and implementation best practices with other Districts
 - Other coordination responsibilities include: working with work zone coordinator for compliance, DSRTs, hard shoulder running and variable speeds, and the TRIP Program, and assist PIO with media as needed.

Critical Steps:

1. Clarify and define the role and responsibilities of a District TSMO Coordinator.
2. Encourage and support the identification of District TSMO Coordinators.
3. Encourage and support the training of District TSMO Coordinators.
4. Educate ODOT staff on the Coordinators' roles and responsibilities.
5. Encourage the integration of Coordinators into District operations.
6. Establish and maintain a TSMO District Coordinators Peer Group to encourage collaboration, share best practices, and provide periodic updates to the TSMO Council.
7. Encourage routine communication between coordinators and Central Office.

Benefits, Impacts, Outcomes:

- District TSMO Coordinators will improve communication within and between Districts, and between the Districts and Central Office.
 - Provide a single, local, point of contact for external partner communication and coordination.
 - Provide a single point of contact for internal ODOT communication with Districts.
- A coordinated approach to TSMO in the Districts will increase the program's efficiency and amplify its impacts.
- In concept, align Districts with statewide TSMO initiatives.

ST2. Pursue interim Traffic Management Center upgrades and improvements.

Priority: Tier 1

- Status: To Be Scheduled
- Duration: 12 months

Lead Offices

- Central Office

Supporting Offices

- Traffic Operations
- Signal Operations
- ITS Operations
- Sign Operations
- Freeway Operations
- District HMAs
- Information Technology
- Partner Agencies

Resources Needed

- Staff time
- Consultant Support
- Facilities and Software Development — \$500,000

Dependencies

- None

Associated Goals

- 3. Efficiency

Associated Objectives

- Develop a long-term strategy for a new Statewide Traffic Management Center

Description:

- Before a new stand-alone TMC facility is constructed in the future, there are interim steps that are needed to improve the functionality of the existing facility and meet the needs of new initiatives like variable speed limits and hard shoulder running.

Critical Steps:

1. If space permits, it is suggested to install or add the following resources during the upgrades to the existing TMC:
 - Ergonomic and climate control workstations for all operators.
 - Two to four additional workstations.
 - One conference/situation room with view of control room floor.
 - Two to three supervisor offices with view of control room.
 - Third shift supervisor.
2. Hire a dedicated IT technologist to provide life cycle support and become a software subject matter expert. Develop control software that integrates the traffic signal system and ITS devices into one network to monitor device performance and for data collection.
3. Acquire control software that allows for near-term deployments of variable speed limits, hard shoulder running lane control, and truck parking information systems.
4. Develop decision matrices for VSL and HSR.
5. As ODOT makes the shift from traffic monitoring to traffic management (i.e. VSL and HSR), designate a staff member to maintain and update procedural manuals so that TMC staff can be provided with the most current and accurate Standard Operating Procedures.
6. Create an Information Sharing Working Group to establish a list of offices within ODOT and partner agencies that need to exchange data and develop procedures for how the information is exchanged and how frequently.
7. Formalize and structure a training program to train both new and existing staff on TMC operation components in detail from design and deployment to operations and maintenance.
8. Actively participate in the Asset Management Working Group to develop a checklist of ITS field hardware and develop procedures for how to evaluate the working condition and how to initiate the work order process when necessary.
9. Develop performance metrics to measure the success of traffic operations, create performance reports, and disseminate the information to the public and internal and external stakeholders.
10. Explore read/write access with external agencies through the IT group to determine how much information ODOT can share externally while respecting IT/security policies. Focus on signal timing/coordination. Developing standard maintenance/operations agreements/blanket legislation would be useful as well to address these types of issues.

Benefits, Impacts, Outcomes:

- Addressing current TMC needs will improve inter-agency relationships (with SHP, DPS, etc.)
- Will reduce response time to incidents with training.
- Timely notification to TMC operators of abnormal system or equipment failures.
- With new performance metrics enabled, the TMC can identify positive and negative operating trends for further analysis, and track operational goals.
- Enhancements to TMC functional uptime, future software and hardware procurements, and TMC staff training.

BP6. Develop a four-year TSMO Program Plan with funding sources and identified budgets.

Priority: Tier 1

- Status: To Be Scheduled
- Duration: 6 months

Lead Offices

- Central Office
- Districts

Supporting Offices

- Traffic Operations
- Program Management
- Information Technology
- Capital Program Management

Resources Needed

- Staff time to establish review and approval process and update on an annual basis.

Dependencies

- BP1
- BP3
- BP7
- ST4
- CO2

Associated Goals

- 5. Coordination
- 6. Integration

Associated Objectives

- Align ODOT Operations Budgeting with other longer-term programs.
- Integrate TSMO into existing ODOT Policies, Plans, and Procedures.

Description:

- Historically, budgeting for TSMO activities has been performed on an ad hoc, annual basis at ODOT.
- Districts currently utilize “other” capital funds or operations funding (4CP/200) to implement TSMO activities. This funding varies on an annual basis and across Districts.
- Establishing a longer-term program plan, similar to other programs at ODOT, will further legitimize the proposed investment in TSMO and yield measurable benefits.

Critical Steps:

1. Define Program Activities, Policies, Procedures, and Projects to be completed over the next four years (part of TSMO Plan development).
2. Incorporate into annual work plan.
3. Map out TSMO funding stream from Pro Forma to program plan to District work plans. TSMO Council needs to understand scope of existing expenditures before prioritizing future expenditures.
4. Identify existing and potential future funding sources including P3 and collaboration with MPOs/RTPOs and Locals.
5. Present draft four-year Plan to TSMO Council.
6. Present TSMO funding proposal to the Funding Council for consideration on Pro Forma.

Benefits, Impacts, Outcomes:

- Promotes ODOT network preservation priorities (manage and optimize use of its existing resources).
- Allows for deliberate planning for multi-year, phased projects, such as Next Generation ATMS.
- Program plan provides more assurance that critical programs will be funded year-to-year.
- Creation of a TSMO Program Plan with an associated budget will enable TSMO to be considered an equal to other programs at ODOT and will allow for better long-term planning.
- Will emphasize TSMO’s importance to non-operations oriented staff.



BP8. Develop TSMO policies, procedures, and guidance documents.

Priority: Tier 2

- Status: To Be Scheduled
- Duration: 12 months

Lead Offices

- Central Office

Supporting Offices

- Traffic Operations
- District HMAs
- District TSMO Coordinators

Resources Needed

- Staff time

Dependencies

- None

Associated Goals

- 6. Integration

Associated Objectives

- Integrate TSMO into existing ODOT Policies, Plans, and Procedures.

Description:

- There are a number of policy, procedure, and guidance documents needed to start institutionalizing TSMO throughout ODOT.
- Considering TSMO applications during the PDP (BP3) could be formalized into a required step for all projects.
- Standard benefit/cost analysis for TSMO strategies (ST6) could be required for all projects.
- District-level guidance on TSMO implementation will also be important to ensure the program's widespread use.

Critical Steps:

1. Convene a group of ODOT staff to audit existing ODOT policies, procedures, and guidance documents and assess specific areas of opportunity.
2. Develop prioritized list of policies, procedures, and guidance documents that will benefit from enhanced TSMO integration.
3. Assign teams of 2-3 people to develop draft documents.
4. Allow the TSMO Council to review draft documents.
5. Establish expedited review and approval process.
6. Develop and deliver TSMO training materials.

Benefits, Impacts, Outcomes:

- Integration of TSMO into policies, procedures, and guidance documents will lay the foundation to improve business processes.
- TSMO culture will propagate throughout ODOT as new policies, procedures, and guidance documents are delivered, including sustained awareness activities.

**OS1. Establish TSMO job descriptions and classifications, including new TSMO-oriented career paths, retention, and succession plans.****Priority: Tier 1**

- Status: In Progress
- Duration: 12 months

Lead Offices

- Central Office

Supporting Offices

- Traffic Operations
- Human Resources
- Employee Development and Lean

Resources Needed

- Staff time

Dependencies

- OS2
- OS5
- OS3

Associated Goals

- 5. Coordination

Associated Objectives

- Develop staffing strategies to improve organizational efficiency.

Description:

- As technology continues to rapidly change, so does the need to match skills with emerging TSMO needs.
- Historically, ODOT and other DOTs have relied heavily on hiring civil engineers.
- There is a growing need to employ electrical/communications engineers, computer/data analysts, and GIS professionals.
- Determining updated salary structures that compete with the private sector, establishing career paths, improving retention practices, and proactive succession planning are all connected with updating ODOT's approach to attract a highly skilled TSMO workforce.
- Recent activities have included updating position descriptions for TMC operators and beginning to succession plan as a large number of ODOT staff will be eligible for retirement in the next two years.
- Over time, almost all ODOT positions will be modified to support TSMO. Position descriptions will have to be adjusted even if statewide classifications are not changed.

Critical Steps:

1. Assess staffing needs based on any proposed organizational changes. Begin with TMC as they are currently short staffed on third shift (by one person), which poses a safety issue.
2. If desired, consult federal guidelines on TMC position descriptions: https://tmcdfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/tmc_opreq_pds.pdf or use best practices from other DOTs.
3. Work with Human Resources and DAS to modify existing and create new position descriptions.
4. Develop a range of retention strategies (e.g., small, one-time spot bonuses for exemplary work, supplemental training, endorsed participation in professional societies, challenge coin recognition, etc.).
5. Modify ODOT's recruitment plans to attract new workforce (i.e. data analysts, systems managers, etc.).
6. Formalize succession planning for known positions that will likely be vacated over the next 2-4 years.

Benefits, Impacts, Outcomes:

- Better ability to attract and retain high quality work force.
- ODOT will be better prepared to respond to and support emerging technologies (e.g., CV/AV, big data analytics, ATMS software troubleshooting, Smart Cities, etc.).
- To realize the benefits of attracting and retaining new TSMO professionals, ODOT will likely need to pay significantly higher salaries to fill key positions.
- As a leader in TSMO workforce development, be prepared for the ODOT workforce to be targeted hires by external partners and the private sector. Plan/train positional backups, especially in critical TSMO systems or areas.



OS5. Develop sustainable TSMO training program for ODOT.

Priority: Tier 2

- Status: To Be Scheduled
- Duration:
 - Initial Development: 12 months
 - Delivery: Ongoing

Lead Offices

- Districts Business and Human Resources
- Central Office

Supporting Offices

- District TSMO Coordinators
- Local Programs
- Consultant Services

Resources Needed

- Staff time to create training curricula and operate program

Dependencies

- BP8
- OS2
- OS3

Associated Goals

- 5. Coordination

Associated Objectives

- Engage all ODOT disciplines and external partners to proactively manage and operate the transportation system.

Description:

- To accelerate the implementation of TSMO, ODOT should develop internal training to educate all levels of ODOT on the shift to a TSMO focused organization.
- Training should be periodically updated to incorporate the latest developments, best practices and technologies available.
- Once ODOT has established a TSMO Training Program internally it could then consider extending TSMO training to external partners.

Critical Steps:

1. Develop train the trainer training for TSMO Coordinators and TSMO subject matter experts within ODOT.
2. District TSMO Coordinators, in collaboration with Central Office staff and other TSMO-related personnel, will conduct training for ODOT staff. Training may include topics such as:
 - TSMO focused Workforce development (OS1).
 - A project management training module should be developed to help project managers integrate TSMO into their projects (BP3).
 - TSMO guidance (BP8).
 - Traffic Incident Management (CO4).
 - TSMO resources (BP1).
 - Planning and design of TSMO projects (BP4, BP7, ST4).
 - Performance measurement (PM1, PM2, PM3).

Future External Training options:

- District TSMO Coordinators work with Office of Local Programs to contact external partners interested in TSMO trainings.
- Trainings could rotate throughout the Districts and around the state.
- Tailor training curricula to match local circumstances (e.g., urban vs. rural). Focus on major metro areas because they rely on a large portion of ODOT's critical assets.
- Work with Office of Consultant Services to include TSMO training as part of consultant prequalifications for TSMO-related contracts.
- External trainings could be run through LTAP.

Benefits, Impacts, Outcomes:

- Establishes TSMO knowledge at all levels of ODOT.
- Will accelerate TSMO related culture shift within ODOT.
- Future - Extending TSMO culture and knowledge to external partners will increase the program's efficiency and amplify its impacts.
- Future - Reduced congestion on local roads and better managed local operations will have a positive impact on ODOT operations.



CU1. Integrate TSMO in the guiding documents of the Department (ODOT Business Plan, Strategic Plan).

Priority: Tier 1

- Status: In Progress
- Duration: 12 months

Lead Offices

- Central Office

Supporting Offices

- Statewide Planning and Research
- Communications
- Districts
- Capital Program Management

Resources Needed

- Staff time

Dependencies

- BP3
- BP7
- BP8

Associated Goals

- 6. Integration

Associated Objectives

- Integrate TSMO into existing ODOT Policies, Plans, and Procedures.

Description:

- One of the hallmarks of integrating TSMO includes strengthening language in guiding documents, such as Strategic Plans and Business Plans.
- Opportunities include Access Ohio Long-Range Transportation Plan, ODOT Strategic Plan, the Statewide Transportation Improvement Program (STIP), and the Annual Report with 2-Year Business Plan.
- On occasion, TSMO activities have been listed in the Annual Report (e.g., OHGO), but there is an opportunity to strengthen the guiding documents to demonstrate the Department's long term commitment to TSMO.

Critical Steps:

1. Include TSMO as part of Access Ohio 2045 update.
2. More explicitly reflect TSMO in the Department's Strategic Plan, 2-Year Business Plan, and STIP/TIPs.
3. Coordinate with MPOs to include TSMO in ITS Architecture and/or MPO Plans.

Benefits, Impacts, Outcomes:

- By integrating TSMO into guiding documents, internal and external stakeholders will better understand ODOT's commitment to TSMO.
- "Trickle-down" benefits will enable other proposed TSMO business process improvements.
- Encourages TSMO culture.
- Accelerates departmental shift toward operations.
- Long Range Plan updates.



CU2. Develop and maintain a TSMO business case report with Ohio data.

Priority: Tier 1

- Status: In Progress
- Duration: 12 months

Lead Offices

- Central Office

Supporting Offices

- Traffic Operations
- Statewide Planning and Research
- Communications
- Technical Services
- Asset Inventory and Systems Integration
- Capital Program Management

Resources Needed

- Staff time
- Research staff time
- \$100,000

Dependencies

- ST6
- PM2
- PM1
- CO6

Associated Goals

- None

Associated Objectives

- None

Description:

- There are a number of national statistics that help make a compelling case why DOTs should be more TSMO-oriented.
- Using Ohio-specific data furthers the business case for TSMO, especially when coupled with the most readily available data, including forecast projections.
- Areas that could be considered include:
 - Sources of congestion.
 - Clearance times.
 - Work zone delays.
 - Freight related econometrics.
 - Safety trends.
- The business case should summarize performance of the program based on the reported statistics, including TSMO activity and its impact on the overall transportation network.

Critical Steps:

1. Engage resources to develop business case framework and associated infographics that can be updated on a routine basis.
2. Identify performance measures to feed the business case.
3. Work with regional partners to ensure the availability of relevant data.
4. Develop and track performance measures.
5. Promote the TSMO business case with internal and external partners to continue building support.
6. Use FHWA's Tool for Operations Benefit Cost Analysis (TOPS-BC) to compute program benefits and costs to the motoring public:
<https://ops.fhwa.dot.gov/plan4ops/topsbctool/>
7. Include elements of business case in Long Range Transportation Plan.

Benefits, Impacts, Outcomes:

- Having up to date business case information will help address questions related to projected growth in the TSMO Program.
- The business case will become talking points for executives that need to report to the legislature and other constituents.
- Will provide Ohio-specific data and results to justify investment in TSMO.
- TSMO data will lead to benefit/cost analysis for the program.

AADT — Annual Average Daily Traffic	OSIS — ODOT Signal Inventory System
AASHTO — American Association of State Highway Transportation Officials	PDP — Project Development Process
ATDM — Active Transportation Demand Management	PIP — Project Initiation Package
ATMS — Advanced Traffic Management Systems	PM — Performance Measurement (Capability Maturity Model dimension)
BP — Business Processes (Capability Maturity Model dimension)	Pro Forma — ODOT's revenue program forecasting tool
CCTV — Closed Circuit Television	QuickClear — ODOT's traffic incident management program
CMAQ — Congestion Mitigation and Air Quality	R&D — Research and Development
CMM — Capability Maturity Model	RPO — Regional Planning Organization
CO — Central Office	RTPO — Regional Transportation Planning Organization
CO — Collaboration (Capability Maturity Model dimension)	RWIS — Roadway Weather Information System
ConOps — Concept of Operations	SHP — State Highway Patrol
COTS — Commercial off the shelf	DPS — Department of Public Safety
CSF — Critical Success Factors	SEA — Systems Engineering Analysis
CU — Culture (Capability Maturity Model dimension)	SOP — Standard Operating Procedure
CV/AV — Connected Vehicles/Autonomous Vehicles	SPaT — Signal Phasing and Timing
DDMS — Destination Dynamic Message Sign	ST — Systems and Technology (Capability Maturity Model dimension)
DMS — Dynamic Message Sign	STIP — Statewide Transportation Improvement Program
DOT — Department of Transportation	STSMO — AASHTO's TSMO Subcommittee
DSRC — Dedicated Short Range Communications	SWOT — Strengths, Weaknesses, Opportunities and Threats
EIMS — Equipment & Inventory Management System	TAC — Technical Advisory Committee
ELC — Executive Leadership Committee	TAMP — Transportation Asset Management Plan
EM — Emergency Management	TIM — Traffic Incident Management
GBDAA — Ground Based Detect and Avoid	TIMS — Transportation Information Management System
GIS — Geographic Information Systems	TIP — Transportation Improvement Program
HAR — Highway Advisory Radio	TMC — Traffic Management Center
HMA — Highway Management Administrator	TOAST — Traffic Operations Assessment System Tool
HOV — High Occupancy Vehicle	TOPS-BC — Tool for Operations Benefit Cost Analysis
ICM — Integrated Corridor Management	TPIMS — Truck Parking Information Management System
ITE — Institute of Transportation Engineers	TRB — Transportation Research Board
ITS — Intelligent Transportation Systems	TRIP — ODOT's Towing and Recovery Incentive Payment Program
IWZ — Intelligent Work Zones	TSMO — Transportation Systems Management and Operations
LED — Light-emitting diode	TSMO Council — ODOT group that would collaborate on program policies and goals as well as provide recommendations to executive leadership regarding expenditures and organization, and report on the progress of TSMO implementation.
LTAP — Local Technical Assistance Program	TTRI — Travel Time Reliability Index
MAASTO — Mid America Association of State Transportation Officials	UAS — Unmanned Aircraft Systems
MAP-21 — Moving Ahead for Progress in the 21st Century Legislation	UAS Center — Unmanned Aircraft Systems Center (ODOT)
MPO — Metropolitan Planning Organization	UTM — Unmanned Aircraft Traffic Management
NCHRP — National Cooperative Highway Research Program	VSL — Variable Speed Limit
NTPEP — National Transportation Product Evaluation Program	WIM — Weight In Motion
ODOT — Ohio Department of Transportation	
OHGO — ODOT's real-time traffic information mobile app	
OS — Organization and Staffing (Capability Maturity Model dimension)	