

# Business Process Guidance

✓ LEVEL 1 TO LEVEL 2

## Why Business Processes are Important

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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 interoperability with other systems is achieved.

## Improvement Target

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| From | Processes related to TSM&O activities ad hoc and un-integrated (L1)                   |
| To   | Multiyear statewide TSM&O plan and program exists (L2)                                |
| By   | Establishing framework for suitable TSM&O related planning and programming activities |

## Key Sub-dimensions

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- [Planning Process](#)
- [Programming/Budgeting](#)
- [Project Development/Procurement](#)

## Planning Process Action Plan (L1 to L2)

### Strategy Summary

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Based on existing state of play, identify key priorities and develop initial state DOT district/regional plan(s) for TSM&O infrastructure and real-time operations

### Key Actions

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- A** Review current agency mission, vision and goals with respect to TSM&O, including implied strategies and outcomes related to specific stakeholders

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- B** Review current state of play within the agency regarding TSM&O deployment and relationships with key players regarding the planning and development processes – district, regional and statewide

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- C** Identify agency operations objectives and related priorities for immediate action/next step implementation of standard TSM&O strategies in key urban and rural regions/districts and develop/update state DOT district/regional plans(s)

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- D** Develop operational concepts and systems architecture for start-up strategies or next steps

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- E** Encourage and participate in incorporation of TSM&O within the ongoing cooperative regional planning process within MPO/RTPA planning to coordinate state proposed actions with local government and related regional activities

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- F** Identify internal and external processes or process changes needed to implement operational concepts

### ACTIONS

Action A: Review current agency mission, vision and goals with respect to TSM&O, including implied strategies and outcomes related to specific stakeholders

Rationale: Agency program should reflect stated mission, vision and goals (MVG) in terms of strategies and level of emphasis and appropriate investment.

**A.1** Review MVG for focus on customer level of service both in terms of mobility and safety (passenger and freight) programs included in formal agency documents, including management of congestion, reduction of delay and improvement of reliability—especially in relationship to non-recurring congestion.

**A.2** Identify the degree to which current agency programs incorporating conventional strategies and performance targets associated with reducing delay include non-recurring congestion, and identify missing opportunities or the need to revise policy.

**A.3** Develop discussion among key agency leadership, planning and TSM&O-related staff regarding appropriate range of strategies and program implications to meet or modify current MVG.

**A.4** Conduct parallel discussions with regional planning entities and local governments.

Responsibility and Relationships: Working group combining central office operations and planning staff and key district/regional staff together with public safety, MPO and local government staff as appropriate.

Action B: Review current state of play within the agency regarding TSM&O deployment and relationships with key players regarding the planning and development processes – district, regional and statewide

Rationale: The next steps in improved TSM&O strategy implementation/improvement should build on existing processes and project activity as point of departure.

**B.1** Identify staff at central office and relevant districts/regions to work together to evaluate the existing state of play regarding TSM&O strategies deployed and ongoing formal planning and development processes, including whether and how TSM&O is involved in current regional planning, congestion management planning and corridor planning. Include a status review covering DOT statewide planning, rural (RTPA) and urban (MPO) planning.

**B.2** Identify any ongoing TSM&O activities that may serve as persuasive points of departure or models for next steps, including utilization of traffic management center data as may be available. Develop discussion of impact of cost and capacity constraints, mobility, safety and livability cost-effectiveness.

**B.3** Working in collaboration with regional partners in service delivery, determine current/needed responsibilities for planning among agency operations and planning staff and establish working relationships with MPOs and emergency managers – including establishment of regional group (committee, task force) for TSM&O planning, agency representation, and identification of decision-making regarding projects and resource allocation. Develop a work program for plan development.

Responsibility and Relationships: Working group combining central office operations and planning staff and key district/regional staff together with MPO and local government staff as appropriate.

Action C: Identify agency operations objectives and related priorities for immediate action/next step implementation of standard TSM&O strategies in key urban and rural regions/districts and develop/update state DOT district/regional plans(s)

Rationale: Recognizing the timeline that may be required for development of a formal district/regional TSM&O planning process, consider state DOT initiative to implement high priority strategies where need/justification is apparent and independent agency actions are feasible.

**C.1** Identify objectives as apparent in agency policy documents and/or widely accepted (see Performance Measurement Guidance: Measures Utilization Plan L1 to L2).

**C.2** Identify the most visible and urgent priorities and objectives for short-term and unique potential of TSM&O strategies based on agency policy initiative, recent or ongoing emergency response, weather, major incidents or special event challenges – focused on upgrading existing technology and expanding coverage.

**C.3** Identify the relationships between agency policy objectives and the current improvement activities with respect to the potential of improved TSM&O to meet objectives, with special focus on congestion-reduction, reliability improvement, and safety.

**C.4** Gain policy and managerial support for development of agency approach to improved TSM&O including senior activity sponsor, both for immediate event-related response and for longer term strategic development.

**C.5** Review existing state of play regarding relationships between known operations-related problems and current TSM&O activities at the level of agency districts/regions and statewide (urban and rural) in areas where the agency may proceed independently.

**C.6** Identify districts/regions and locations with most compelling problems suitable for start-up or improved TSM&O actions. This may result from obvious problems (where study is not needed), upgrades of existing strategy applications, or improvements in technology. Consideration may also be given to a critical corridor approach, interregional or statewide.

**C.7** Review peer experience regarding the relevance of TSM&O strategies and their logical staging and key implementation issues.

**C.8** Identify highest payoff TSM&O strategies (recognizing resource constraints) to respond to obvious major recurring and non-recurring congestion (urban and rural) on an immediate action basis where they can be implemented without the need for formal planning among jurisdictions (i.e. incorporation into planned construction or maintenance projects or standalone TSM&O strategies with minimal interjurisdictional dependency or in rural areas where multijurisdictional coordination is less essential). Initiate consultation and integration into the formal planning process (as per C.10 below).

**C.9** Develop high level statewide ITS/TSM&O policy framework for immediate action related to DOT priorities in each region or all regions, reflecting statewide policy standards on responding to key recurring and non-recurring congestion as addressed by TSM&O conventions and considering capabilities and resources, including DOT regional/district plan. Develop consistent district/regional level plans as appropriate and consider approach to replicating successful approaches from one district/region to others.

**C.10** Take the lead in assembling a working group of relevant implementation partners (including public safety agencies) at the regional level for key strategy applications related to state responsibility areas to coordinate immediate action strategy implementation at the district/regional level as appropriate to the agency's immediate actions (such as incident management) and coordinate early action planning with related ongoing activities and requirements such as Department of Homeland Security National Incident Management System planning.

**C.11** Develop implementation plan for selected immediate next step(s) and phases related to annual budgeting and state transportation improvement program (STIP) development including upgrades to existing ITS infrastructure or expansion of coverage and continued maintenance (focused on surveillance, detection, and interagency communications), initial consensus goals and objectives, operations concepts and protocols, as well as appropriate performance measures and related data (see the Performance Measurement Dimension).

Responsibility and Relationships: Working group combining central office operations and planning staff and key district/regional staff together with public safety, MPO and local government staff as appropriate.

Action D: Develop operational concepts and systems architecture for start-up strategies or next steps

Rationale: Effective strategies must link planning with actual operations through clear understanding regarding operations objectives, roles and responsibilities of participants, data and communication requirements, and real-time protocols.

**D.1** Develop Regional Concept of Operations involving all key participants in planning and service delivery and include consideration of performance measures, ITS infrastructure, relationships and procedural agreements, and resource arrangements.

**D.2** Develop and document regional architectures as appropriate supporting existing and proposed TSM&O strategy implementation including conventional systems operations and management strategies, emergency management and emerging Connected Vehicle services.

**D.3** Review implications for ITS infrastructure deployment on a strategic basis to support multiple strategies and to extend network coverage over time.

Responsibility and Relationships: Working group combining central office operations and planning staff and key district/regional operations, traffic management center and maintenance staff together with public safety and local government staff as appropriate.

Action E: Encourage and participate in incorporation of TSM&O within the ongoing cooperative MPO/RTPA regional planning process to coordinate state proposed actions with local government and related regional activities

Rationale: To become most effective at the regional level, TSM&O must be incorporated into the formal regional planning and programming process.

**E.1** Establish agency policy about participation in regional agencies' ongoing planning and programming process in terms of representation on policy and technical committees, and activities to represent TSM&O interests of agency.

**E.2** Establish policy regarding agency involvement in regional planning and ways to support further inclusion of TSM&O improvements within MPO/RTPA regional multimodal transportation planning and programming processes including designation of agency representation and objectives. An existing Congestion Management Plan may provide a useful point of departure.

**E.3** Working with MPO/RTPA, identify the relationships between regional policy objectives and the current improvement activities in relationship to the potential of improved TSM&O to meet objectives with special focus on congestion-reduction, reliability improvement and safety. Where appropriate, develop persuasive presentation, based on national and peer experience regarding the relevance of TSM&O strategies for use with partners in the regional planning context.

**E.4** Working with regional partners, establish and discuss among key service delivery partner technical staff the current best practice of peers regarding TSM&O strategies as relevant to context (urban and rural), including implications of operational concepts, infrastructure, roles, and procedures. Include consideration of federal planning and architecture requirements and performance reporting.

**E.5** Working with regional partners and MPO/RTPA staff, determine type of regional planning needed, compared to available resources and data and consistent with federal requirements and best practices (planning, forecasting, analysis, and evaluation). Identify start-up/next steps with methods suitable to TSM&O strategies' short-term, network-wide characteristics, and assign responsibility. Identify collaboration mechanisms and assemble resources.

**E.6** Working with regional partners, identify the key recurring and non-recurring relevant regional problems to be addressed by regional TSM&O programs as related to key transportation objective, including mobility, safety, and livability, and relevant performance measures (both output and outcome).

**E.7** Work with regional partners to identify scope and structure to develop standalone plan or comprehensive metropolitan or rural regional plan element. Include consideration of appropriate level of detail in policy statement, deficiency analysis, future problem forecast, alternatives evaluation, and improvement programming. Develop plan product with appropriate staging and relationships to responsibilities of jurisdictions and resource availability.

Responsibility and Relationships: Central office and district planning and operations staff taking initiative with MPO/RTPA staff through appropriate regional planning task force. Senior district/regional executive support may be essential to establish framework.

Action F: Identify internal and external processes or process changes needed to implement operational concepts

Rationale: Existing communications, information transfer and field roles and procedures may require adjustments to bring into conformance with operational concepts.

**F.1** Develop working group to review operational concepts for both existing and proposed TSM&O strategy applications with objective outcome of improved efficiency and effectiveness.

**F.2** Compare operations concepts at best practice level with current roles, relationships and field procedures regarding communications and actions, and identify inconsistencies and barriers to improving effective performance and achieving the operations objective.

**F.3** Develop and execute changes appropriate for consistency with operational concept and improved efficiency and effectiveness.

Responsibility and Relationships: Working group combining central office operations and planning staff and key district/regional operations, traffic management center and maintenance staff—bringing in public safety and local government staff as appropriate. Senior district/regional executive support may be essential to establish framework.

## Examples/References:

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- Primer: Statewide Opportunities For Linking Planning and Operations (FHWA): [http://www.ops.fhwa.dot.gov/publications/fhwahop08028/state\\_plnops.pdf](http://www.ops.fhwa.dot.gov/publications/fhwahop08028/state_plnops.pdf)  
Primer designed to raise awareness of the benefits and opportunities for coordinating planning and operations.
- Advancing Metropolitan Planning for Operations: The Building Blocks of a Model Transportation Plan Incorporating Operations – A Desk Reference (FHWA, April 2010): <http://www.ops.fhwa.dot.gov/publications/fhwahop10027/fhwahop10027.pdf>

Resource designed to enable transportation planners and their planning partners to build a systematic transportation plan.

- Congestion Management Process Guidebook (FHWA): [http://www.fhwa.dot.gov/planning/congestion\\_management\\_process/cmp\\_guidebook/](http://www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/)
- Florida Department of Transportation ITS Plan: [http://www.dot.state.fl.us/trafficoperations/its/Projects\\_Deploy/Strategic\\_Plan/050512-FinIRprt\\_V1-2.pdf](http://www.dot.state.fl.us/trafficoperations/its/Projects_Deploy/Strategic_Plan/050512-FinIRprt_V1-2.pdf)
- Nevada Department of Transportation Best Practices Reference Guide: [http://www.kimley-horn.com/projects/NevadaITRP/images/pdfs/TechMem\\_three.pdf](http://www.kimley-horn.com/projects/NevadaITRP/images/pdfs/TechMem_three.pdf)
- Guide to Integrating Business Processes to Improve Travel Time Reliability (SHRP 2 L01): <http://www.trb.org/Publications/Blurbs/165284.aspx>
- Incorporating Reliability Performance Measures into the Transportation Planning and Programming Processes (SHRP 2 L05): <http://www.trb.org/Main/Blurbs/168854.aspx>
- Evaluating Alternative Operations Strategies to Improve Travel Time Reliability (SHRP 2 L11): <http://www.trb.org/Main/Blurbs/168142.aspx>
- Maricopa County Association of Governments ITS Concept of Operations: [http://www.azmag.gov/Documents/pdf/cms.resource/RCTO-Final\\_Report79101.pdf](http://www.azmag.gov/Documents/pdf/cms.resource/RCTO-Final_Report79101.pdf)
- Maricopa County Association of Governments ITS Strategic Plan: <http://www.azmag.gov/Projects/Project.asp?CMSID=1050&CMSID2=4231>

## Programming/Budgeting Action Plan (L1 to L2)

### Strategy Summary

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Identify initial resource needs for logical TSM&O strategies “next steps” for key districts

### Key Actions

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- A Develop order of magnitude cost estimates – capital, operating and maintenance
- B Develop agency district/regional-level program and budget based on initial district plans
- C Determine short term district/regional-level funding strategy (capital, maintenance and staffing) by budget categories and timeframes
- D Develop cooperative approach to MPO/RTPA programming and budgeting

### ACTIONS

Action A: Develop order of magnitude cost estimates – capital, operating and maintenance

Rationale: For budgeting and programming purposes, a set of preliminary cost estimates for proposed improvements is essential, including all key resource categories projected forward.

**A.1** Develop unit cost estimates for key plan elements broken down into discrete elements and stages. Elements to be included are communications, field devices, equipment, software and systems integration, systems upgrades, structures, staffing (in terms of fulltime equivalents), and maintenance.

**A.2** Determine costs for at least a budget cycle (5-6 years). Logical increments of program should be developed that deliver discrete benefits and which are logical increments to proceeding phases (or existing systems).

**A.3** Consideration should be given to acquisition strategies such as turnkey, leasing, and outsourcing, as these may impact costs.

Responsibility and Relationships: Working group combining central office operations, planning and project development staff and key district/regional operations, traffic management center and maintenance staff.

Action B: Develop agency district/regional-level program and budget based on initial district plans

Rationale: Moving beyond one-time opportunistic funding of a given stage for TSM&O strategy deployment requires an understanding of the resource implications.

**B.1** Building on initial district plan, develop implementation approach for selected immediate next step(s) and subsequent phases related to ITS infrastructure deployment needs (focused on surveillance, detection, and interagency communications), initial consensus goals and objectives, and operations concepts and protocols, as well as appropriate performance measures and related data (see Performance Measurement Dimension).

**B.2** Determine order of magnitude multi-year capital investment for infrastructure and staged upgrades, as well as staffing requirements and annual maintenance costs.

Responsibility and Relationships: Working group combining central office operations, planning and budgeting staff and key district/regional operations, traffic management center and maintenance staff.

Action C: Determine short term district/regional-level funding strategy (capital, maintenance and staffing) by budget categories and timeframes

Rationale: TSM&O improvements will be constrained both by overall budgets at the district/regional and statewide level, but also by the budget categories and conventional uses

**C.1** Identify the current and/or most likely sources for funding capital, staffing, and maintenance requirements, both in the short-run (based on current budgeting and programming processes) and as may be appropriate in the long-run – given the potential of TSM&O.

**C.2** Prepare program proposal and match program components to likely available sources.

Responsibility and Relationships: Working group combining central office operations, planning and budgeting staff.

## Action D: Develop cooperative approach to MPO/RTPA programming and budgeting

Rationale: Funding for metropolitan and rural regions utilizing both federal and individual jurisdiction funds requires the development of a collaborative approach to budgeting.

**D.1** Based on plan development identify consensus regional priorities with realistic funding potential.

**D.2** Work with MPO/RTPA to develop joint funding schedule and program commitments.

**D.3** Initiate dialogue with participants in planning process regarding relative costs and benefits of TSM&O program and use of performance measures.

Responsibility and Relationships: Develop cooperative joint working group with MPO/RTPA led by central office statewide operations leader.

### Examples/References

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- Transportation Management Center Business Planning and Plans Handbook:  
[http://tmcops.fhwa.dot.gov/cfprojects/uploaded\\_files/TMC\\_BPG\\_Final.pdf](http://tmcops.fhwa.dot.gov/cfprojects/uploaded_files/TMC_BPG_Final.pdf)
- Strategic Planning and Decision Making in State Departments of Transportation:  
[http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_syn\\_326.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_326.pdf)
- Maryland State Highway Administration Coordinated Highways Action Response Team (CHART) Non-constrained Deployment Plan (2005):  
<http://www.chart.state.md.us/downloads/readingroom/CHART-NCDP-2005-Final-Plan.pdf>

## Project Development/Procurement Action Plan (L1 to L2)

### Strategy Summary

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Analyze special needs and requirements for efficient TSM&O project development

### Key Actions

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- A Coordinate implementation of TSM&O-related infrastructure into other ongoing highway development activities
- B Develop appropriate TSM&O project development process by project type and components
- C Consider “make or buy” options for development of infrastructure and services
- D Develop appropriate TSM&O project procurement strategies
- E Review agency procurement process options for appropriate modifications to accommodate ITS infrastructure

### ACTIONS

Action A: Coordinate implementation of TSM&O-related infrastructure into other ongoing highway development activities

Rationale: Even where TSM&O-related projects and their ITS infrastructure and other project components are not part of the formal project development process they can be added into on-going highway improvement projects.

**A.1** Compare type and location of proposed TSM&O-related infrastructure improvements (communication, surveillance and detection, dynamic message signs, ramp metering, etc.) with ongoing highway improvement projects (such as major reconstruction or new lanes) and identify opportunities for “piggybacking” ITS infrastructure into the project design and development process, including provision of conduit, device structures, and geometric modifications.

**A.2** Work with highway project development manager to integrate TSM&O-related features into ongoing project development process.

Responsibility and Relationships: Central office statewide and district operations staff working with highway development project managers.

Action B: Develop appropriate TSM&O project development process by project type and components

Rationale: Various ITS/TSM&O projects have different characteristics that impact steps in the standard project development process.

**B.1** Identify project characteristics that may suggest variations in the agency standard project development processes including project type, staffing and management, data acquisition, scope, systems engineering, software, systems integration, mix of capital and operations costs, investments in procedures development and training, acceptance testing, acquisition of private services, etc.

**B.2** Identify other special requirements of TSM&O (legal and technical) that differentiate them from current formal processes for capital projects (systems engineering, integration). Identify conventional steps in the project development process that may be inappropriate given project characteristics (e.g. absence of environmental impact or small project size).

**B.3** Identify lead time issues (if any) such as right-of-way acquisition, permitting, and environmental clearance.

**B.4** Identify the applicability of agency standard project development processes (including any special "minimal" project development processes for low cost, low impact projects) and develop modifications as appropriate.

**B.5** Apply appropriate process for initial projects.

Responsibility and Relationships: Central office statewide operations staff working with project development and procurement staff.

Action C: Consider "make or buy" options for development of infrastructure and services

Rationale: It may be cost effective in terms of capital, staffing and maintenance costs, as well as technology risk, to outsource the development of certain capabilities.

**C.1** Review existing projects and their probable continuing evolution and consider pros and cons of outsourcing vs. agency staff provision, taking into account time to implement, staffing requirements, technology flexibility, agency control and risk factors.

**C.2** Review range of experience with peer agencies, with special attention to performance management of outsourcing contracts.

**C.3** Develop strategy for technology and services acquisition with appropriate balance of in-house vs. outsourced elements.

Responsibility and Relationships: Central office statewide operations staff working with project development and procurement staff.

Action D: Develop appropriate TSM&O project procurement strategies

Rationale: Various ITS/TSM&O projects have different characteristics for which certain procurement approaches are appropriate to support minimal costs and limit risk.

**D.1** Review existing literature and peer state experience for project development and procurement experience and guidelines. Match project type with optimum procurement including consideration of type of work, mix of hardware and software, complexity, method of award to contractor, contract form and type.

**D.2** Review range of procurement options including commodity supply, low bid, design/construct, systems manager, consultant, and outsourcing and their impact of quality and costs assurance and risks.

Responsibility and Relationships: Central office statewide operations staff working with project development and procurement staff.

Action E: Review agency procurement process options for appropriate modifications to accommodate ITS infrastructure

Rationale: Standard procurement options may or may not be appropriate for optimum control of quality and costs, and therefore modifications to existing procurement may be necessary.

**E.1** Address issue with agency procurement staff to develop approach appropriate to procurement strategies as a function of system size, complexity, and type.

**E.2** Develop appropriate approach and instruments for initial projects.

Responsibility and Relationships: Central office statewide operations staff working with project development and procurement staff.

### Examples/References:

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- Guide to Contracting ITS: [http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_560.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_560.pdf)
- Managing High Technology Projects in Transportation (offered by the Consortium for ITS Training and Education. To Access This Resource: <http://www.citeconsortium.org/courses/2mod11.html>
- Best Practices In Project Delivery Management: [http://onlinepubs.trb.org/onlinepubs/nchrp/docs/nchrp20-68A\\_07-01.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/docs/nchrp20-68A_07-01.pdf)
- Project Management - Delivering the Capital Construction Programs at the Project Level: <http://www.wsdot.wa.gov/projects/projectmgmt/>