

Coordination of IT and TSMO

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This factsheet, one of five in a series, focuses on staffing practices and highlights transportation agency coordination between Information Technology (IT) and Transportation Systems Management and Operations (TSMO). Each factsheet draws from Principles and Strategies for Effective Coordination of IT and TSMO, a Reference Document.

The role of IT is becoming increasingly central to TSMO. Leading edge TSMO strategies involve increasingly complex and interrelated systems, organizations, and institutions. Real-time and predictive tactics, such as active traffic management, integrated corridor management, and vehicle-to-infrastructure systems, are characterized by high levels of complexity and a dependence on integrating with IT.

The reference linked above identifies a range of IT-related challenges facing TSMO organizations and practices for addressing those challenges. One of the challenges discussed in the Reference Document relates to finding and developing TSMO support staff with the needed expertise in IT.





How Can TSMO Organizations Develop, Attract, and Retain Staff with IT Skills and Abilities?

TSMO functions that require IT expertise and skillsets unique to managing transportation technology present several unique staffing challenges. Agencies have used the following strategies to improve their TSMO and IT staffing capabilities.

Maryland Department of Transportation State Highway Administration (MDOT SHA) Establishes IT-Related Staffing Needs

TSMO initiatives require ongoing operations and IT staffing support. Many agencies, like MDOT SHA, have found that it is important to detail the IT resources required to develop, operate, and maintain TSMO IT functions and systems. The MDOT SHA identified new skills that would be needed to support its connected and automated vehicle strategic plan. A tool to identify ongoing IT and maintenance staff support needs is the System Engineering process, particularly the Concept of Operations. (https://ops.fhwa.dot.gov/int_its_deployment/sys_eng.htm).

Maricopa County Shares IT Staff with Regional Partnership

Within Maricopa County, Arizona, a partnership of public agencies across the entire Phoenix metropolitan area, called AZTech, developed a regional fiber network and data archival system. This was part of a Metropolitan Model Deployment Initiative to integrate ITS systems. To support the initiative, Maricopa County provided an IT specialist to directly support the development of center-to-center communication and the fiber network. After the initial fiber network was complete, the dedicated IT specialist remained embedded in the TSMO/ITS group, since that person understood the operations and functions better than anyone available in the enterprise IT groups. As efforts continued to build, the Arizona partnership determined that a Regional Archived Data System with dedicated staff specializing in TSMO data became a critical function.

Currently, through shared resources among the partner agencies, dedicated IT and data staff that support the AZTech mission remain and support the needs of coalition member TSMO/ITS operational staff.

Pennsylvania Turnpike Commission (PTC) Integrates IT Staff within TSMO Units

Many agencies have found that creating opportunities for IT staff to work within the TSMO structure on current activities can improve their understanding of the TSMO mission and TSMO end-user (e.g., managers and operations staff) data and software platforms needs. The PTC relies on its TSMO and IT staff to maintain system functionality and provide continuous customer service. To overcome their internal organizational silos, the PTC integrates IT staff into its operations business to enhance understanding and collaboration. The IT group was also included in efforts such as the TSMO Capability Maturity Model workshop and TSMO strategic planning. IT staff also accompany TSMO staff on field visits. These “ride-alongs” help IT staff understand how field devices are used and configured. The PTC believes that this interaction provides IT staff a better perspective on day-to-day operational needs and how IT may positively impact TSMO operations.

California Department of Transportation (Caltrans) Modifies Its Organizational Structure

Organizational structures can be used to provide cross-training mentorships between TSMO and IT groups. Agencies have used various options, including:

- Creating a relational link between the IT staff and the TSMO organization while keeping the IT resource within the IT structure.
- Transferring an IT position to the TSMO organization with oversight either remaining in IT or transferring to TSMO.
- Identifying coordinators or liaisons who have the responsibility to coordinate between the IT and TSMO groups.

Caltrans identified a TSMO staff person with IT understanding and expertise to act as a liaison between IT and the TSMO offices in the districts across the state. The liaison meets with IT as often as weekly to resolve IT-related issues when they surface.

Tennessee Department of Transportation (TDOT) Implements Coordination Policies

Creating internal policies and procedures that require mandatory coordination efforts can improve several processes (such as planning and scoping, project delivery, and security assessment and mitigation) that involve both IT and TSMO groups. In the case of TDOT, such efforts resulted in a set of actions and staff responsibilities to improve how TDOT procures services and ITS devices to improve ITS maintenance. Periodic meetings are held to continue to work through issues as they arise.

Florida Department of Transportation (FDOT) Provides Staff Training

It is often difficult for agencies to recruit employees with both the IT and transportation operations knowledge required in TSMO. To address this challenge, FDOT hires staff within their normal job classifications and then cross-trains them on the job to develop the necessary knowledge, skills, and abilities to carry out IT-related activities in a TSMO environment. As a result of the increased need to train staff, FDOT has documented many IT processes to standardize the understanding of the systems and processes and maintain institutional knowledge. (See the FDOT TSM&O Strategic Plan for more on workforce development and documented processes: https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/content/traffic/doc_library/pdf/2017-tsm-and-o-strat-plan-aug-24-2017-final.pdf?sfvrsn=d38c3054_0.)

Michigan Department of Transportation (MDOT) and New Hampshire Department of Transportation (NHDOT) Use External Organization Expertise

Leveraging external organization expertise may assist agencies in situations where specialized technical abilities and/or additional staff are needed. Some agencies believe that using expertise from outside of a transportation department provides flexibility for supporting a variety of areas, such as helping to define project assignment/delivery; supplementing in-house staff; or other as-needed, on-call tasks. For example, MDOT used its TSMO budget to fund positions in its centralized statewide IT department. These IT staff are dedicated to the transportation department and help with a variety of efforts, including identifying cybersecurity vulnerabilities. Similarly, NHDOT reached out to an external group, the National Guard, to help identify cybersecurity vulnerabilities in its ITS network.

The Reference Document and the other IT-TSMO factsheets are available at:

https://ops.fhwa.dot.gov/plan4ops/focus_areas/integrating/it.htm

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