Resources to Support Traffic Management Capability Maturity Framework Users

The Traffic Management (TM) Capability Maturity Framework (CMF) is intended for agencies or regions to assess current capabilities with respect to traffic management. The framework looks at the agency's ability to monitor, manage, and control traffic and the agency's ability to coordinate traffic information. Broadly, the framework assesses the capability to efficiently manage the movement of traffic on streets and highways, and includes corridor management approaches. The capability levels and the actions are focused and defined from a traffic manager's perspective. The actions may require other agencies to be the responsible party, which is intended to foster multi-agency collaboration and dialogue about traffic management at the regional level. The use of the framework is recommended for agencies considering Integrated Corridor Management (ICM) or Active Transportation and Demand Management (ATDM) applications or if there are changes being planned for existing Traffic Management Center (TMC) operations.

These resources provide users of Traffic Management CMF with relevant information as they consider their identified actions for improvement. When multiple examples are available, they are included as "additional examples" in the table.

Click below to go directly to a particular dimension:

- Business Process
- Systems and Technology
- Performance Measurement
- Organization and Workforce
- Culture
- Collaboration

For more general resources and publications pertaining to traffic management: FHWA Freeway Management Program Publications.

Business Process

Business processes, in the context of traffic management, refers to activities such as planning, programming, agency project development processes, and those organizational aspects that govern various technical or administrative functions such as training, human resource management, contracting and procurement, information technology, or coordination. In many cases, the business process elements go beyond the day-to-day operational activities and require broader institutional support and involvement to address. All of these processes are fundamental to the success of operations and management activities. Without the right procurement processes, partnering commitments, sustainable funding, internal awareness, and support, there could be a limited capacity to be able to implement more complex operations programs and activities. Table 1 provides a list of resources in this area.

Table 1. Business Process Resources for Traffic Management

Sub-Dimensions	Primary Example
Planning / Scoping Actions under this sub-dimension focus on the ability of an agency to scope and plan a performance-driven, objective-oriented traffic management program. Actions emphasize the ability to articulate operational objectives, regional traffic management concepts, performance, and regional roles and responsibilities for traffic management.	The Pennsylvania Department of Transportation (DOT)'s Transportation Systems Management and Operations (TSMO) Program Plan is a good example of plans that develop performance-driven traffic management strategies. **Additional Examples** • Michigan DOT TSMO Implementation and Strategic Plan • More examples of TSMO Program Plans are available in the primer developed by FHWA
Programming / Budgeting / Procurement Actions under this sub-dimension focus on the ability of an agency to program traffic management needs into the budgeting and procurement process emphasizing not just the capital expense but also the operations and maintenance costs. Actions emphasize approaches to manage existing and future traffic management assets while continually monitoring and maintaining the performance of these traffic management assets.	Ohio DOT's Traffic Operations Assessment System Tool (TOAST) provides a data-driven approach to programming TSMO projects.

Sub-Dimensions	Primary Example
Traffic Management Decision-Making Process Actions under this sub-dimensions focus on the decision-making approach used by agencies for traffic management. The intent of actions under this sub-dimension is to move agencies along a continuum toward more active management of their facilities. Actions specified in this area allow an agency to utilize more complex responses to mitigate both recurring and nonrecurring congestion.	Oregon Metro has developed a Mobility Corridors Atlas that provides a way to organize, integrate and understand land use and transportation data. Twenty-Four corridors in the region have a series of maps and charts showing land use and transportation network characteristics, system performance and future plans. The breadth of information is useful on a corridor-by-corridor basis as well as for comparisons between corridors. This atlas is useful for identifying strategies and investment priorities, and provides a framework for tracking change over time.

Systems and Technology

Use of the appropriate processes for design and implementation of systems will ensure that the needs of the region are appropriately addressed, that systems are implemented in an efficient manner, and that interoperability with other systems is achieved. Table 2 provides a list of resources in this area.

Table 2. Systems and Technology Resources for Traffic Management

Sub-Dimensions	Primary Example
Integration / Interoperability Actions under this sub-dimensions focus on the decision-making approach used by agencies for traffic management. The intent of actions under this sub-dimension is to move agencies along a continuum toward more active management of their facilities. Actions specified in this area allow an agency to utilize more complex responses to mitigate both recurring and nonrecurring congestion.	Florida DOT's SunGuide Software enables Florida TMCs to integrate numerous hardware, software, and network applications as well as exchange data with other TMCs. Because SunGuide standardizes common TMC functions, it helps the various Florida DOT District facilities become more interoperable so their systems operate better together.
Regional Architectures Actions under this sub-dimension help an agency plan its projects and technology insertions with consideration of regional interoperability, collaboration, and data sharing. Actions identified here help agencies consider the implications of their particular projects on their broader region and support robust insertion of technology into the planning process.	California Department of Transportation (Caltrans) has a Statewide ITS Architecture (SWITSA) that provides a framework for existing and planned ITS deployment in California. In particular, the "System Builder" is a useful web-based tool to enable project-level use of the architecture. **Additional Examples** • Applying a Regional ITS Architecture to Support Planning for Operations - A Primer • FHWA Regional ITS Architecture Guidance Document

Sub-Dimensions	Primary Example
Project Systems Engineering / Testing and Validation Actions under this sub-dimensions focus on the ability of agencies to implement systems and technology projects that successfully minimize cost and schedule risk while achieving desired system functionality. Actions emphasize the role of systems engineering principles in traffic management projects	The Minnesota Department of Transportation developed and maintains a series of documents that are part of the Systems Engineering for Standard ITS Applications includes Concept of Operations (ConOps), Functional Requirements (FRs), and ITS Checklists for standard ITS applications. **Additional Example** • ITS Implementation – Project Classification and Systems Engineering Requirements Decision Tree

Performance Measurement

Performance measurement is essential as the means of determining program effectiveness, determining how changes are affecting performance, and guiding decision-making. In addition, operations performance measures demonstrate the extent of transportation problems and can be used to make the case for operations within an agency and for decision-makers and the traveling public, as well as to demonstrate to them what is being accomplished with public funds on the transportation system. Table 3 provides a list of resources in this area.

Table 3. Performance Measurement Resources for Traffic Management

Sub-Dimensions	Primary Example
Measures Definition Actions under this sub-dimension help an agency identify the most important measures for traffic management in the region and define them formally, including identifying where they will be measured for the program. As capability matures, actions provide agencies with the ability to incorporate more outcome-oriented measures in their performance framework.	Missouri DOT's Tracker is a tool to assess how well the Department delivers services and products to its customers. The document is organized into seven major performance goals. Additionally, Section 5 focus on performance measures specifically around St. Louis, Kansas City, Springfield and Columbia, including estimating the cost and impact of traffic congestion. This report provides an example of what measures are being used to assess performance in different cities. **Additional Example** • Virginia DOT Dashboard Performance Reporting System for Projects and Programs
Data Acquisition Actions under this sub-dimension help an agency establish a data acquisition approach to the defined performance measures, including defining data gaps, establishing data management systems, and identifying public- and private-sector roles and opportunities.	The Caltrans Performance Measurement System is an online visualization of that displays traffic data on a map that is collected in real-time from over 39,000 individual detectors. These sensors span the freeway system across all major metropolitan areas of the State of California. It is also an Archived Data User Service (ADUS) that provides over ten years of data for historical analysis. It integrates a wide variety of information from Caltrans and other local agency systems.

Sub-Dimensions	Primary Example
Performance Management Actions under this sub-dimension help an agency use the performance measures to actively manage their traffic management program. Actions emphasize the continuous monitoring of projects and the ability of an agency to change, adapt, and prioritize traffic management responses, decisions, and investments based on the observed measures.	TRANSCOM's SPATEL (Selected Priorities Applied To Evaluated Links) [download the *Introduction to SPATEL-DFE* pdf from the link] system provides web-based data analysis tool needs of the 18 member agencies to allow analysis of transportation system performance (e.g., travel time and volume).

Organization and Workforce

Efficient execution of processes supporting effective programs requires appropriate combination of coordinated organizational functions and technical qualified staff with clear management authority and accountability. Table 4 provides a list of resources in this area.

Table 4. Organization and Workforce Resources for Traffic Management

Sub-Dimensions	Primary Example
Organizational Structure Actions under this sub-dimension help an agency create an organizational structure for traffic management that is effective. While there is no single recommended organizational structure, the actions emphasize clear identification of roles, responsibilities, leadership, and procedures necessary for the sustained growth of the program.	New Jersey DOT has a comprehensive Transportation Systems Management Manual, which includes detailed guidance for New Jersey DOT to navigate the organizational and governmental structure of Transportation Systems Management and of the Department. It also includes detail relating to the processes, tools, databases, and procedures that relate to the back-end management of the Department's ITS program but do not control the ITS system directly.
Recruitment and Retention Actions under this sub-dimension help an agency recruit and retain a workforce that is capable of meeting all the traffic management objectives. Actions emphasize cross-training and redundancy of capabilities in the workforce to minimize single points of failures in traffic management operations.	Washington DOT prepared a recent Recruitment and Retention Study to consider issues affecting program oversight and delivery including compensation issues that may hinder the recruitment and retention of a quality core workforce for engineering and technical employees in the preliminary engineering segment of the workforce.
Staff Development / Professional Capacity Building Actions under this sub-dimension help an agency continually improve its staff capabilities and provide a formal approach to incorporating new staff into the traffic management operations. Actions emphasize in-house and external training needs to not only support current needs but also put the agency on sound footing for future traffic management opportunities.	Niagara International Transportation Technology Coalition (NITTEC), an operating coalition in the Buffalo area, offers specialized training for common regional needs around transportation and safety. Much of the training in in situ and formal training is identified as a priority in the Strategic Plan.

Culture

Culture is the combination of values, assumptions, knowledge, and expectations of the agency in the context of its institutional and operating context, and as expressed in its accepted mission and related activities. Table 5 provides a list of resources in this area.

Table 5. Culture Resources for Traffic Management

Sub-Dimensions	Primary Example
Understanding / Leadership / Champions Actions under this sub-dimension provide an agency with ideas to increase the visibility of traffic management within their agency and identify champions who understand the impacts and the role that traffic management programs play in the broader agency's priorities. Actions here emphasize the internal communication of the successes, challenges, and needs to appropriate decision-makers to gather support at all levels of the organization.	The Delaware Valley Regional Planning Commission (DVRPC) has a Transportation Management Task Force composed of technical staff representatives from over 35 regional stakeholders and is the focal point of regional ITS coordination. The Task Force is a forum for agencies to share information on ITS deployments and incident management programs, develop a consensus on regional ITS issues and respond to federal initiatives. It has the ability to establish subcommittees to tackle specific issues as they arise. As a technical-level group, it directs DVRPC's Transportation Operations planning activities that in turn support the Task Force.
Program Status / Authorities Actions under this sub-dimension focus on increasing the ability of traffic managers to take risks and innovate. Broadly, actions here aim to increase an agency's profile for traffic management locally, statewide, and nationally, emphasizing the delegation of authority to traffic managers to try to implement pilots and strategies that haven't been attempted in the agency.	Established in 1993, Houston TranStar manages the region's transportation system and is the primary coordination site for state, county and local agencies when responding to incidents and emergencies. Houston TranStar is a unique partnership of representatives from the City of Houston, Harris County, METRO and Texas DOT who share resources and exchange information under one roof to keep motorists informed, roadways clear and lives safe in the fourth most populated city in the United States.

Sub-Dimensions	Primary Example
Outreach Actions under this sub-dimension focus on conducting a sustained and focused outreach to external stakeholders for traffic management. Actions include the ability to report on performance, identify stakeholder needs, and develop a communications plan.	NITTEC has a formal Customer Engagement Plan (described within the [Strategic Plan](#)) that is designed to help meet the transportation needs of people in the region, NITTEC makes several types of information available. Some is disseminated in real-time, some do not change and remain available on an ongoing basis.

Collaboration

The development and implementation of traffic management requires a collaborative approach. The effectiveness of most strategies is dependent on improving the coordinated performance of each partner. Table 6 provides a list of resources in this area.

Table 6. Business Process Resources for Traffic Management

Sub-Dimensions	Primary Example
Operational Agency Collaboration Actions under this sub-dimension focus on the relationships between the different operating agencies in the region, emphasizing the evolution from relationships based on personal connections to ones that are more formalized and well formed. Actions here help agencies develop more effective partnerships for day-to-day operations regionally.	TRANSCOM is a coalition of 16 transportation and public safety agencies in the New York - New Jersey - Connecticut metropolitan region. It was created in 1986 to provide a cooperative, coordinated approach to regional transportation management. This is a free service that allows various user groups (i.e. the general public, commercial vendors, transportation agencies, researchers, media and others) to access TRANSCOM real-time event and link (travel time) data for use in their applications. The data feed contains 'real-time' event information provided by member agencies of TRANSCOM.
Local Government / MPO / RPTA Cooperation Actions under this sub-dimension focus on the relationships between the traffic management agency and the planning bodies in the region. Actions included emphasize the evolution from ad hoc inclusion of traffic management to a performance-based, objective-driven approach. Actions here help agencies develop more effective partnerships for planning traffic management regionally.	Colorado DOT partners with county agencies and stakeholders to convene County-Wide Coordination Meetings. Participants of these meetings include county, city, and town representatives who will meet on an agreed-upon schedule in order to discuss upcoming projects, ongoing projects, and maintenance activities. Federal and state agencies and special interest groups may also be involved in these meetings.
Private-Sector Participation Actions under this sub-dimension help an agency consider the best role for the private sector in traffic management. While a particular level or nature of private-sector participation is not specified, actions identified help agencies understand the needs and the potential of the private sector in their traffic management program.	Georgia DOT has a commitment to P3 Project delivery and has integrated the private sector into numerous projects. Additionally, some of the information provided on the NaviGator traveler information website is provided via WAZE.

Sub-Dimensions	Primary Example
Data Sharing Actions under this sub-dimension focus on the relationships between the different operating agencies in the region, emphasizing the evolution from relationships based on personal connections to ones that are more formalized and well formed. Actions here help agencies develop more effective partnerships for day-to-day operations regionally.	TRANSCOM Data Fusion Engine provides a data sharing mechanism between the 16 participating members in the TRANSCOM's coalition
Research / Applied Research Actions under this sub-dimension strengthen agency linkage to research into new and emerging areas of traffic management. The emphasis of actions here is on enabling an agency to support and continually improve the state of the art in traffic management by leveraging available research facilities and capabilities.	Minnesota DOT has a longstanding research program that serves as a resource for Minnesota DOT staff as well as city and county engineers, kick-starting research and shepherding projects to completion. At any given time, our staff manages approximately 190 research projects in progress, ranging from local initiatives to pooled-fund projects with other states, comprising both basic and applied research.
Interaction with Public Actions under this sub-dimension help an agency establish a mutually beneficial relationship with the traveling public. Actions identified here strive to move agencies from one-way information dissemination to two-way information sharing with the public using traditional and nontraditional approaches.	North Carolina DOT has a Public Engagement Toolkit that provides practical information for project managers looking for ways to better engage the public as part of a plan, project or study process.