



TRANSPORTATION
CABINET

TSMO

BUSINESS PLAN

Transportation Systems
Management and Operations

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TSMO Program Plan

The KYTC TSMO Program Plan sets the vision and objectives for TSMO, provides a framework to guide TSMO actions and activities, lays out an organizational model, identifies actions to improve the TSMO program's function, and recommends strategies for implementation.

The TSMO Program Plan consists of three parts:

- **Strategic Plan:** Presents the rationale for a KYTC TSMO Program and establishes a set of TSMO strategic objectives that support KYTC's goals.
- **Business Plan:** Identifies business processes and organizational improvements needed to manage the TSMO program and implement TSMO strategies.
- **Implementation Plan:** Presents a set of strategies (projects, service, activities) to realize the strategic objectives as well as performance objectives of the transportation network.



STRUCTURE OF THE TSMO BUSINESS PLAN

This document is the TSMO Program Plan's Business Plan. It is the result of assessing KYTC's TSMO Program from a business process and organizational perspective. The business plan suggests actions to advance the program's effectiveness and implement the TSMO strategic objectives in three key areas: the TSMO Program's foundation, relationship to KYTC's capital program, and other business processes. These actions address TSMO program development, support, and understanding; workforce roles and development; TSMO planning, programming, and project development; and internal and external coordination and collaboration.

The plan articulates steps to accomplish each action that can be further developed at the appropriate time into specific work activities with staff responsibilities, timeframes, and resources. All actions and steps are illustrated in a Roadmap for KYTC TSMO Program showing a sequence, relative durations, and dependencies among actions and steps.

LINKING STRATEGIC OBJECTIVES TO ACTIONS

The Business Plan actions are the result of a deliberate process to collaboratively identify how the KYTC TSMO Program would evolve and improve over the next five years to achieve the TSMO strategic objectives. The strengthened TSMO Program would also support the development of TSMO projects, services, and activities in the Implementation Plan.

To ensure that the actions in the business plan represent the priorities of the Cabinet and are the most prudent use of resources, their development and confirmation followed a process consisting of:

Brainstorming and refining actions that directly align with the TSMO strategic objectives using initial observations and KYTC leadership input on the existing TSMO program.

Augmenting the initial list of actions with observations and suggestions from the “Advancing TSMO in Kentucky: A Capability Maturity Self-Assessment Workshop” held in March 2019.

Holding three workshops with a multidisciplinary stakeholder group to discuss, assess, and adjust the actions such that they represent the collective priorities and judgment of key KYTC staff and external partners. Attendees at these workshops represented the following organizations:

- FHWA-KY
- OKI MPO
- KIPDA MPO
- TRIMARC
- KYTC Business Units:
 - » Division of Maintenance
 - » Office of Public Affairs
 - » Office of Information Technology (OIT)
 - » State Highway Engineer’s (SHE) Office
 - » Division of Planning
 - » Division of Incident Management
 - » District 5
 - » District 7

TSMO Program Actions and Categories

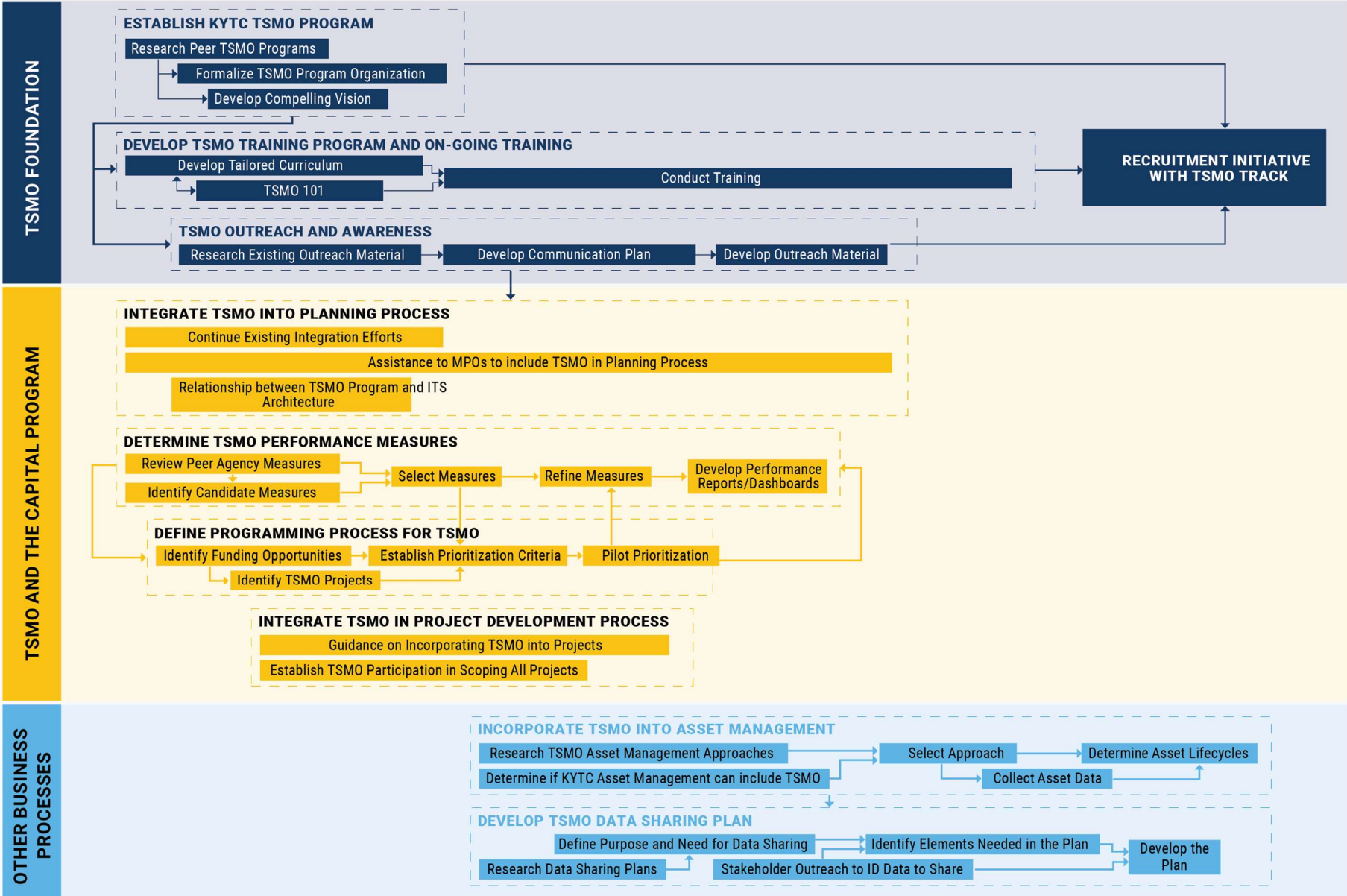
The business plan actions are presented below in a TSMO Program Roadmap that shows the sequence of actions and the dependencies among them. It is divided into three categories of actions:

- **TSMO Foundation** – establishing the TSMO program, developing and conducting TSMO training, performing outreach and awareness activities, and developing a recruitment initiative with a TSMO track.
- **TSMO and the Capital Program** – integrating TSMO into the planning process, defining a programming process for TSMO, integrating TSMO into the project development process, and determining a set of TSMO performance metrics.
- **Other Business Processes** – incorporating TSMO in asset management and developing a TSMO data sharing plan.

The roadmap shows the program actions in each category as well as the supporting steps. Dependencies are indicated with arrows. Sequencing and durations are relative.

In the sections that follow organized by category, each action and its respective steps are detailed alongside a standalone roadmap of that category.

Roadmap for KYTC TSMO Program

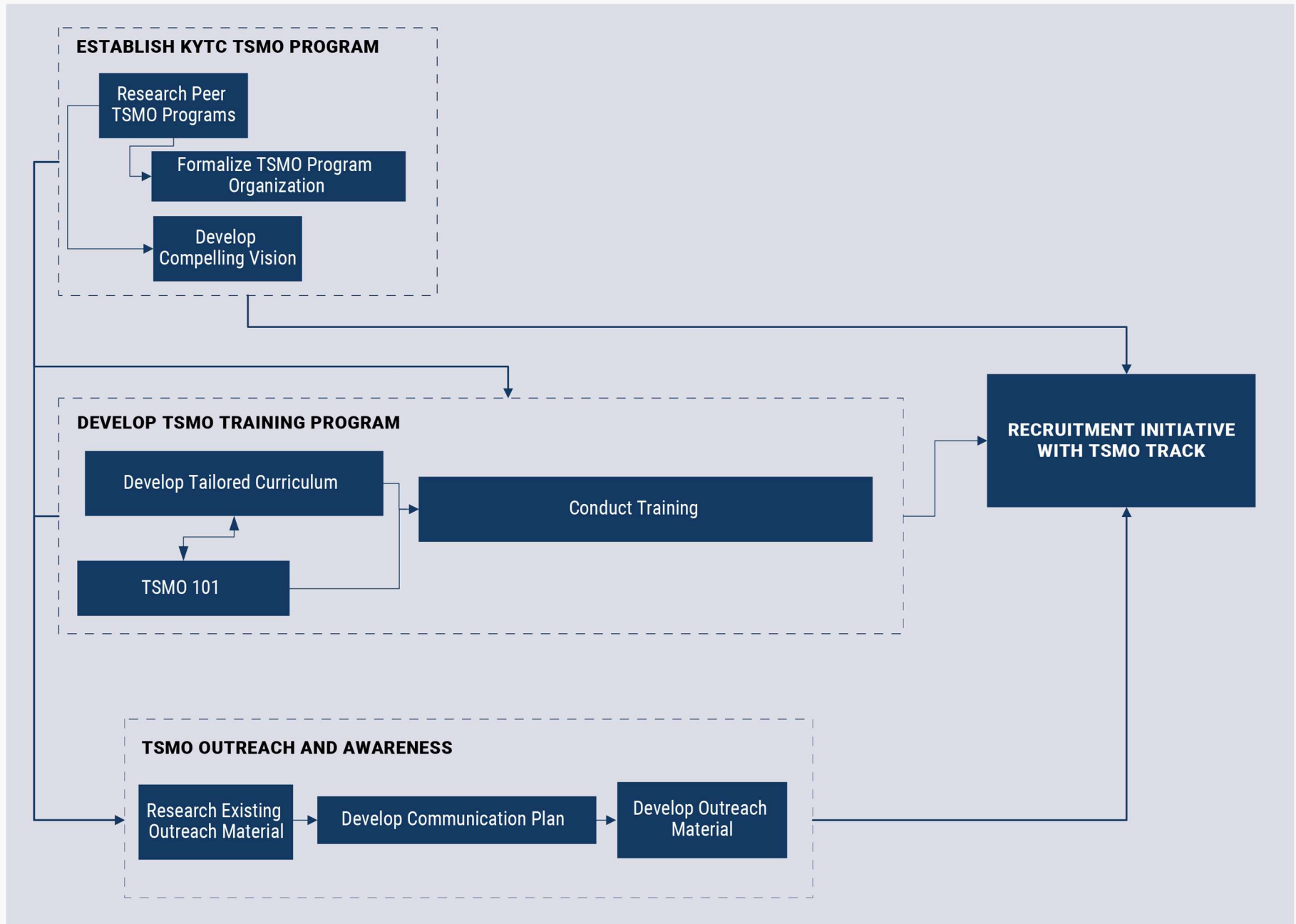


TSMO FOUNDATION

The TSMO Foundation category includes actions that are fundamental to forming and maintaining a TSMO program. These actions provide a structure within KYTC that will continue to make TSMO an integral part of its operations. They will also build knowledge of TSMO, the TSMO program, TSMO strategies, and the role TSMO has within the Cabinet. They will provide awareness of TSMO with external stakeholders. Finally, this category includes developing a recruitment initiative to attract staff to KYTC to work on TSMO related tasks and strategies.

These actions will support actions in the “TSMO and the Capital Program” category. TSMO training and outreach and awareness will help integrate TSMO in the planning process and project development process, including maintenance and operations, by educating staff from KYTC and other agencies about TSMO and how it can help meet the goals and objectives or purpose and need of projects in all stages of the project lifecycle. The TSMO foundation actions will help staff think about TSMO strategies as they plan, program, and develop projects in all funding categories.

Roadmap for KYTC TSMO Program - TSMO Foundation



Establish the KYTC TSMO Program

FHWA defines a TSMO program as “the organizational structure and mechanisms needed to deliver the vision, mission, and strategic goals and objectives for advancing TSMO in an organization.”¹ The program consists of a “coordinated, interrelated set of strategies, procedures, and activities (such as projects), all intended to meet the goals and objectives articulated in vision statements and policies.” In short, a TSMO program provides the supporting processes and structure within a transportation agency to make TSMO an integral aspect of the agency. The TSMO program can then effectively contribute to meeting agency mission and goals.

The KYTC TSMO Strategic Plan identified the need to establish a formal TSMO program. Establishing a formal TSMO program was discussed in a series of business planning workshops with stakeholders that rated establishing a KYTC TSMO program as the highest priority action to improve TSMO in the Cabinet.

KYTC currently has pieces of a TSMO program in place: ITS elements with an operations center, traffic signal management, operational improvement projects (e.g., turning pockets and auxiliary lanes), enhanced signing, pavement markings, high friction surface treatments, and funding paired with on-call contracts to operate and expand these strategies. Capital program funding is also dedicated to improving the operation of the transportation network. The steps described below will help to formalize the TSMO program within KYTC.

Recommended Steps to Establish the KYTC TSMO Program

RESEARCH PEER TSMO PROGRAMS

- Identify and consider peer TSMO program structures to inform the selection of program elements, organization, and processes for a KYTC TSMO program.
- Adapt select findings to KYTC so that a program structure is defined on an incremental basis

FORMALIZE THE TSMO PROGRAM ORGANIZATION

- Define a TSMO organizational model to include:
 - » KYTC TSMO Leadership Team/Steering Committee consisting of an executive-level TSMO lead and multidisciplinary group
 - Consider developing a charter for the Leadership Team/Steering Committee to document the purpose, membership, and activities of the team/group
 - Define roles and responsibilities of the team/stakeholder group.

¹ Developing and Sustaining a Transportation Systems Management & Operations Mission for Your Organization: A Primer for Program Planning. FHWA-HOP-17-017. <https://ops.fhwa.dot.gov/publications/fhwahop17017/index.htm>

- Provide the “vision” for the TSMO program and recommendations on initiatives and processes that support achieving the TSMO strategic objectives
 - Meet as needed to discuss TSMO program plan progress, industry developments, needs, priorities, TSMO performance metrics, etc.
 - Actively support and participate in TSMO awareness and outreach activities
- » Create a staffing plan for TSMO that identifies key needs and organizational issues

DESCRIBE A COMPELLING KYTC TSMO PROGRAM

- Develop a description of the planned TSMO program and its integration into existing KYTC practices. Identify the benefits of the program.
 - » Describe how the TSMO program will operate within KYTC to accomplish the vision.
- Ensure the description speaks to those who have no prior experience with TSMO, why it should be understood and incorporated into their work as relevant, and how that is accomplished.
- Ensure this description includes a focus on the benefits to safety.

Training

Training is a critical element in any discipline. It is especially important because TSMO is by nature multidisciplinary. There are no degree or certification programs in TSMO so staff must be trained. On the job training is the most common type of training for TSMO professionals. However, there are training resources available that can raise awareness and provide knowledge on a wide variety of TSMO-related topics.

TSMO training is important to KYTC because, like at many transportation agencies, TSMO traditionally was not a core program within the Cabinet. Many staff have more than a passing knowledge of TSMO, although they may simply know it as something else, like Operational Improvements, Performance Based Flexible Solutions, Value Engineering, or Safety Improvements (e.g., innovative intersections). Even so, an effective training program will be one of the pillars of a strong TSMO program, and this action will develop a training program for KYTC.

There are several sources of TSMO training material around the country. These include the FHWA/AASHTO Regional Operations Leadership Forums (ROLF), the Operations Academy™, ITS Heartland, FHWA and the USDOT Joint Program Office, the National Highway Institute, and the Consortium for Innovative Transportation Education (CITE). Exhibit A below provides a partial list of the training available and a brief description of each program. These sources can be leveraged for the KYTC training program. That program will be based on a curriculum tailored to KYTC needs. Within that curriculum,

there will be individual tracks developed for and tailored to various disciplines within KYTC.

Recommended Training Steps

DEVELOP TAILORED TRAINING CURRICULUM

- Investigate and catalog available training resources. Examples include those shown below in Exhibit A.
 - » Note what positions these courses would be suited for.
 - » Note: The Director of the National Operations Academy is interested in making the Academy pre-study material available. There is a wide range of options, including tailoring the material to KYTC, facilitated discussions after the self-study, etc.
- Develop curriculum tailored by position type (design, maintenance, traffic, planning, etc.)
 - » Describe each course
 - » Include recommended sequence

DEVELOP KYTC “TSMO 101” TRAINING COURSE

- Introductory course to explain what TSMO is and how it fits in KYTC
- Develop based on existing introductory courses
- Integrate KYTC activities and the TSMO Program Plan
- Pilot the TSMO 101 training

EXHIBIT A. National TSMO Training Resources

TRAINING RESOURCE	DESCRIPTION
<u>Operations Academy™ Senior Management Program</u>	Two-week immersion course on a wide range of skills for TSMO managers hosted by the University of Maryland. Useful for not only training content but also establishing peer networks and career-long learning
<u>Consortium for Innovative Transportation Education (CITE)</u>	Web-based, introductory and advanced TSMO training courses and certificate programs
<u>Regional Operations Forums and Regional Operations Leadership Forums</u>	FHWA-sponsored course focused on strategies, technologies, and practices for improving TSMO organized by audience and timeframe
<u>ITS Heartland TSMO University</u>	Collection of resources aimed at expanding TSMO knowledge for public and private practitioners maintained by the ITS Heartland Chapter of ITS America
<u>USDOT ITS JPO Professional Capacity Building Program (PCB)</u>	Free online training on systems engineering, ITS architecture, ITS standards, and other aspects of intelligent transportation systems

TRAINING RESOURCE	DESCRIPTION
<u>ITS Cybersecurity Workforce Development</u>	Compilation of training resources specific to ITS cybersecurity available through the ITS PCB and CITE
<u>FHWA National Highway Institute</u>	Catalog of courses on a variety of transportation topics, some of which are focused on operations. Many courses are free or low-cost to public agencies
<u>NOCoe On-Demand Learning</u>	Catalog of recorded webinars, case studies, peer exchanges and other training on transportation operations

Source: AASHTO Transportation Operations Manual (forthcoming).

CONDUCT TRAINING

- Implement the curriculum by making the training courses available to staff and supervisors.

Outreach and Awareness

Understanding and awareness of TSMO within KYTC, among partner agencies, and the public will help build interest in and support. An outreach and awareness program will explain what TSMO is, why it's important, and what its benefits are. Awareness within KYTC will make TSMO more understandable and attractive to staff, which in turn will make it easier to attract staff to become TSMO champions. Awareness of TSMO will also make it easier to incorporate into projects across the KYTC capital programs.

Outreach to partner agencies will provide rationale for why these agencies should invest in TSMO. They will also better understand why KYTC implements TSMO strategies, which will improve coordination and collaboration.

Outreach to the public will show that KYTC is innovative and looks to using a broad set of tools to address transportation issues in Kentucky. It will build support within the general public.

Like training material, there are national resources that include examples of outreach material that KYTC can leverage for an outreach and awareness program. Exhibit B below explains some of the resources available through FHWA. In addition, reaching out to the Operations Academy™ listserv and the AASHTO Committee on Transportation System Operations (CTSO) will bring more examples of outreach programs.

Recommended Outreach and Awareness Steps

RESEARCH EXISTING OUTREACH MATERIAL

- Suggest what material might be used within in KYTC
- Determine how to utilize and tailor material. Determine if any can be used before the communication plan is developed.

- FHWA has material on their website, including examples from agencies, that could be the basis for this investigation (See Exhibit B).

EXHIBIT B. FHWA TSMO Outreach Resources

FHWA COMMUNICATING TSMO RESOURCES

Gaining buy-in and collaboration for TSMO among different units and programs within an agency, and with external partners, usually requires effective ongoing outreach and communication. The FHWA webpage on [Communicating TSMO](#) is available to help agencies build support for TSMO.

Resources include a TSMO outreach kit, developed in collaboration with AASHTO, that is geared toward leadership. It includes a brochure, talking points, testimonials, and FAQs.

Other resources include a [series of factsheets on communicating TSMO to other programs](#), a business case primer, presentation materials, state DOT deployments success story publications and videos.

Source: AASHTO Transportation Operations Manual (forthcoming).

DEVELOP COMMUNICATION PLAN WITH OFFICE OF PUBLIC AFFAIRS

- Include a variety of audiences, including:
 - » Internal technical staff
 - » Engineering Branch Managers in Central Office and District Offices
 - » Executive Staff
 - » FHWA Kentucky Division staff
 - » External agency technical staff
 - » External agency decision-makers
 - » The public and media
- Consider timeframe for each audience. Focus initially on developing material that is general in nature and can be developed or adapted quickly. More detailed material can be developed as needed after the initial material.

DEVELOP MATERIAL TO SUPPORT THE PLAN

- Utilize/adapt existing material as possible.
- Prioritize the material to be developed.

Develop Recruitment Initiative with TSMO Track

Attracting staff in today's environment is challenging in almost any field. It is particularly challenging in technical fields, like engineering, data science, and planning. It can be

especially challenging for public agencies because pay often lags behind private sector employers, and compensation in the transportation sector traditionally lags behind other technical disciplines.

For these reasons, it is critical to develop a recruitment initiative that will emphasize the benefits of a career with KYTC. Some of the advantages that other public sector agencies emphasize are:

- Flexibility in working conditions
- Work-life balance
- More generous holidays and time off
- Making a difference to society

There are many others. These advantages can be specifically tailored to KYTC and articulated in a recruitment plan that can be developed in cooperation with the Office of Human Resource Management (OHRM).

Recommended Step to Develop a Recruitment Initiative with TSMO Track

WORK WITH HR TO DETERMINE HOW TSMO RECRUITMENT CAN PROCEED

The recruitment effort can fit into Cabinet recruitment efforts overall. The idea is to show there is a TSMO program in KYTC and there are opportunities to work and progress in TSMO in KYTC.

- Reflect the KYTC TSMO program
- Leverage training material
- Leverage outreach and awareness material
- Consider/continue intern programs, including for STOC (Statewide Transportation Operations Center) and TRIMARC (Traffic Response and Incident Management Assisting the River City)
- Partner with universities
 - » Include colleges with a focus on underrepresented groups

TSMO AND THE CAPITAL PROGRAM

The TSMO and the Capital Program category includes actions that will help incorporate TSMO strategies in transportation programs in KYTC and other transportation agencies in Kentucky. These actions provide ways to incorporate TSMO strategies in the planning process, the capital programming process, and the project development process. In short, actions in this category help to get TSMO projects identified, funded, and developed.

The keys to this category are for TSMO staff to understand the planning and programming processes and to involve TSMO consideration in each step and decision-making process. Actions in this category are also aimed at incorporating TSMO strategies in the project development process by providing guidance on how to meet project purpose and need with TSMO strategies and how to include TSMO strategies in Performance Based Flexible Solutions.

Roadmap for KYTC TSMO Program - TSMO Foundation

INTEGRATE TSMO INTO PLANNING PROCESS

Continue Existing Integration Efforts

Assistance to MPOs to Include TSMO in Planning Process

Relationship Between TSMO Program
and ITS Architecture

DETERMINE TSMO PERFORMANCE MEASURES

Review Peer Agency Measures

Identify Candidate Measures

Select Measures

Refine Measures

Develop Performance
Reports/Dashboards

DEFINE PROGRAMMING PROCESS FOR TSMO

Identify Funding Opportunities

Establish Prioritization Criteria

Pilot Prioritization

Identify TSMO Projects

INTEGRATE TSMO IN PROJECT DEVELOPMENT PROCESS

Guidance on incorporating TSMO into projects

Establish TSMO Participation in scoping all projects

Integrate TSMO into the Planning Process

The TSMO Strategic Plan includes an objective to: “Integrate potential TSMO strategies and actions into the development process for capital projects to make the most informed investments.” The first step is to integrate TSMO into the planning process.

A strong TSMO program relies on implementing TSMO strategies, generally through projects that are identified in the planning process. TSMO tactics also support performance outcomes and performance-based planning. Including TSMO projects and strategies in other projects strengthens the TSMO program and it provides cost-effective ways to meet agency goals and provides ways to apply performance-based planning.

It is important to integrate TSMO in both the KYTC planning process and the regional/metropolitan planning organization (MPO) planning processes. Every MPO plans for and programs transportation projects. TSMO can support an MPO’s goals. It is important that MPOs are familiar with the TSMO mindset, strategies, and how it can meet their transportation goals. The steps below will further the integration of TSMO into the planning processes in Kentucky.

Recommended Steps to Integrate TSMO into the Planning Process

CONTINUE TO INTEGRATE TSMO INTO KYTC PLANNING PROCESSES

- Examine peer examples and processes for consideration
 - » Coordinate effort with research for the Establish the TSMO Program action.
- Identify TSMO projects by developing a TSMO implementation plan that identifies potential TSMO strategies, services, and activities for implementation
- Ensure TSMO strategies are included in transportation improvement concepts in planning studies
- Establish coordination and alignment with other relevant KYTC and partner plans, including the Long-range Statewide Transportation Plan (LRSTP), MPO plans, and the Strategic Highway Safety Plan (SHSP).
 - » Ensure the project manager/project team for each plan is familiar with the TSMO program plan (at a minimum, its strategic objectives, programmatic recommendations, benefits, and recent outcomes at the time of the start of the planning process).
 - » Explicitly map out where the plan in question and the TSMO program plan’s objectives are shared.
 - » Designate a TSMO liaison to participate in key plan development milestones and/or meetings as determined.

Provide assistance to MPOs to include TSMO in their planning processes

- Prepare white paper/information sheets on what MPOs need to know about TSMO
- Identify peer examples and processes for consideration on how other DOTs inform MPOs, especially about the congestion management process (CMP)
- Use the above materials to encourage MPOs to incorporate TSMO into their planning processes

ARTICULATE THE RELATIONSHIP BETWEEN THE TSMO PROGRAM AND THE STATEWIDE ITS ARCHITECTURE

- Research peer examples and processes of TSMO program and ITS architecture linkages.
- Develop examples of how to use the architecture to support TSMO related tasks.

Define a Programming Process for TSMO

Project programming is the process used to select projects for funding and is an essential step in implementing capital projects.

There are various funding sources that can be used for TSMO strategies and projects. TSMO strategies can be implemented by incorporating them in larger capital projects, like Ohio River Bridges. They can also be funded as separate, standalone projects. In either case, TSMO projects need to be identified, analyzed, and selected for funding. Funding sources include Federal grants, Congestion Mitigation and Air Quality (CMAQ) funds, Highway Safety Improvement Program (HSIP) funds, state (ZVARIOUS) funds and other capital project funding categories.

Ideally, TSMO projects will be identified based on needs identified in a variety of ways, including planning studies, field observations and experience, and input from stakeholders. Once the projects are identified and defined, there needs to be a process to prioritize the projects and then determine the best ways to fund the high priority projects. Once the funding category is identified, the projects will need to compete in those categories through the programming process used for that category.

The steps below are intended to identify possible funding sources, identify TSMO projects, prioritize the projects, and test the process through a pilot implementation. The full process described are for projects that would compete under a TSMO specific funding category, like ZVARIOUS. Some high priority projects may be selected to compete in other funding categories. Those projects would need to compete under those categories and be prioritized according to those categories' selection criteria.

Recommended Steps to Define a Programming Process for TSMO

IDENTIFY FUNDING SOURCES AND OPPORTUNITIES FOR TSMO TACTICS, SERVICES, AND ACTIVITIES.

- Continue to use ZVARIOUS sources of funds through the application of established prioritization criteria for needs as they arise
- Leverage the funding of larger capital projects by incorporating TSMO into larger construction projects
- Monitor eligibility criteria and timing (NOFO) of relevant federal grant opportunities and maintain access to staff resources to respond effectively

IDENTIFY TSMO PROJECTS TO BE CONSIDERED FOR PROGRAMMING

- Develop a process to identify a set of suggested TSMO projects
 - » Use TSMO implementation plan to identify projects
- Screen projects and select a set to feed the prioritization process that results in a set of TSMO projects for scoping

ESTABLISH A SET OF PRIORITIZATION CRITERIA FOR TSMO PROJECTS TO USE AVAILABLE FUNDING, PARTICULARLY FROM THE ZVARIOUS POOL

- Identify a set of suggestions for TSMO project prioritization methods and criteria from sources like peer agencies and those documented in the *Transportation Operations Manual*

SELECT A PILOT PROJECT (WITHIN THE TSMO ZVARIOUS POOL) TO DEMONSTRATE PRIORITIZATION

- TSMO program manager or stakeholder group selects the pilot.
- Apply the prioritization process.
- Revise the process based on the pilot experience.

Integrate TSMO into the Project Development Process

KYTC has implemented a range of TSMO strategies across the Commonwealth. However, there is not clear guidance on when or how TSMO strategies should be considered in a capital project. The TSMO Strategic Plan has the following objective: "Integrate potential TSMO strategies and actions into the development process for capital projects to make the most informed investments." However, it may not be clear to those involved in defining, scoping, and designing projects what TSMO strategies might be worth considering to meet the needs of any given project. It would be helpful if there were some guidance on when and how to incorporate TSMO strategies in capital projects, including examples of TSMO strategies that could meet various project needs. The guidance could include how TSMO strategies can support Performance Based Flexible Solutions.

The best way to make sure TSMO strategies are included in capital projects is to make sure they get considered in the scoping process. Scoping is the process of investigating a situation and developing a description of a project to address that situation. Including staff knowledgeable about TSMO strategies in the scoping process will help get TSMO considered.

The two steps in the action are to provide guidance on how to incorporate TSMO into capital projects and to include TSMO representation in the scoping process for all projects.

Recommended Steps to Integrate TSMO into the Project Development Process

PROVIDE GUIDANCE TO PROJECT DEVELOPMENT STAFF ON INCORPORATING TSMO INTO CAPITAL PROJECTS.

- Provide guidance on when/how design, traffic operations, maintenance, and bridge staff might look to TSMO strategies to meet project purpose and need, emphasizing that TSMO can also stand alone
- Include TSMO solutions in alternative development, especially performance-based flexible solutions considerations
- Consider foundational ITS infrastructure in all construction projects to gain cost and environmental efficiencies.
- Ensure maintenance considerations are included in the definition of the project so that appropriate resources can be identified and information be passed to the asset management system as appropriate
- Ensure that TSMO strategies are considered in the project description.

ESTABLISH TSMO REPRESENTATION IN THE SCOPING PROCESS FOR ALL PROJECTS

- The best way to establish TSMO representation will be dependent on scoping process recommendations being developed under a Kentucky Transportation Center (KTC) research project.

Determine a Set of TSMO Performance Metrics

Measuring the performance of the transportation network is an important activity to determine where improvements can be made and what types of improvements might enhance system performance. It is also important to measure performance to demonstrate accountability. In order to measure performance, a set of metrics need to be identified which should be developed from goals and objectives.

Planning, programming, and selecting elements of capital projects rely on an understanding of the benefits that can be derived. Benefits can be described in terms of performance metrics. A targeted set of performance metrics establishes the basis to estimate benefits. Performance metrics are critical to an effective programming process.

They can also provide the information needed to establish a business case for TSMO and can be used to report system performance.

The steps below outline a process to determine performance metrics.

Recommended Steps to Determine a Set of TSMO Performance Metrics

REVIEW PEER/INDUSTRY RECOMMENDED PRACTICES AND CONTEXT APPLICATIONS

- Review FHWA sources.
- Review peer agency practices.
 - » An example is the TxDOT Statewide TSMO Performance Measures.

IDENTIFY CANDIDATE PERFORMANCE METRICS FOR TSMO, LINKED TO DOH OPERATIONS PLAN GOALS AND TSMO STRATEGIC OBJECTIVES.

- Identify use of the metrics. For example, for TSMO project programming, a sample set could include:
 - » Collision rate
 - » Severity rate (K+A)
 - » Travel Time
 - » Travel Time Reliability
 - » Benefit-cost assessment
- Identify sources of data, including third party datasets, and resources needed to collect the data
- Identify staffing required to obtain, assemble and analyze the data.
- Consider data and performance metrics that currently exist in KYTC.
- Include consideration of ATSPM to support active traffic signal management and monitoring
- Include considerations for performance metrics' ability to support prioritizing/programming TSMO projects

SELECT/GAIN CONSENSUS ON METRICS

- Work with the TSMO Stakeholder group to gather input and attain consensus.

REFINE AND FINALIZE SET OF METRICS

- Revise/finalize the set of metrics based on stakeholder input.

DEVELOP PERFORMANCE REPORTS AND DASHBOARDS THAT COMMUNICATE PROGRESS AND ASSIST WITH DECISION MAKING ON 1) TSMO OBJECTIVE PROGRESS AND 2) TSMO TACTIC IMPLEMENTATION

- Develop the initial report format and outline based on TSMO Stakeholder group input.

- Develop a draft report.
- Provide the draft report to the stakeholder group for review.
- Finalize the performance report format and initial report.
- Based on the final report, develop a performance dashboard.
- Provide the dashboard to the stakeholder group for review and comment.
- Finalize the initial dashboard based on stakeholder comments.

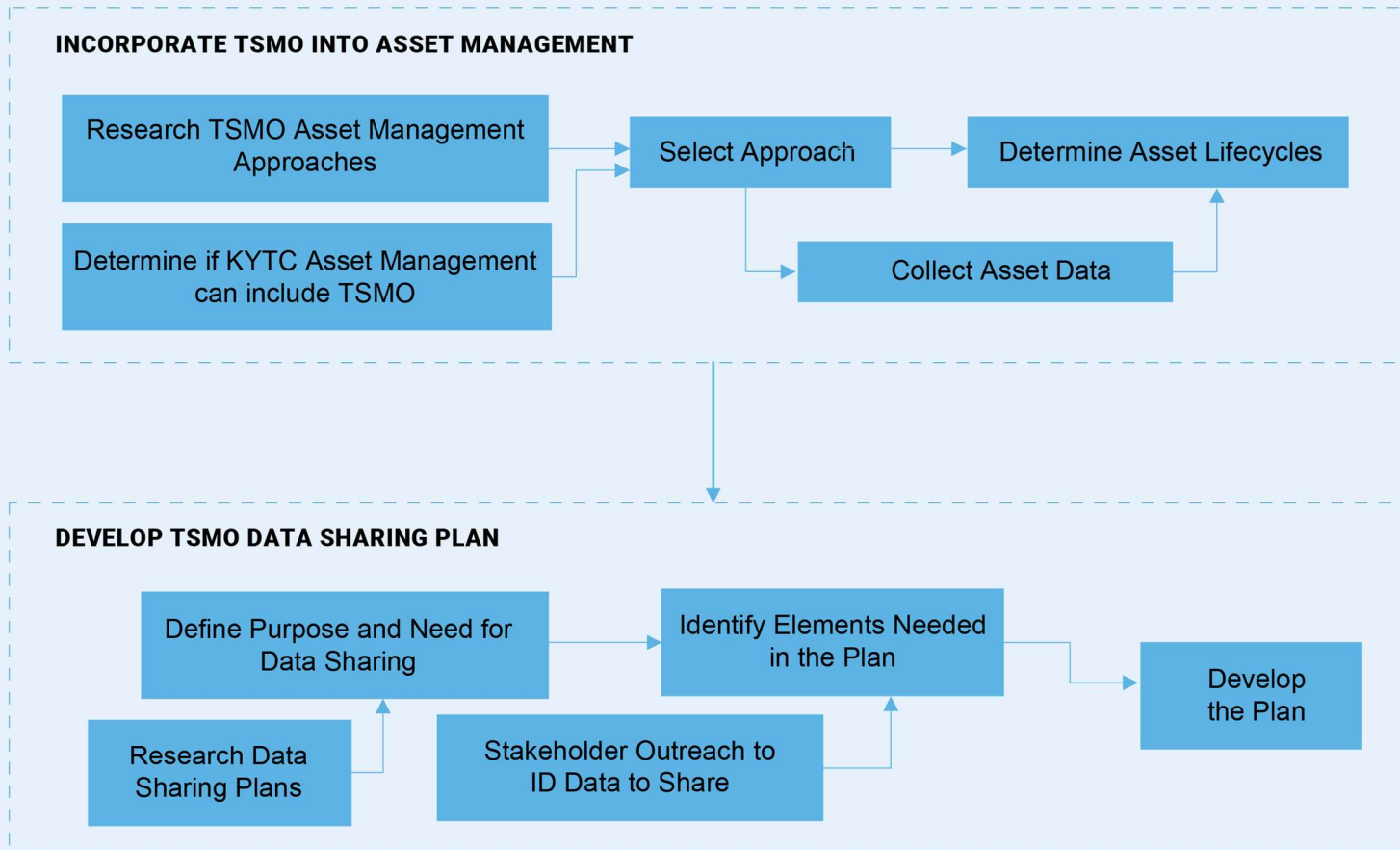
TSMO AND OTHER BUSINESS PROCESSES

Business processes are activities or set of activities that accomplish a specific agency goal. For example, project scoping is a business process that provides definition to a proposed project. The TSMO and Other Business Processes category includes actions aimed at two business processes: asset management and sharing data. The first action addresses incorporating TSMO into KYTC asset management activities. The second action develops a data sharing plan for TSMO data.

These two business processes were identified as being important to address during stakeholder workshops for this project. Neither have strong dependencies on other actions included in this plan. However, the data that will be included in the TSMO asset management process are important to consider in the data sharing plan.

Actions to improve core TSMO business processes are included in previous actions. These include establishing a TSMO program, developing a training program, and integrating TSMO into the planning process and the project development process.

Roadmap for KYTC TSMO Program - Other Business Process



Incorporate TSMO into KYTC Asset Management

TSMO strategies are generally based on system and field assets. It is important to manage TSMO assets to know when replacements might be needed, judge the performance of existing assets, and optimize TSMO strategies. The TSMO Strategic Plan includes the following objective: “Optimize ITS/TSMO asset investment through asset management principles and lifecycle planning.”

Transportation asset management (TAM) aims to preserve and manage infrastructure investment. It is intended to minimize the costs of preserving assets, maximize system performance, and support a data-driven decision-making process. The KYTC Transportation Asset Management Plan focuses on roads and bridges.² However, the same principles can be applied to TSMO assets. TSMO asset management should be compatible with KYTC asset management for roads and bridges.

The steps in this action build on effective approaches to TSMO asset management around the country and the KYTC TAM Plan.

(Because TSMO asset management is recommended to be implemented to be compatible with the KYTC TAM Plan and no actions in the other categories are dependent on TSMO asset management, this action does not need to be taken up immediately.)

Recommended Steps to Incorporate TSMO into KYTC Asset Management

RESEARCH APPROACHES TO MANAGE TSMO/ITS ASSETS

- Include reviewing the FHWA “Applying Transportation Asset Management to Intelligent Transportation Systems: A Primer” and the accompanying NOCoE webinar on incorporating TSMO into the asset management process.³

INVESTIGATE THE KYTC ASSET MANAGEMENT PROGRAM AND DETERMINE HOW TO MANAGE TSMO ASSETS IN A WAY THAT IS MOST COMPATIBLE WITH ASSET MANAGEMENT FOR ROADS AND BRIDGES

- Based on effective practices around the country and the KYTC TAM Plan, identify potential TSMO asset management approaches that will be most compatible.

SELECT APPROACH FOR MANAGING TSMO ASSETS

- Selecting an asset management system.
- Procure the selected system.

² See https://datamart.kytc.ky.gov/DM_docs/048_kentuckytc.pdf

³ See Primer at <https://ops.fhwa.dot.gov/publications/fhwahop20047/index.htm> and Webinar at <https://www.youtube.com/watch?v=o2xD1-W2RiY>

COLLECT NEEDED ASSET DATA DEFINE/DETERMINE TSMO ASSET LIFECYCLES

Develop TSMO Data Sharing Plan

The amount and types of data available to KYTC is growing rapidly. There is much more emphasis on data-driven decision-making. Other agencies generate data of use to KYTC, and other agencies are interested in accessing KYTC data. The amount and complexity of data can be daunting and managing data can be difficult if it is not organized. The TSMO Strategic Plan includes the following objective: "Manage data and data use to optimize TSMO strategies." It is important to develop a plan to articulate how data will be managed, shared, and used.

A data sharing plan will articulate the need for data sharing and identify what should be included in the data system. The steps below will define the purpose of the data sharing plan, identify the elements that should be included in the plan, and develop the plan.

Recommended Steps to Develop TSMO Data Sharing Plan

DEFINE PURPOSE AND NEED FOR THE DATA SHARING PLAN

- Determine what data will be covered by the plan.

RESEARCH DATA SHARING PLANS FROM OTHER AGENCIES

OUTREACH TO STAKEHOLDERS TO DETERMINE DATA TO BE SHARED AND WITH WHOM

- Assess available data.
- Conduct a gap assessment.
- Recommend the initial set of data to be shared among agencies.

IDENTIFY THE ELEMENTS THAT SHOULD BE INCLUDED IN THE PLAN

- Identify specific data to be shared based on the gap assessment.
 - » Identify whether each dataset is real-time or historical
- Recommend the types of analysis that would be supported by the data sharing system.
- Define Data Governance for the data sharing system. Include:
 - » Data quality
 - » Data and system security
 - Acceptable data use
- Security
 - » Data management
- Identify mechanisms to share the data. Possibilities include:
 - » Publish or stream the data.

- » Provide access and ability for users to query the data system.
- Determine the architecture for the data sharing system.

DEVELOP A DATA SHARING PLAN

- Incorporate the decisions made earlier in this action.

PRIORITY RECOMMENDED ACTIONS

The highest priority action steps from this business plan to pursue with consultant support are presented below.

- 1.** Training: Develop the TSMO 101 training course.
- 2.** Training: Develop the overall KYTC TSMO training curriculum.
- 3.** Integrate TSMO into the Planning Process: Provide assistance to MPOs to include TSMO in their planning processes.
- 4.** Planning support: Articulate the relationship between the TSMO program and the statewide ITS architecture.