Maryland Transportation Systems Management and Operations

TSM&O Program Plan Roundtable
FHWA/ National Operations Center of Excellence

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Agenda

- Introductions/Background
- Overview of TSM&O Strategic Plan
- Prioritization of Strategies
- Org Set-up, Stakeholders, Communications & Outreach
- Next Steps
Introduction

The Maryland TSM&O Strategic Implementation Plan

- Summarizes a business case for TSM&O
- Establishes mission, vision, goals, objectives and performance measures for TSM&O within MDOT/SHA
- Identifies strategies and projects required to implement TSM&O
- Recommends resource needs to carry out plan
Leading up to this plan

CMM Workshop at MD SHA
March 2014

FHWA CMM Implementation Plan Meeting
August 2014

TSM&O Steering Committee Workshop
July 2015

TSM&O Executive Committee Briefing
December 2015

TSM&O Plan Approval and Ready for Implementation
May 2016

Introduction

- Apr - Jul 2014: CMM Implementation Plan Development
- Sept 2014 - Jun 2015: SHRP2 L06 Initiation/Foundational Work
- Aug - Dec 2015: TSM&O High-level Plan Development
- Jan - Apr 2016: TSM&O Plan Approval and Ready for Implementation
Introducing Strong Foundations for TSM&O
An integrated approach to programmatic optimization of planning, operations, and maintenance in implementing new and existing multi-modal systems, services, and projects to preserve capacity and improve the security, safety, and reliability of our transportation system.
TSM&O Plan Structure

Vision: Maximize mobility and reliable travel for people and goods within Maryland by efficient use of management and operations of transportation systems.

Mission: To establish and maintain a TSM&O program and implement supporting projects within Maryland SHA improving mobility and reliability for all people and goods through planned operations of transportation facilities.

Goal 1. Develop and implement a sustainable TSM&O program at SHA

Objective 1.1. Incorporate TSM&O oriented practices in various planning and programming business processes by 2016.

Objective 1.2. Promote culture supporting TSM&O both inside and outside of SHA and raise overall TSM&O awareness.

Strategy 1.1a. Develop a comprehensive plan for TSM&O at HMDOT with input from public opinion and stakeholders.

Strategy 1.1b. Develop a comprehensive plan for TSM&O with input from the public and stakeholders.

Strategy 1.2a. Identify and implement new strategies for improving TSM&O awareness.

Strategy 1.2b. Develop a comprehensive plan for TSM&O with input from the public and stakeholders.

Objective 1.2. Develop a strategic plan for TSM&O implementation.

Strategy 1.2c. Identify and implement new strategies for improving TSM&O awareness.

Goal 2. Improve travel time reliability for both people and freight.

Objective 2.1. Implement a comprehensive, system level performance measurement program to monitor mobility and reliability targets by June 2017.

Objective 2.2. Implement a comprehensive, system level performance measurement program to monitor mobility and reliability targets by June 2017.

Strategy 2.1a. Develop a comprehensive plan for TSM&O with input from the public and stakeholders.

Strategy 2.1b. Develop a comprehensive plan for TSM&O with input from the public and stakeholders.

Strategy 2.2a. Develop a comprehensive plan for TSM&O with input from the public and stakeholders.

Goal 3. Develop data- and performance-driven approaches to support TSM&O planning, programming, implementation and evaluation decisions.

Objective 3.1. Implement a comprehensive, system level performance measurement program to monitor mobility and reliability targets by June 2017.

Objective 3.2. Develop a comprehensive, system level performance measurement program to monitor mobility and reliability targets by June 2017.

Strategy 3.1a. Develop a comprehensive plan for TSM&O with input from the public and stakeholders.

Strategy 3.1b. Develop a comprehensive plan for TSM&O with input from the public and stakeholders.

Strategy 3.2a. Develop a comprehensive plan for TSM&O with input from the public and stakeholders.

Goal 4. Improve the travelling public’s experience on Maryland highways.

Objective 4.1. Achieve a user cost savings of at least $1 billion annually by effective congestion management.

Objective 4.2. Enhance travelling public’s knowledge and understanding of TSM&O operational strategies and their respective benefits.

Strategy 4.1a. Conduct public awareness campaigns to educate the travelling public about the benefits of TSM&O operational strategies.

Strategy 4.1b. Conduct public awareness campaigns to educate the travelling public about the benefits of TSM&O operational strategies.


Strategy 4.2b. Develop and implement new strategies for improving TSM&O awareness.
**Vision:** Maximize mobility and reliable travel for people and goods within Maryland by efficient use of management and operations of transportation systems

**Mission:** To establish and maintain a TSM&O program and implement supporting projects within Maryland SHA improving mobility and reliability for all people and goods through planned operations of transportation facilities

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**GOAL 1.** Develop and implement a sustainable TSM&O program at SHA

**GOAL 2.** Improve travel time reliability for both people and freight on both arterials and freeways

**GOAL 3.** Develop data and performance driven approaches to support TSM&O planning, programming, implementation and evaluation decisions

**GOAL 4.** Improve the travelling public’s experience on Maryland highways by enabling customers with information & choices
Goal 1 - Develop and implement sustainable TSM&O program within SHA to implement TSM&O

Objective 1.1 - Incorporate TSM&O oriented practices in routine planning and programming business processes by 2018

Strategy 1.1a - Identity and implement means of incorporating TSM&O into relevant agency policies

Action Items
- 1.1a.i. Evaluate the inclusion of reliability in MDOT mission, vision, and strategic plans.
- 1.1a.ii. Develop a policy and procedure for TSM&O – Draft policy statement needs to address establishing TSM&O structure (office/functional area responsibilities). The procedure will include an institutional framework for TSM&O – including roles for steering and executive committees.
- 1.1a.iii. Incorporate planning for operations in all processes within SHA - Maryland Transportation Plan 2035 and SHA Business Plan.
- 1.1a.iv. Identify methods for evaluating capacity vs. TSM&O options considering: service issues, network scale, time to implement, incremental improvement options capital operating and maintenance costs, cost-effectiveness related to relevant performance measures.

Deliverables
- 1.1a. Policy and Procedure to establish TSM&O structure for evaluating the benefits operational projects, side-by-side, with capacity projects.
- 1.1b. Inclusion of reliability in appropriate plans.
- 1.1c. Incorporation of TSM&O in SHA business processes.
- 1.1d. Report documenting quantitative improvements in travel times/speeds for Maryland based on identified TSM&O improvements. Comparison of existing eligible improvements to assess if mobility needs are met through new TSM&O projects.

Outcome
- TSM&O processes become institutionalized in the State Highway Administration.
NEPA for TSM&O Projects

- SHA has developed a Freeway/Arterial Congestion Management program that looks at low cost improvements for highly congested/unreliable hotspots/segments.
- With Practical Design Policy, SHA identifies TSM&O Strategies/Active Traffic Management (ATM) alternatives as mid term solutions.
- TSM&O alternatives are either part of Build Alternatives or, an alternative by itself in ongoing project planning/feasibility studies.
- Ongoing projects on I-270 and I-95 provide opportunity to review NEPA aspects for TSM&O elements.
TSM&O Data/ Analytics

Travel Modeling and Traffic Analysis Applications

LEVEL I (Planning)
TRAVEL DEMAND MODELS
(MSTM, MPO Models)

LEVEL II (Planning and Operations)
MESOSCOPIC MODELS

LEVEL III (Operations)
TRAFFIC SIMULATION MODELS

- Corridor Studies
- Long Range Planning
- Freight Movement
- System Performance
- Scenario Analysis

- ICM / ATM / ATDM
- Cumulative Impact Assessment
- Incident Management
- Work Zone / Special Events
- Emergency Response

- Site Analysis
  ✓ accessibility / traffic impacts
  ✓ mitigation plans assessment
- Design/Operations Projects
- Intersection/Roadway Operations
Priority Strategies and Actions

- 1.1c - Develop modifications to the SHA Project Development Process (PDP) to accommodate TSM&O
- 2.1a - Develop Arterial System Master Plan
- 2.1d - Work with MdTA, MDOT, and the private sector to develop and implement a connected/automated vehicle program in Maryland
- 2.1e - Establish a framework for an institutionalized approach to support funding and deployment of operational improvements on freeways and arterials
- 2.2a - Focus on integrated freeway and arterial management and operations
Organizational Setup

SHA Administrator

Dep. Admin Planning
- OPPE
  - TSM&O Rep
- OOTS
  - TSM&O Rep

Dep. Admin Operations
- CHART
  - TSM&O Rep
- OOM
  - TSM&O Rep
- OOC
  - TSM&O Rep

TSM&O Program Manager
Internal & External Stakeholders/Partners

- State, Regional, County, and Local
- Traveling Public and representative advocacy groups
- Professional Organizations
- USDOT units addressing TSM&O
- Special Event Venues
- Partner Disciplines and Organizations
- Business/Economic Dev. Organizations
- Academic and Research Institutions
- National Weather Service
Some of the identified expected impacts and/or concerns of key external partners include:

- Need for awareness of TSM&O
- Skepticism as to its value
- Will TSM&O have unanticipated adverse impacts that might lead to speeding, cut-through traffic, or other unsafe conditions?
- Will TSM&O meet capacity needs?
- How will the TSM&O Program blend in with the TIP process?
- What about bicyclists?
- What about pedestrians?

External Partner Communications and Outreach Plan
Strategic Plan Implementation
Near Term Priority Actions

- Developing an Integrated Freeway & Arterial Master Plan
- Developing a Performance Based Decision Support Approach along with Data & Analysis infrastructure
- Advance TSM&O policies, programs and projects thru’ implementation pilot
- Streamline processes with ongoing initiatives such as practical design, CV/AV work etc.
- Continue internal and external TSM&O communication and outreach
Cyber-Security

- The CHART ATMS operates within the MDOT Enterprise Network

- The MDOT network is firewall protected, with quarantine servers and regularly updated security software to prevent direct access into the network

- To counter cyber attacks on individual devices or sub-systems, default passwords are always changed, and the system polls devices regularly to restore central server control

- After Action Reviews (AAR) are conducted for near-incursions (we never had a successful incursion into the system)

- Admittedly, these security measures are a result of architecture decisions made in developing the CHART system, but they could be advantages to incorporating cyber-security into our TSM&O planning.
Special Events – Lessons Learned

- Maryland regularly has special events; the Star Spangled Spectacular, Washington Metro maintenance surges, Casino openings, Inaugurations, Port of Baltimore "Fleet Week".

- The key to success is coordination with stakeholders.

- It's important to include local media as a stakeholder.

- Many of the tools we currently use, Dynamic Message Signs, web sites, media broadcasts, are quite successful in preparing the public.

- For major events CHART Prepares an "Operations Plan" which discusses the disposition of Transportation Management resources, and is distributed to all agencies involved.

- MDOT SHA is looking to prepare After Action Reports for more events, with the understanding that it takes additional resources to prepare these reports and conduct reviews.
Operations in Context of Active Work Management

- The Maryland DOT State Highway Administrator has asked SHA personnel to develop more active work zone management capabilities.

- Maryland has implemented a statewide Lane Closure Permit (LCP) system, which enables SHA to manage lane closure permit applications, and then activates lane closures for management in real-time.

- SHA with UMD CATT help has developed work zone management tools and dashboards.

- SHA is working on a Work Zone Prioritization tool thru’ a FHWA SHRP2 implementation project.
In Maryland, the Traffic Management Center (the Statewide Operations Center) functions as the Emergency Operations Center, fully coordinating with Maintenance activities.

The Traffic Management program develops and supports the management system, the Emergency Operations Reporting System (EORS), used by Maintenance personnel.

Maintenance and Traffic Managers also use Automatic Vehicle Location and Vehicle Mounted Cameras to support fleet management.

Close coordination is maintained, and personnel are primarily responsible within their respective disciplines.
Reliability Metrics

- Mobility Report Analyzes system performance by calculating the Planning Time Index for key roadways.

- The CHART Traffic Incident Management program is reviewed for Number of Responses, Response Time, Clearance Time and Reduction in Delay.

- Performance is reported both to leadership and the public, through the Attainment Report and the Excelerator Program.
The Road Ahead ...

TSM&O

Operations

Planning

Performance Measures

Communications

Connected and Future Autonomous Vehicle Data

HD Signal Data

CCTV and Video Data

First Responder/CAD

ATMS & 511 Incident Reporting/Automatic assistance

Weather

Freight

Plow and Maintenance

Transit

Schedules, AVL, seating, and fare collection

Your Route
Contact Information

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