

Active Transportation And Demand Management



U.S. Department of Transportation
Federal Highway Administration

ACTIVE TRANSPORTATION AND DEMAND MANAGEMENT (ATDM) WEBINAR SERIES

Webinar #4: Organizing for ATM: Applying the Traffic Management Capability Maturity Framework

January 22, 2015



Federal Highway Administration
Office of Operations – Transportation Management



Agenda

- Housekeeping
- Webinar Purpose, Project Background, ATDM Overview
- Presentations and Introductions
 1. TSMO Capability Maturity Model (CMM) and Implementing SHRP2 Organization for Reliability Tools
 2. FHWA's Capability Maturity Frameworks (CMFs) for Transportation Systems Management and Operations
 3. An Overview of the Traffic Management CMF (TM CMF)
 4. TM CMF In Use – Los Angeles Case Study
 5. Utilizing the TM CMF Tool
- Concluding Discussion



Today's Speakers



Jim Hunt

*Transportation Specialist, FHWA
Office of Operations, Congestion
Management and Pricing Team*



Joe Gregory

*Transportation Specialist, FHWA
Office of Operations, Operations
Deployment Team*



Wayne Berman

*Team Leader, FHWA Office of
Operations, Congestion
Management and Pricing Team*



Beverly Kuhn

*Division Head, Texas A&M
Transportation Institute, Systems
Reliability Division*



Today's Speakers (continued)



Ali Zaghari

*Deputy District Director, Caltrans
District 7, Division of Traffic
Operations*



Robert Brydia

*Research Scientist, Texas A&M
Transportation Institute, Systems
Reliability Division*



ATDM Webinar Series

- This is the fourth in a series of ATDM webinars
- Topics based on **what matters most to you!**
- ATDM webinars:
 - **Previously Recorded:**
 - Webinar #1: Active Demand Management (Oct 2014)
 - <https://connectdot.connectsolutions.com/p6byoty6abj/>
 - Webinar #2: Active Traffic Management Feasibility Screening (Nov 2014)
 - <https://connectdot.connectsolutions.com/p34emklqwh/>
 - Webinar #3: Ramp Metering (Dec 2014)
 - <https://connectdot.connectsolutions.com/p53nkrawi1p/>
 - **Coming Up:**
 - Webinar #5: National ATDM Program Research (March 2015)
 - For more information: <https://www.nhi.fhwa.dot.gov/about/realsolutions.aspx>



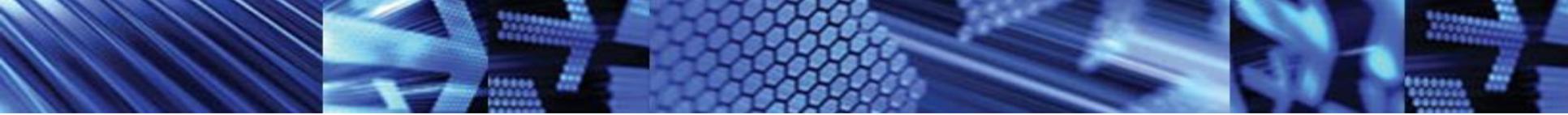
*Improving the
Performance of
the Transportation
Industry Through
Training*





WEBINAR PURPOSE, PROJECT BACKGROUND





Purpose of Today's Webinar

1. Explain the value of the TM CMF

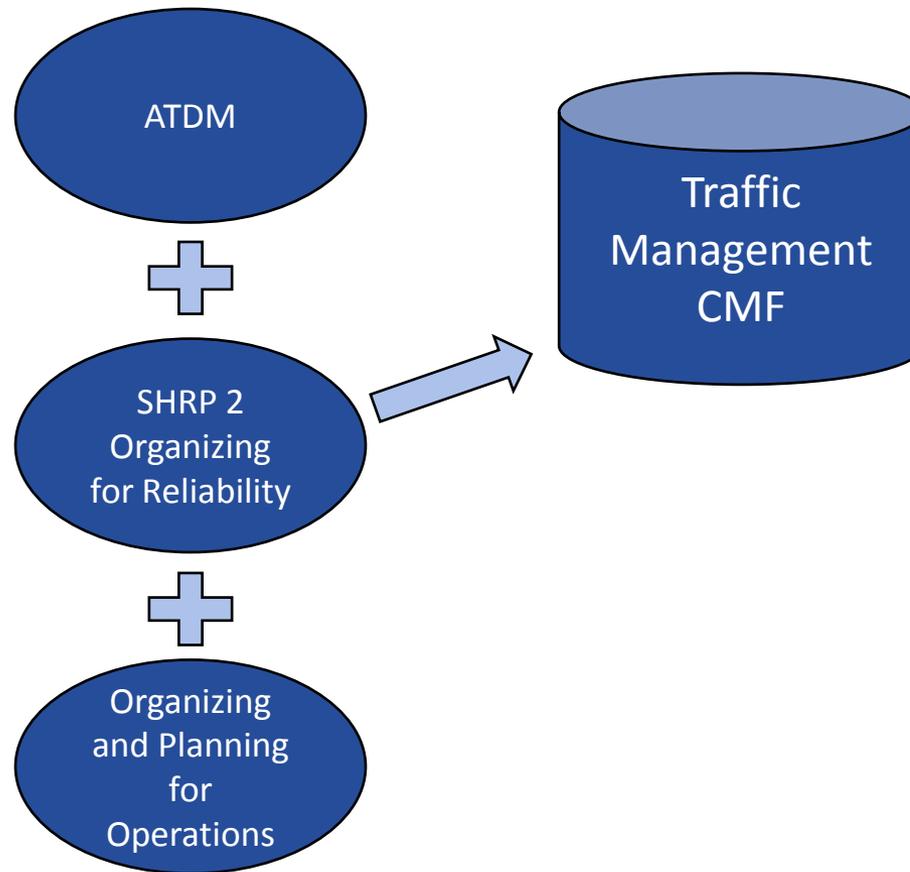
- Overview
- Show how TM CMF output can be used by agencies to enhance traffic management practices

2. Describe CM tools and content of CMF

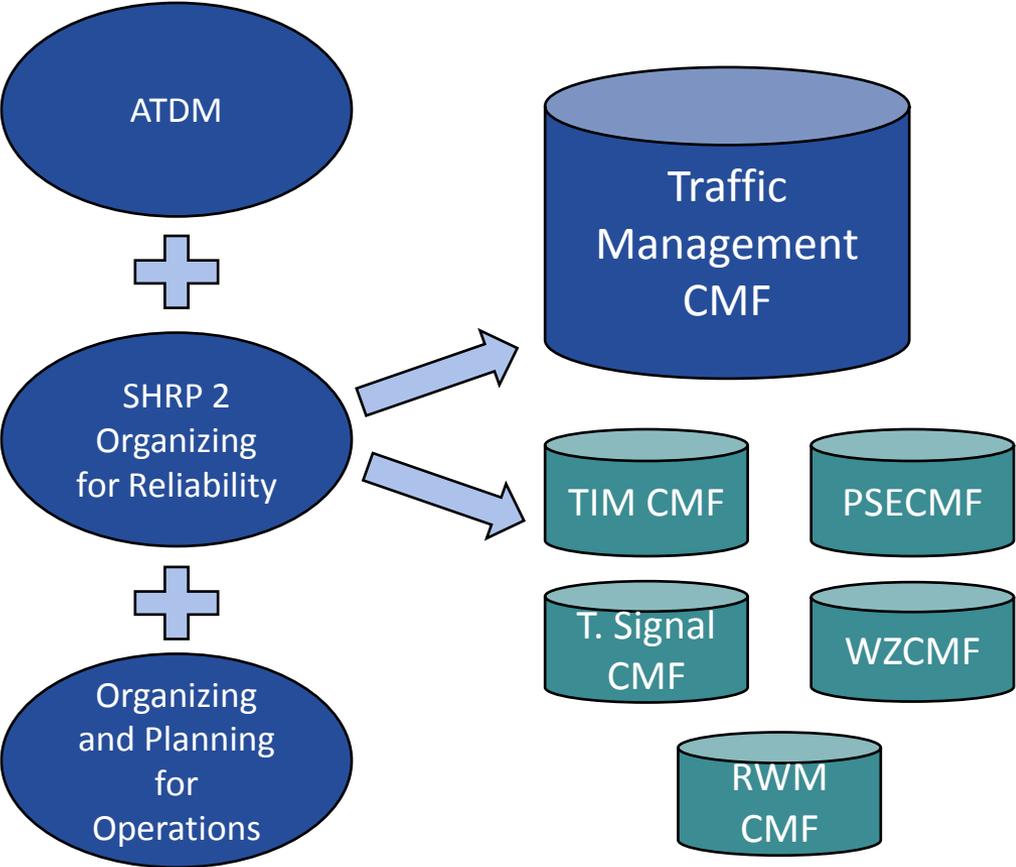
- Context of AASHTO CMM and National efforts
- Provide a preview into the other five FHWA operations business process frameworks
- Provide an overview and demonstration of TM CMF



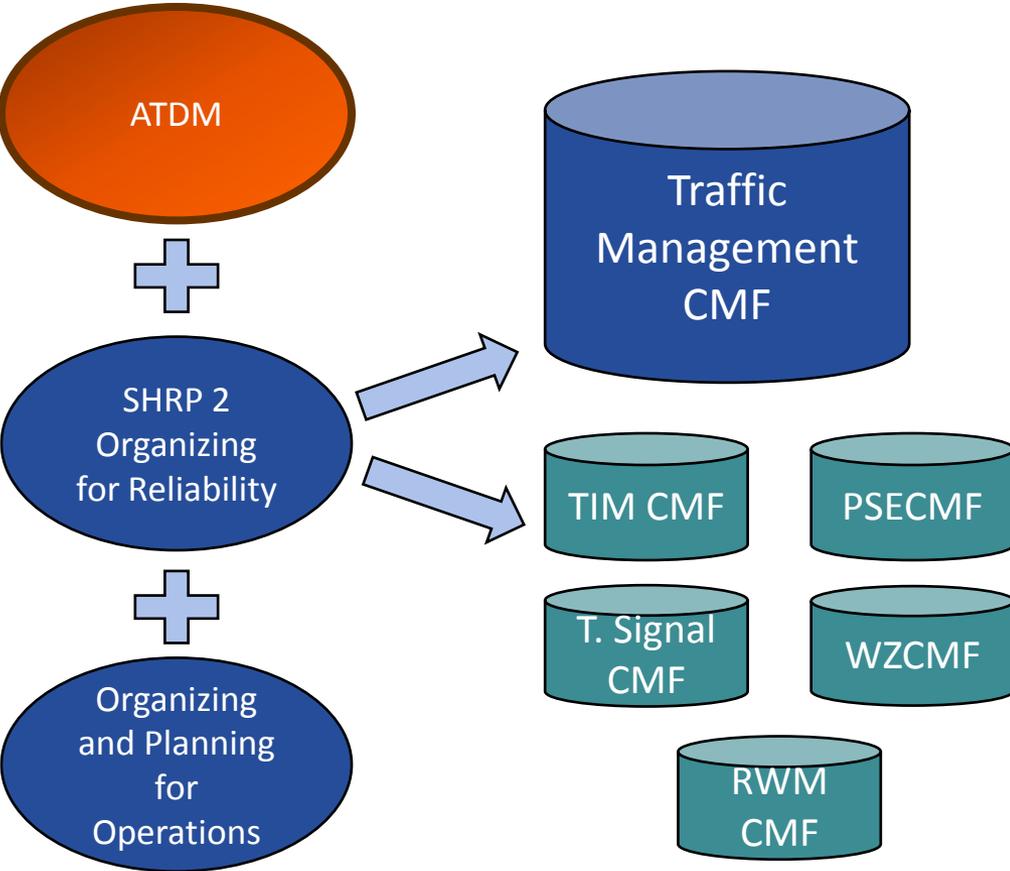
Program Drivers for TM CMF Project



Program Drivers for TM CMF Project



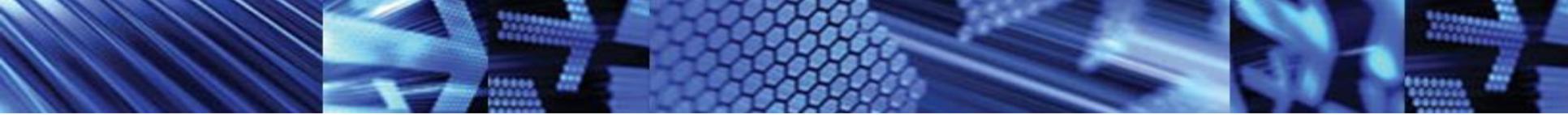
Program Drivers for TM CMF Project





OVERVIEW OF ACTIVE TRANSPORTATION AND DEMAND MANAGEMENT





ATDM: The Big Picture

- ATDM represents next evolutionary step in Transportation Systems Management & Operations (TSMO)
 - Dynamic, predictive, proactive, performance driven, continuous monitoring, supply and demand oriented



What is Active Management?

The fundamental concept of taking a dynamic approach to a performance based process



What does ATDM include?



Active Demand Management (ADM): A suite of strategies intended to reduce or redistribute travel demand to alternate modes or routes. Incentivizes drivers by providing rewards for travelling during off peak hours with less traffic congestion.



Active Traffic Management (ATM): A suite of strategies that actively manage traffic on a facility.



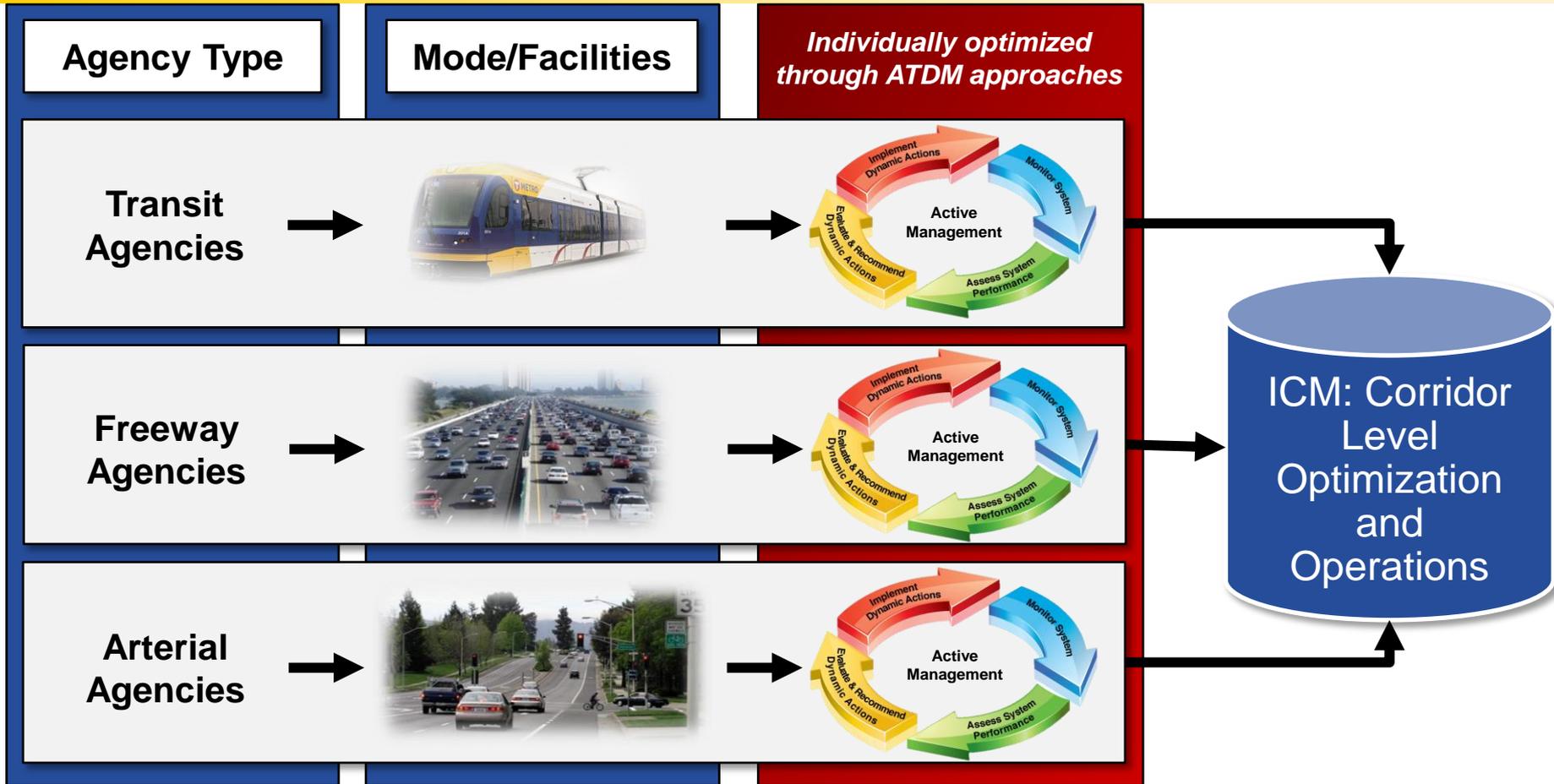
Active Parking Management (APM): A suite of strategies designed to affect the demand on parking capacity.

Examples of ATDM Implementation Strategies

ADM	Comparative multi-modal travel times, dynamic ride-sharing, pricing, and incentive approaches.
ATM	Variable speed limits, dynamic shoulder use, queue warning, lane control.
APM	Parking pricing, real-time parking availability and reservation systems.



Active Management in a Corridor





ATDM Program

Guidance, Outreach, Tools, Tech. Transfer

■ Guidance and tools

- Shoulder Guidance
- ATM Screening and Feasibility
- Active Demand Management Primer
- Traffic Management Capability Maturity Framework
- Capability Maturity Frameworks for Managing Non-Recurrent Congestion
- Dynamic Pricing Primer

■ Knowledge and Technology Transfer

- Informational Briefs
- Public Relations Resources Guide
- Workshops/Peer Exchanges
- Lessons Learned
- Peer to Peer
- Videos

FHWA's ATDM Website:

<http://ops.fhwa.dot.gov/atdm/about/program.htm>





ATDM Program

Guidance, Outreach, Tools, Tech. Transfer

■ Guidance and tools

- Shoulder Guidance
- ATM Screening and Feasibility
- Active Demand Management Primer
- **Traffic Management Capability Maturity Framework**
- Capability Maturity Frameworks for Managing Non-Recurrent Congestion
- Dynamic Pricing Primer

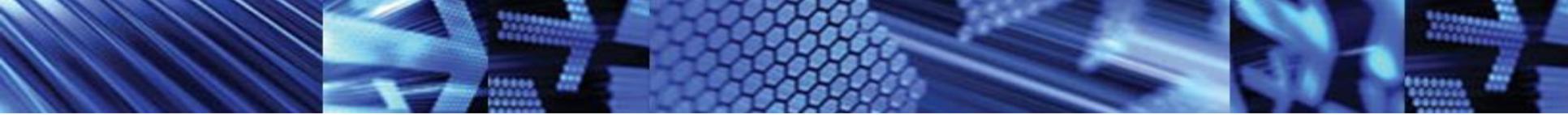
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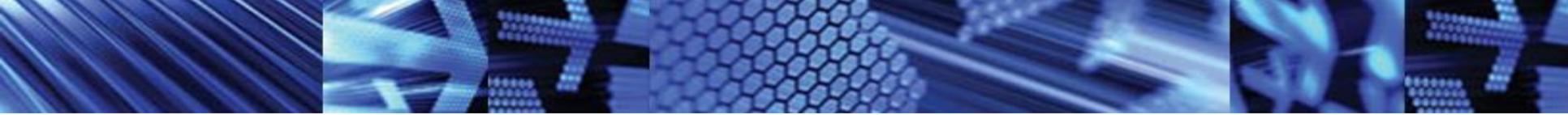
<http://ops.fhwa.dot.gov/atdm/about/program.htm>





OVERVIEW CAPABILITY MATURITY FRAMEWORK PROJECT

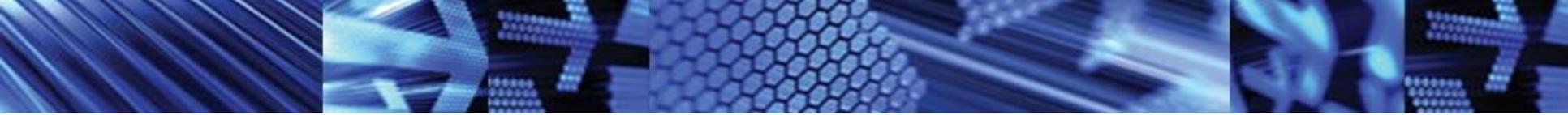




Why Develop the TM CMF?

- ATDM early adopter lessons point to need for organizational foundation
 - Workforce, performance measures, culture, collaboration, business processes, systems and technology
- Create a tool for self-evaluation and prioritizing strategic and tactical improvements for traffic management
- Make the framework available as an on-line tool

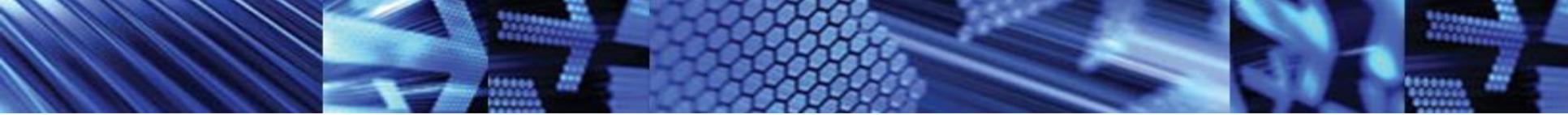




CMF Status

- Traffic Management CMF Content complete
 - Completed validation workshops
 - Tool in final stages of testing and approval
 - Workshops to follow
- Other Business Process CMF's almost complete
 - Workshops to follow
- Migration to FHWA web site planned





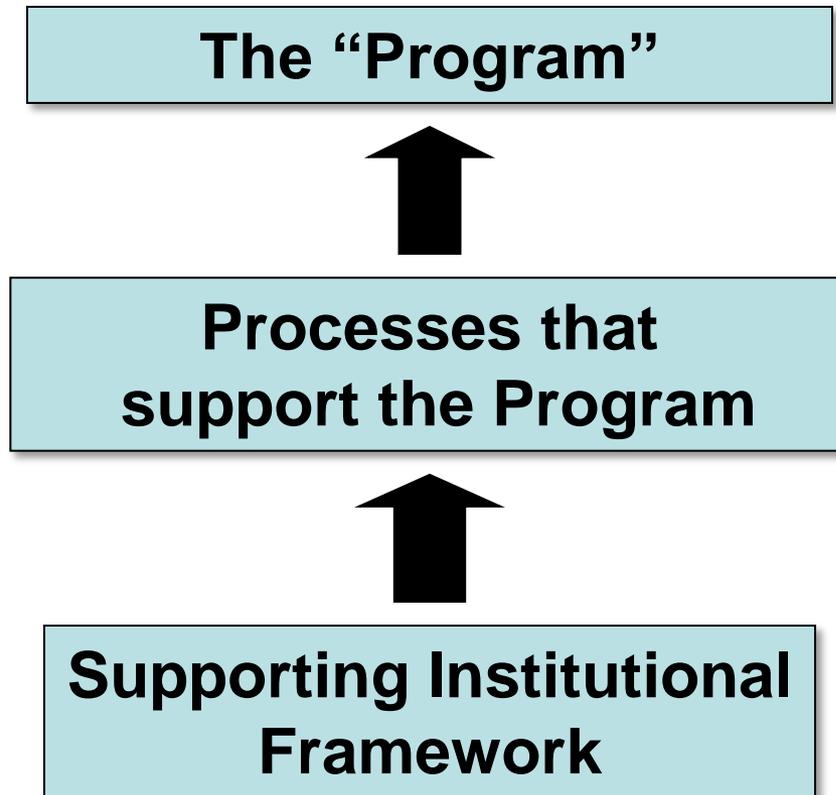
Joe Gregory

*Transportation Specialist, FHWA Office of Operations, Operations
Deployment Team*

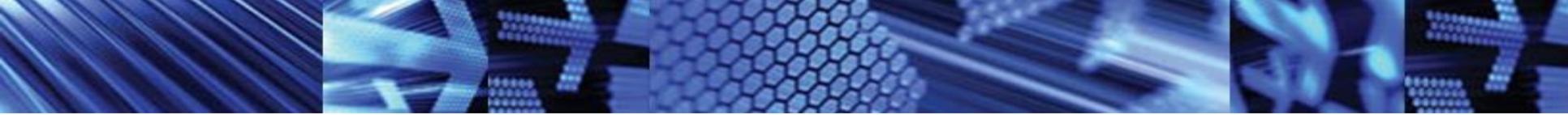
TOPIC 1: TSM&O CAPABILITY MATURITY MODEL AND IMPLEMENTING SHRP2 ORGANIZATION FOR RELIABILITY TOOLS



What Supports More Effective Regional Operations?



- Effective TSMO performance based on continuing capability improvement
- Effective & sustainable programs require specific business/technical processes
- Supportive processes depend on organization, staff capabilities & relationships



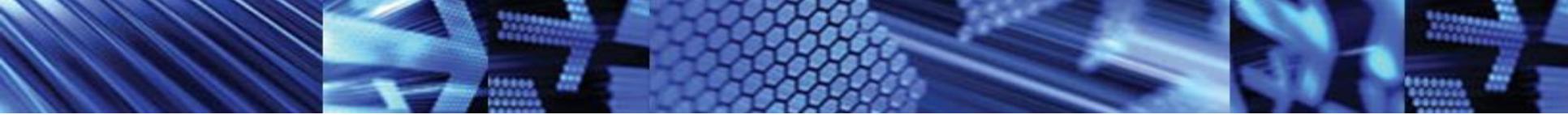
Beyond “Projects”: Keys to Successful Implementation

- Supportive business and technical process key
- Formal organizational structure and collaboration

Example: Incident Management – combination of:

- ITS infrastructure
- Traffic management center
- Multi-jurisdictional participation (DOTs/Public Safety Agencies)
- Integrated communications
- Pre-defined procedures and protocols and co-training
- Private sector participation & incentives
- Performance measurement/ after-action analysis



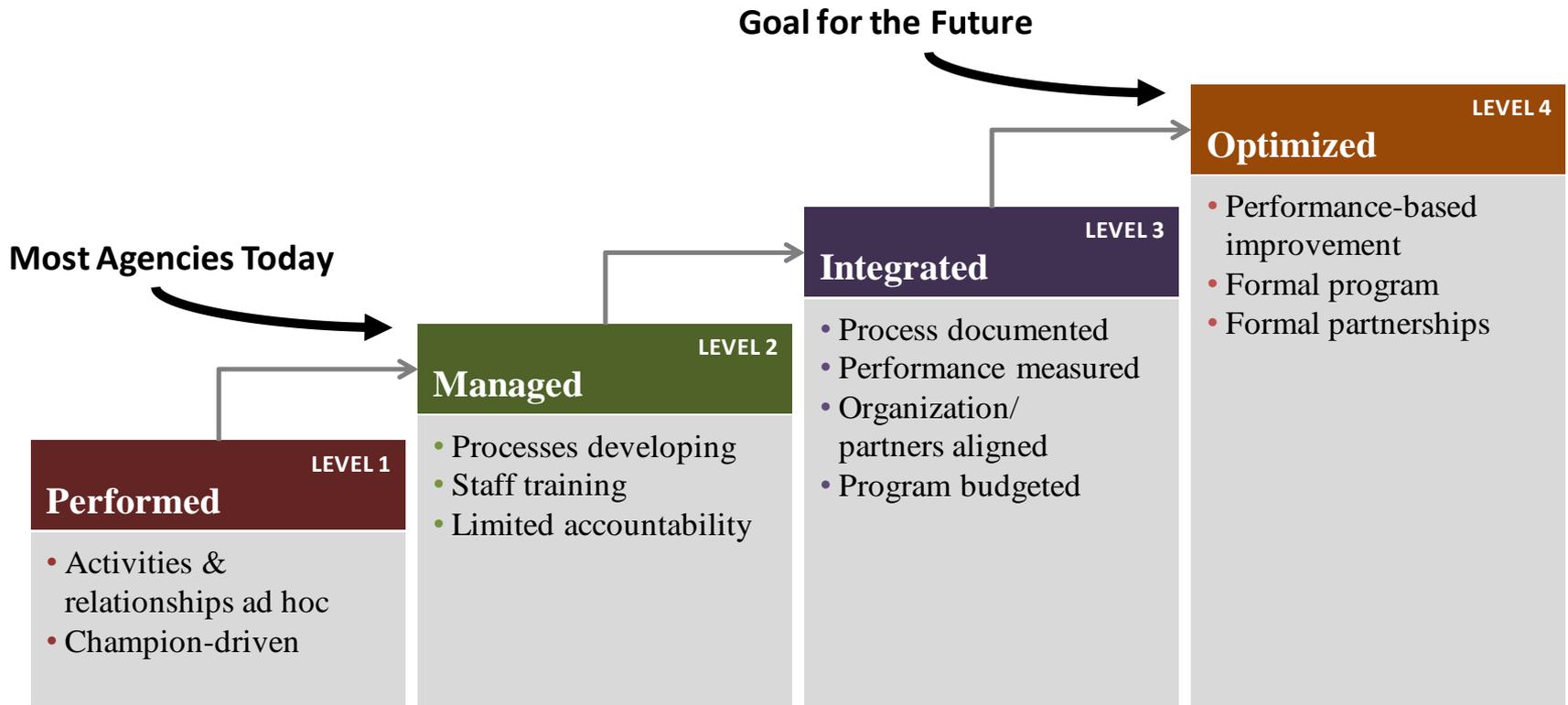


Preconditions to Effectiveness (Dimensions of Capability)

- 1. Business Processes**
 - Planning, programming, budgeting, implementation
- 2. Systems & Technology**
 - Systems engineering, standards, documentation
- 3. Performance Measurement**
 - Measures, data & analytics, utilization
- 4. Culture**
 - Technical understanding, leadership, outreach, authority
- 5. Organization/Workforce**
 - Organization structure/ workforce capabilities
- 6. Collaboration**
 - Partnerships - public and private

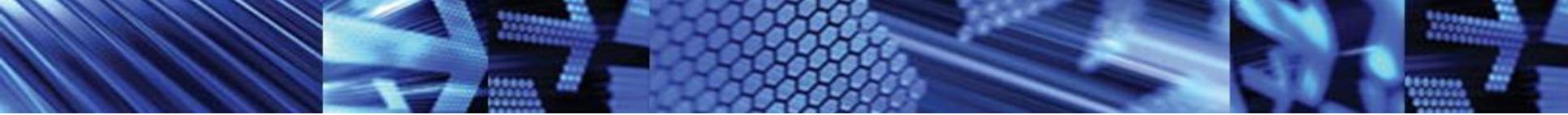


“Levels” of Capability (For Each Dimension)



Capability Level Matrix

CAPABILITY LEVEL CRITERIA FOR AGENCY TSM&O SELF ASSESSMENT				
DIMENSIONS	LEVEL 1 PERFORMED	LEVEL 2 MANAGED	LEVEL 3 INTEGRATED	LEVEL 4 OPTIMIZING
Business Processes (Planning and Programming)	Each jurisdiction doing its own thing according to individual priorities and capabilities	Consensus regional approach developed regarding TSM&O goals, deficiencies, B/C, networks, strategies and common priorities	Regional program integrated into jurisdictions' overall multimodal transportation plans with related staged program	TSM&O integrated into jurisdictions' multi-sectoral plans and programs, based on formal continuing planning processes
Systems and Technology	Ad hoc approaches to system implementation without consideration of systems engineering and appropriate procurement processes	Regional conops and architectures developed and documented with costs included; appropriate procurement process employed	Systems & technology standardized and integrated on a regional basis (including arterial focus) with other related processes and training as appropriate	Architectures and technology routinely upgraded to improve performance; systems integration/interoperability maintained on continuing basis
Performance Measurement	Some outputs measured and reported by some jurisdictions	Output data used directly for after-action debriefings and improvements; data easily available and dashboarded	Outcome measures identified (networks, modes, impacts) and routinely utilized for objective-based program improvements	Performance measures reported internally for utilization and externally for accountability and program justification
Culture	Individual staff champions promote TSM&O - varying among jurisdictions	Jurisdictions' senior management understands TSM&O business case and educates decision makers/public	Jurisdictions' mission identifies TSM&O and benefits with formal program and achieves wide public visibility/understanding	Customer mobility service commitment accountability accepted as formal, top level core program of all jurisdictions
Organization/ Staffing	TSM&O added on to units within existing structure and staffing - dependent on technical champions	TSM&O-specific organizational concept developed within/among jurisdictions with core capacity needs identified, collaboration takes place	TSM&O Managers have direct report to top management; Job specs, certification and training for core positions	TSM&O senior managers at equivalent level with other jurisdiction services and staff professionalized
Collaboration	Relationships ad hoc, and on personal basis (public-public, public-private)	Objectives, strategies and performance measures aligned among organized key players (transportation and public safety agencies) with after-action debriefing	Rationalization/ sharing/ formalization of responsibilities among key players through co-training, formal agreements and incentives	High level of TSM&O coordination among owner/operators (state, local, private)



The Rules of Improving TSMO Capability

- The objective is *continuous* improvement
- All (6) dimensions are essential/synergistic
- Dimension at the lowest level is the constraint
- Levels of capability can not be skipped



Putting It Together: Capability Self Assessment

Capability Level Self Evaluation Structure				
DIMENSIONS	LEVEL 1 PERFORMED	LEVEL 2 MANAGED	LEVEL 3 INTEGRATED	LEVEL 4 OPTIMIZING
Business Processes		X		
Systems & Technology			X	
Performance Measurement	X			
Culture			X	
Organization/ staffing		X		
Collaboration			X	

Lowest level is constraint



AASHTO Guide

<http://www.aashtotsmoguidance.org/>

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WEB-BASED PUBLICATION

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What Is Transportation Systems Management and Operations (TSM&O)?

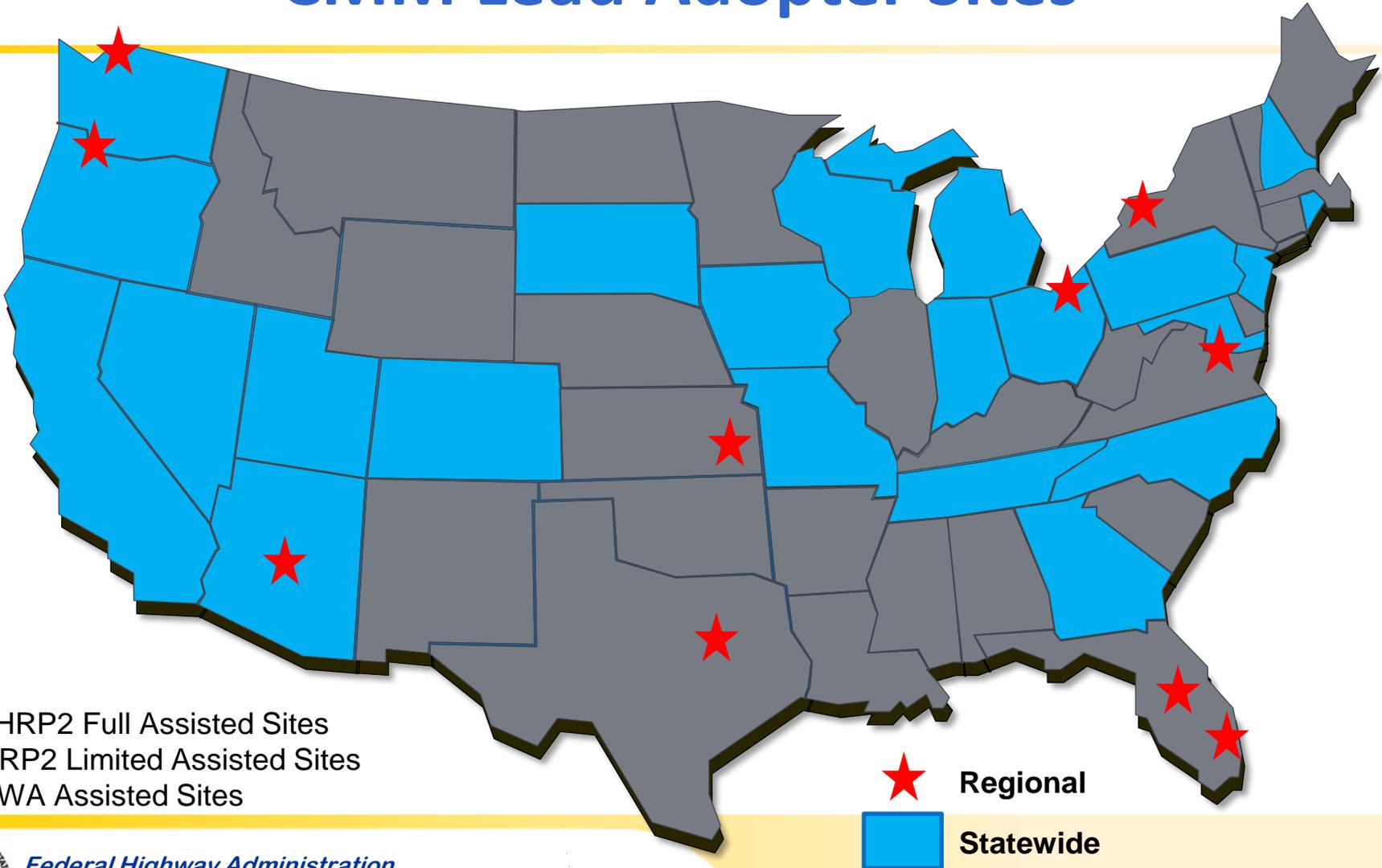
Transportation Systems Management and Operations (TSM&O) is a set of strategies to anticipate and manage traffic congestion, and minimize the other unpredictable causes of service disruption, delay, and crashes. This website is an online tool that uses self-evaluation and best practice experience that managers can use to identify key program, process and institutional preconditions to achieve more effective TSM&O. [Learn More >](#)

GUIDANCE TO IMPROVE THE EFFECTIVENESS OF YOUR TSM&O PROGRAM

One-Minute

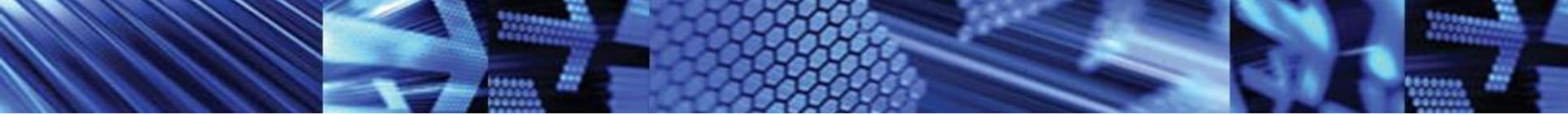


CMM Lead Adopter Sites



20 SHRP2 Full Assisted Sites
7 SHRP2 Limited Assisted Sites
5 FHWA Assisted Sites





Wayne Berman

Team Leader, FHWA Office of Operations, Congestion Management and Pricing Team

TOPIC 2: FHWA'S CAPABILITY MATURITY FRAMEWORKS FOR TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS



Developing Six Program Area CMF's

FHWA continues the development of these capability frameworks to support improvements at the program-level

- Traffic Incident Management
- Planned Special Events
- Work Zone Management
- Road Weather Management
- Traffic Signal Management
- Traffic Management

Benefits

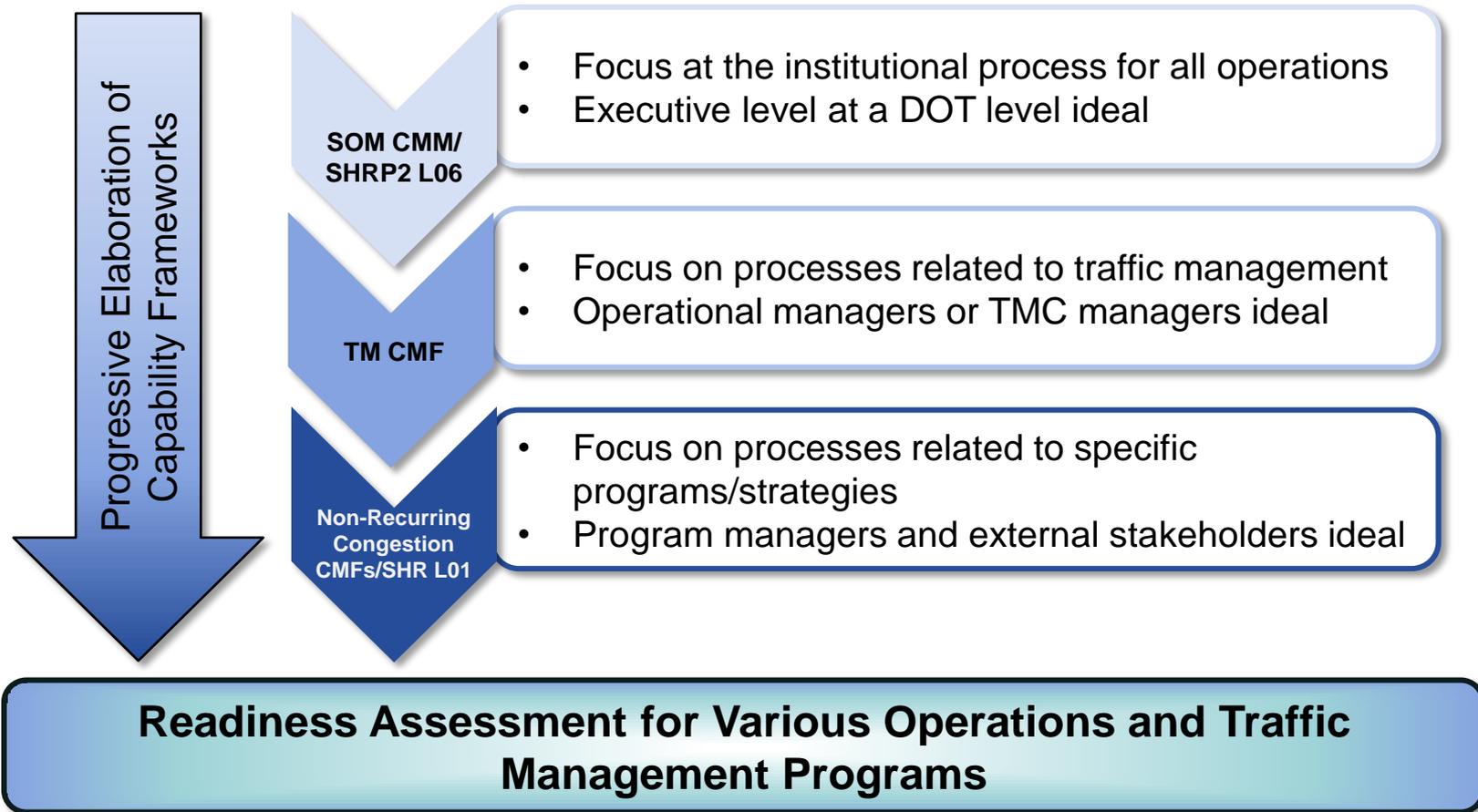
- Provides Program-level assessment of capability
- Involves external stakeholders with specific interest in the program
- Facilitates a bottom-up approach to overall TSMO capability
- Supports SHRP2 implementation States in fleshing out implementation strategies

"I strongly believe that you are heading in the right direction with this effort"

- State DOT Reviewer of the RWMP CMF



Progressive Elaboration of Capability



Stakeholder-Driven Process

Development

- Development team includes FHWA, Resource Center Contractor Team
- Engaged a panel of about 7-10 State and local agencies for EACH framework
- Conducted 3-4 webinars for each framework

Validation

- In-person workshop to test the use of the framework in a real-world setting for EACH framework
- Each interactive workshop results in meaningful actions for the host agency as well as feedback on the utility of the framework

Coordination

- SHRP2 L01 Primers/Workshop development
- Other FHWA contracts that need coordination with CMFs (TIM Self-Assessment, Work Zone Self-Assessment, Traffic Signal Management Plan)



Example: Framework Considerations for TIM

Key Characteristics	Necessary Stakeholders beyond DOT
<ul style="list-style-type: none"> • Program effectiveness is dependent upon the collective actions of personnel in law enforcement, fire and rescue operations, emergency medical services, transportation, and towing and recovery. • Multi-disciplinary and multi-jurisdictional nature • Emerging public-private partnerships especially for towing and recovery. 	<ul style="list-style-type: none"> • Emergency Responders (Police, Fire) • Towing Agencies • Maintenance Community
	<p data-bbox="1020 631 1742 676">Existing Capability Assessment Tools</p> <ul style="list-style-type: none"> • TIM Self Assessment Tool (Developed by FHWA) • Guide for Emergency Transportation Operations (NCHRP 525)
<p data-bbox="575 868 1379 913">Challenges for Framework Development</p>	
<ul style="list-style-type: none"> • TIM's role in the Planning Process is not mature • Differing TIM/Planning Perspectives • Law enforcement and Fire are often the decision-drivers and they are difficult to engage in planning discussions • Scope of incident drives available and needed capability (i.e., incident management and emergency operations are related but different in terms of the capabilities needed) • Constant change in workforce personnel • Sheer number of agencies involved in response is a challenge 	



Contents of Framework

- Follows the same dimensions and levels as the SHRP2/AASHTO SOM Guidance
- Questions/capability levels are targeted at each program
- Actions are defined from a specific program perspective

- Framework results include:

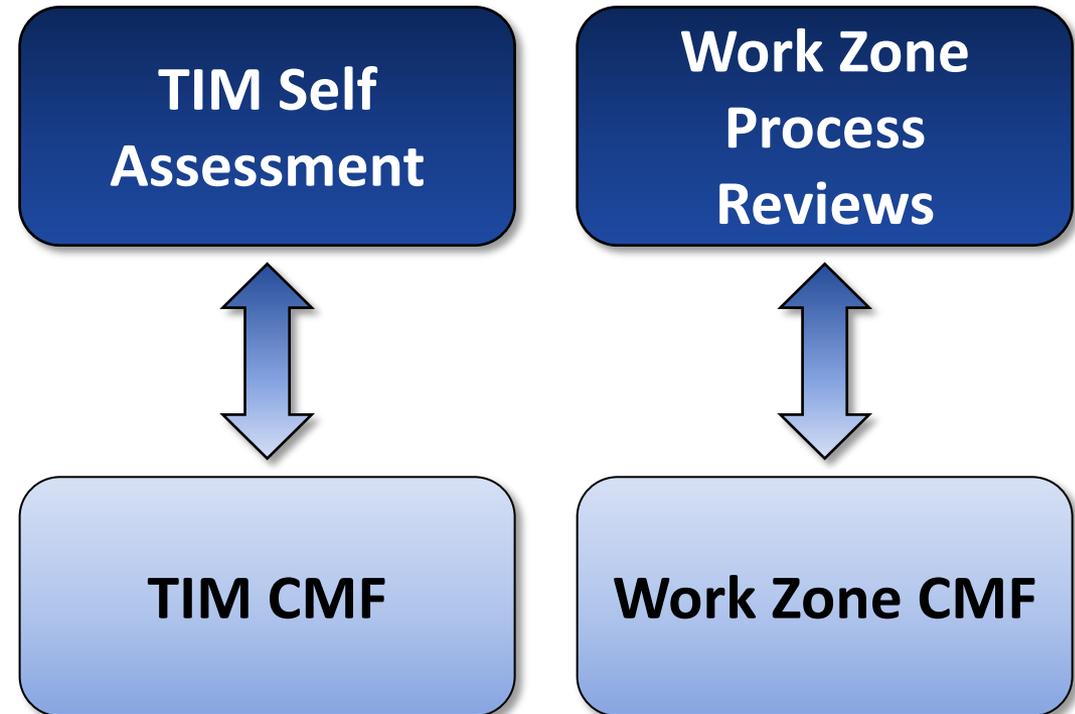
- Agency or regional findings related to capability
- Capability assessment by dimension
- Suggested actions for improvement

Dimensions or Process Area	What is it	Level 1 Ad-Hoc. Low Level of Capability	Level 2	Level 3	Level 4 Optimized. High level of capability
Business Process	Plans, Programs, Budgets	Statement of capability	..	..	..
Systems & Tech	Approach to building systems	..	..	..	..
Perf. Measurement	Use of performance measures	..	..	..	..
Workforce	Improving capability of workforce	..	..	..	..
Culture	Changing culture and building champions	..	..	..	..
Collaboration	Improving working relationships	..	..	..	..

Linked with Existing Program-Level Assessments

Designed to work with existing program-level assessments

- Enhance current outputs generated from existing self-assessments and process reviews for the program area



Implementation: Workshops

■ Objectives:

- Support the broad adoption and deployment of CMFs
 - Build a base of users/practitioners who are aware of the tools and can use it under various settings
- Coordinate delivery across various activities
 - SHRP2 Implementation
 - TIM Self Assessments
 - WZ Process Reviews
 - Traffic Signal Management Plans
- Provide flexibility to accommodate different program/agency/regional needs
- Developed with future deliveries by FHWA in mind
(Resource Center, Division Offices)

Workshop Schedule
March 2015 to March 2016





Beverly T. Kuhn, Ph.D., P.E.

Senior Research Engineer, Texas A&M Transportation Institute

**TOPIC 3: AN OVERVIEW OF THE TRAFFIC
MANAGEMENT CAPABILITY MATURITY
FRAMEWORK (TM CMF)**





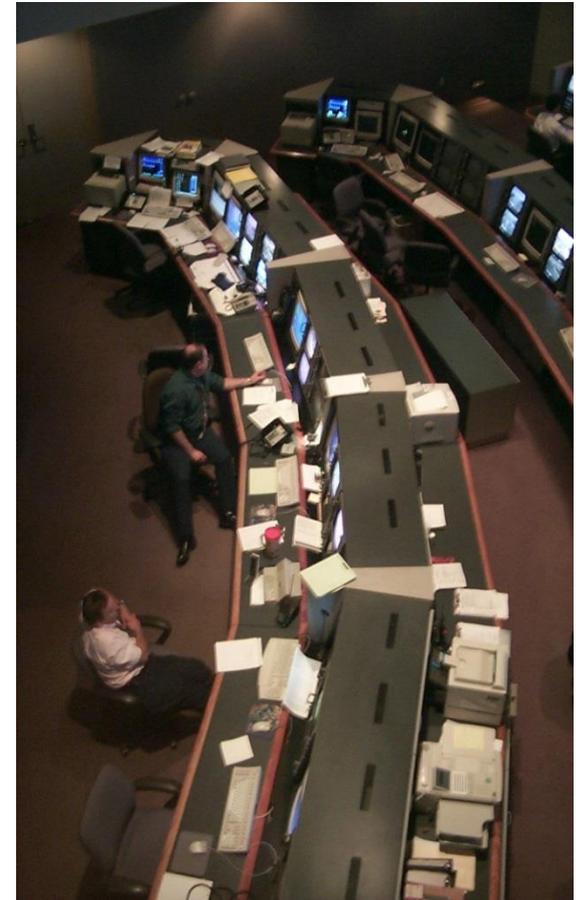
Traffic Management CMF and ATDM

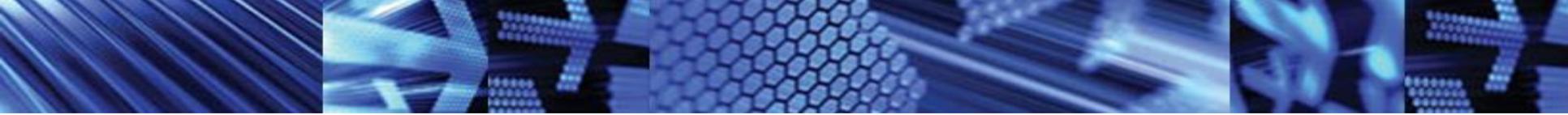
- Initial intent to develop an ATM capability framework.
- Determined that a broader approach was needed across all traffic management activities.
- Supports agency efforts to advance along the active management continuum.



Traffic Management CMF

- Focus on traffic management rather than all organizational functions.
- Not strategy-specific.
- Specific process areas that are applicable to traffic management concerns.
- Actions are **from a traffic manager's perspective** but require input and coordination from others.

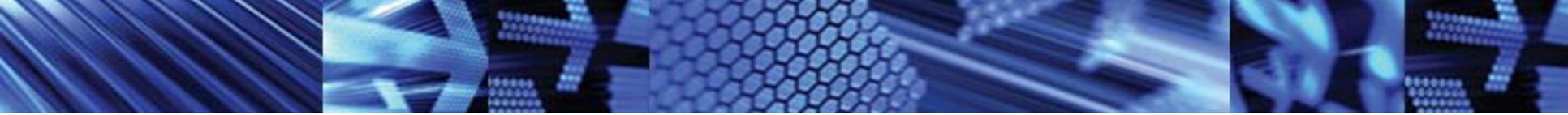




Agency or Region or Corridor?

- Capabilities exist in agencies.
- Together, they provide the capabilities for the region or corridor.
 - Differences in capabilities are normal but can be a challenge when looking regionally or for a corridor.
 - Differences in agencies can constrain regional responses.
- Actions can be:
 - Agency-level
 - Multi-Agency
 - Regional



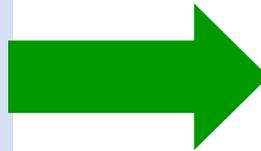


Moving From Level 1 to Level 2

Dimension – Systems & Technology

Level 1

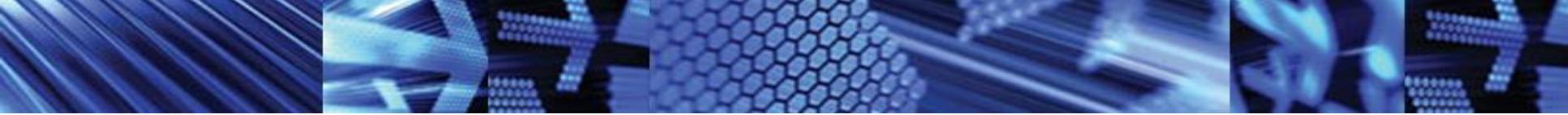
- Traffic management approaches are developed on an ac hoc basis independent of the systems engineering process.



Level 2

- Systems engineering process and ITS architecture are consistently applied within the traffic management context.





Moving From Level 1 to Level 2: Dimension – Systems and Technology

Example Actions by Sub-dimension

- Integration/Interoperability
 - Create baseline IT capability to access, analyze, and retain data from new technology/pilot deployments.
 - Implement a decision-support framework within the agency to identify, assess, adopt, and implement new technologies and tools for traffic management.
- Regional Architectures
 - Update regional architecture periodically to reflect expanding needs as new projects warrant.
- Project Systems Engineering/Testing and Validation
 - Use regional traffic management plan in project planning and project selection process.



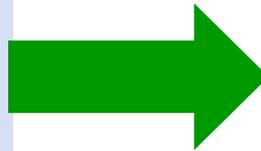


Moving From Level 2 to Level 3

Dimension – Systems & Technology

Level 2

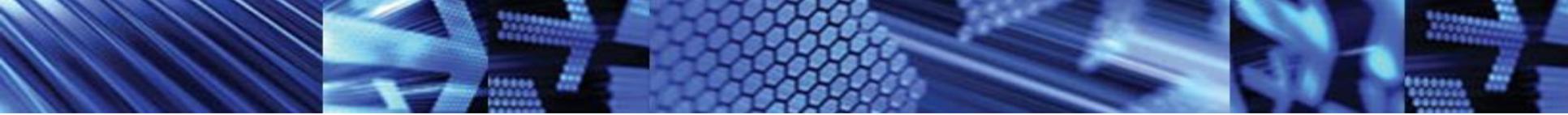
- Systems engineering process and ITS architecture are consistently applied within the traffic management context. Agencies apply advancements and technologies in spot locations.



Level 3

- Agencies apply advanced technologies with a limited level of automation. Traffic management systems are replicated and integrated within operations, with standardized documentation.



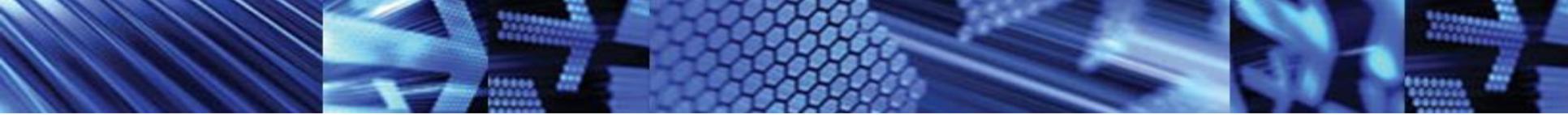


Moving From Level 2 to Level 3: Dimension – Systems and Technology

Example Actions by Sub-dimension

- Integration/Interoperability
 - Ensure IT structure has knowledge and expertise to handle complex integration requirements for new systems and technologies.
 - Create and implement comprehensive plan to update operator capabilities on a consistent basis across systems and in conjunction with future traffic management deployments.
- Regional Architectures
 - Use regional architecture in congestion management, safety planning, and project selection process.
- Project Systems Engineering/Testing and Validation
 - Explore alternative procurement procedures.



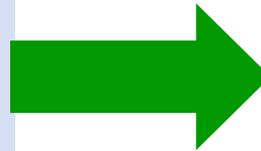


Moving From Level 3 to Level 4

Dimension – Systems & Technology

Level 3

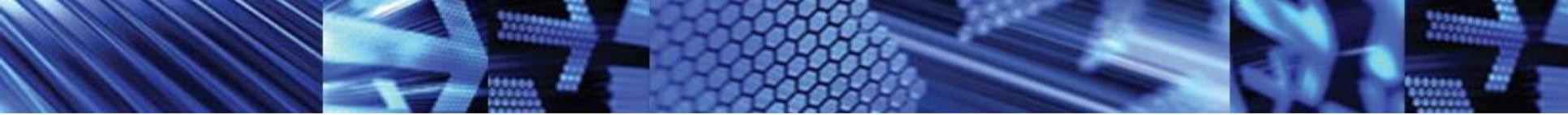
- Agencies apply advanced technologies with a limited level of automation. Traffic management systems are replicated and integrated within operations, with standardized documentation.



Level 4

- Automation of traffic management processes is based on historical, current, and predicted data. New and emerging technologies are deployed on a continuous basis to improve system efficiency.



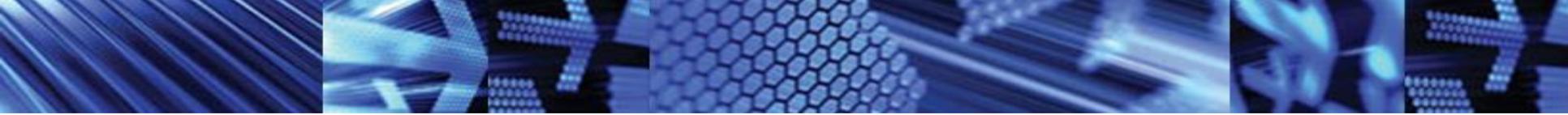


Moving From Level 3 to Level 4: Dimension – Systems and Technology

Example Actions by Sub-dimension

- Integration/Interoperability
 - Develop IT staffing to the point where the capability exists to rapidly integrate new data, technologies, or systems into existing agency enterprise systems.
 - Enhance installed technology solutions to allow for autonomous operations without operator oversight.
- Regional Architectures
 - Establish configuration management for changes to ITS architecture.
- Project Systems Engineering/Testing and Validation
 - Establish joint procurement and contractual agreements among agencies to share/leverage available resources in deployment and TSM&O of traffic management.

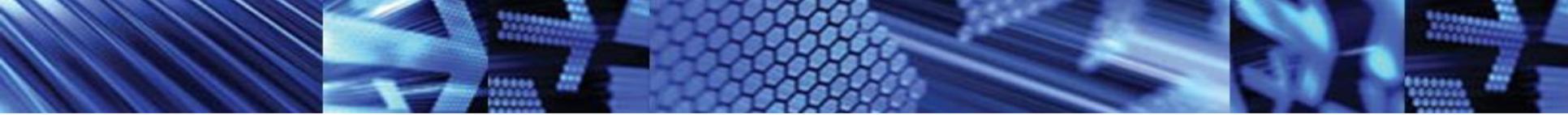




Actions

- Provides definition, rationale, and responsible party
- Focus should be on the lowest rated dimension since that is your primary constraint.
- Actions are not prescriptive; can be modified, improved, changed, or CREATED
- Not all actions need to be implemented right now
- Identify a champion
- Think in 6-month increments
- If actions from other levels make sense, use them!





Ali Zaghari, P.E., PMP

Deputy District Director, Traffic Operations at Caltrans, District 7

TOPIC 4: TM CMF IN USE – LOS ANGELES CASE STUDY



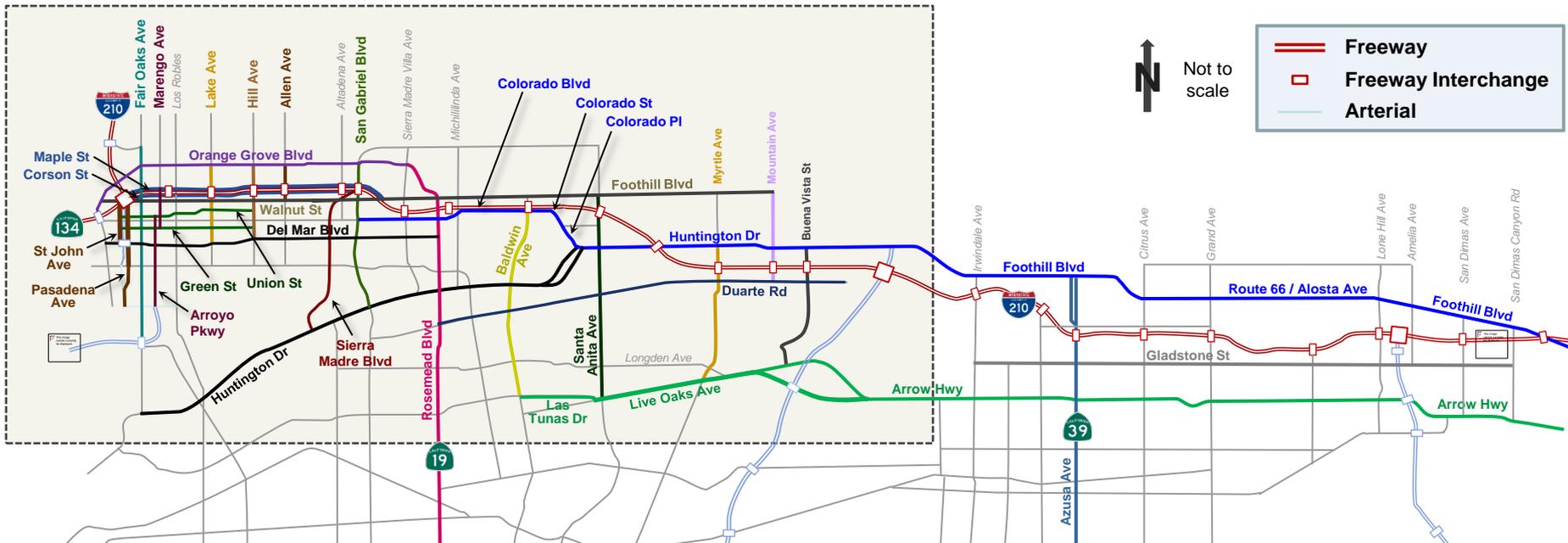
TM CMF, Los Angeles Case Study

- FHWA Sponsored Workshop Conducted on March 13, 2014
 - Deepak Gopalakrishna and Rachel Klein (Battelle), Beverly Kuhn (Texas A&M TI), and Wayne Berman (FHWA)
- Connected Corridors Pilot on I-210 as the regional context
- Participants:
 - FHWA (Cal Div), Caltrans, CHP, LA Metro, LA County Public Works, Cities of Los Angeles, Pasadena, and Arcadia,



I-210 Project Corridor and Caltrans Partners

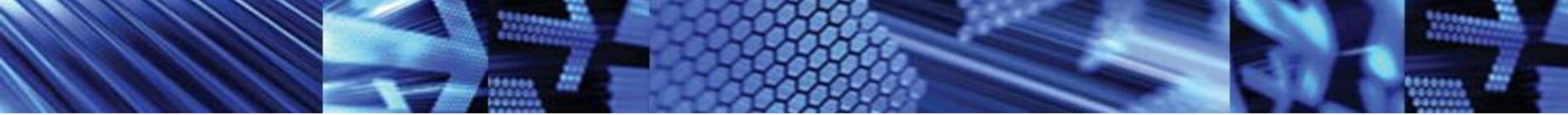
Phase 1 Area of Interest



Current Partners Identified (but are not limited to):

- Caltrans, Metro, UC Berkeley PATH, LA County, Pasadena, Arcadia, Monrovia, Duarte, (Phase 2 - Irwindale, Azusa, Glendora, San Dimas, and La Verne)



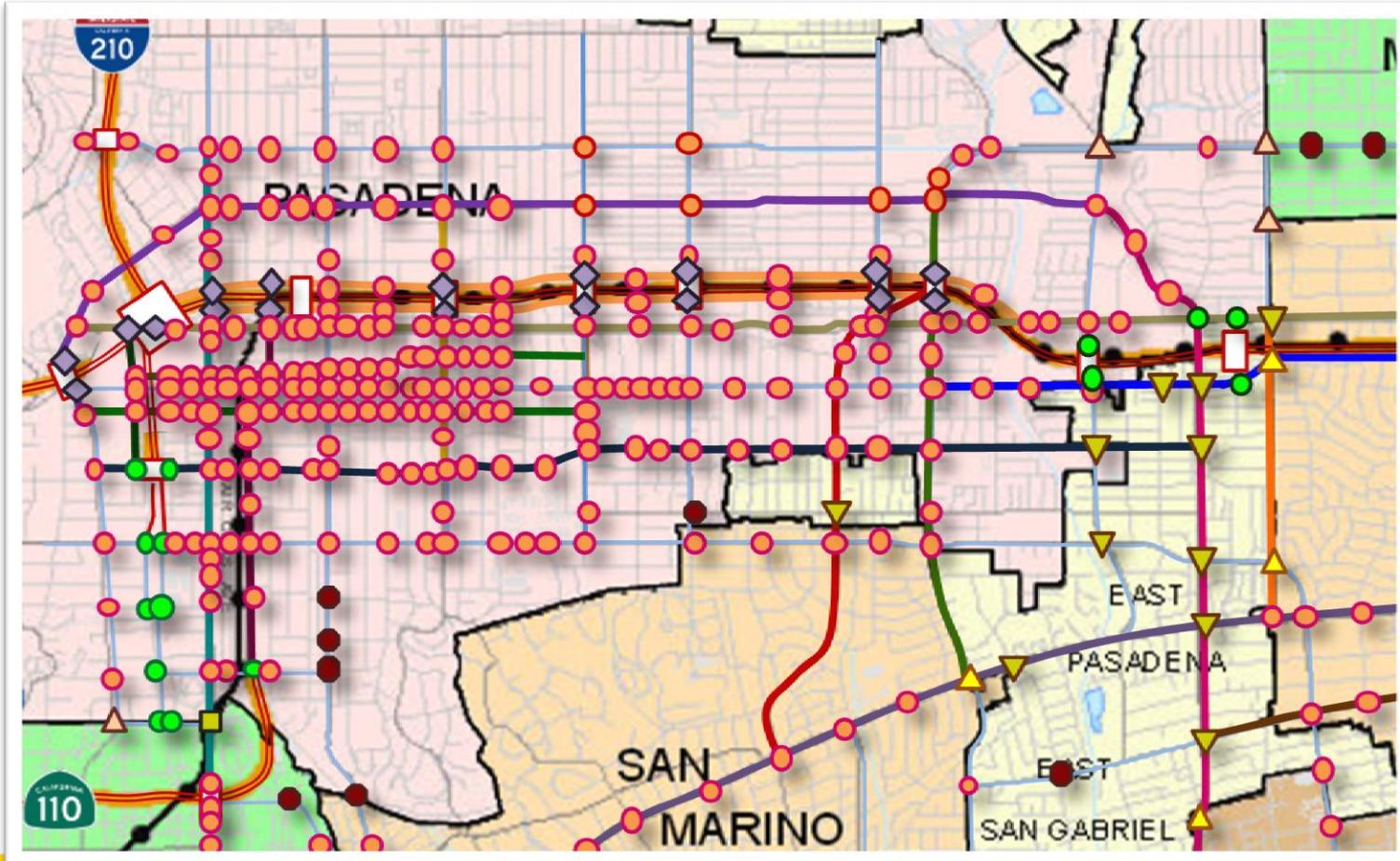


I-210 Pilot Project Goals

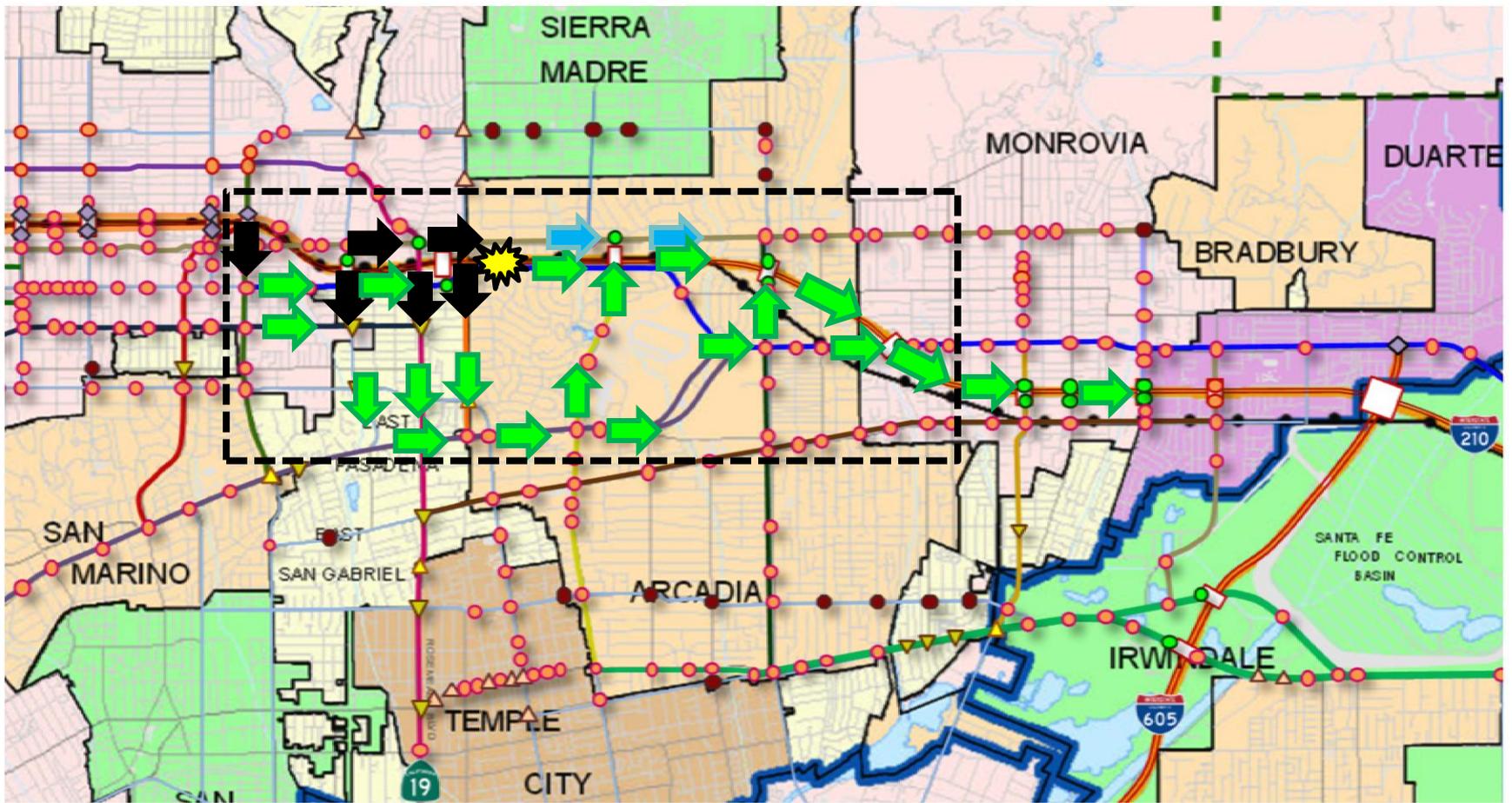
- Bring together corridor stakeholders
- Formulate a roadmap
- Develop and deploy an advanced decision support system
- Develop performance measures
- Demonstrate project effectiveness for potential expansion regionally and statewide



Operational Scenario (Incident Response Example)



Operational Scenario (Incident Response Example)





TM CMF Workshop held in LA

Workshop provided the opportunity for:

- Capability assessment based on:
 - 6 Dimensions
 - Business Processes, Systems & Technology, Performance Measurement, Culture, Organizations & Workforce, and Collaboration
 - 4 Levels of Capability
 - Performed, Managed, Integrated, and Optimized
- Analysis to determine required actions for improvement



TM CMF Workshop held in LA

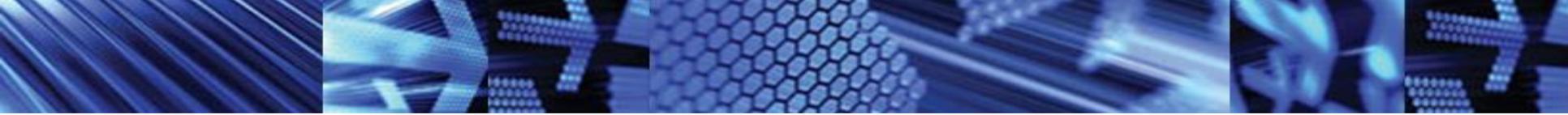
- Region-wide Capability Levels as they relate to the Connected Corridors Project:
 - Performance Measurement (1.67)
 - Organization and Workforce (2.00)
 - Systems and Technology (2.17)
 - Business Processes (2.33)
 - Collaboration (2.67)
 - Culture (2.83)



LA Workshop Outcome

- Sixty-six (66) actions identified
- Action items fell into the nine topic areas:
 - Framework and Tool Development,
 - Systems Engineering Life Cycle and Processes,
 - Planning for Operations,
 - Operational Processes and Procedures,
 - Measuring Performance, Technology Integration,
 - Staffing Resources & Planning,
 - Collaboration among Agencies and Memorandum of Understanding, and
 - Training and Education).
- Actions were agency specific.



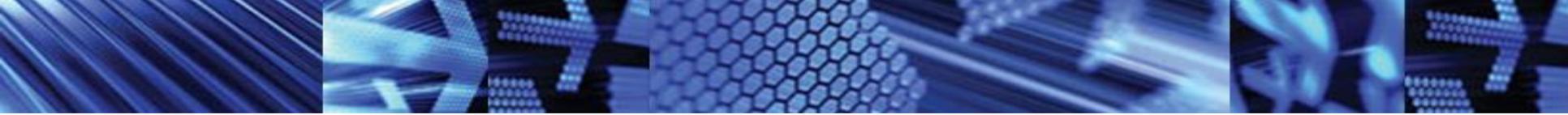


TM CMF Impacts for LA

Action Items Accomplished:

- Systems Engineering Life Cycle & Processes:
 - Conducted multi-agency, multi-discipline concept of operations
 - Working to develop a solid link between the systems engineering process and the regional architecture (RIITS, IEN, ATMS, etc.)
- Planning for Operations:
 - Reviewing possibilities for co-locating Express Lanes/RIITS/511/FSP at LARTMC



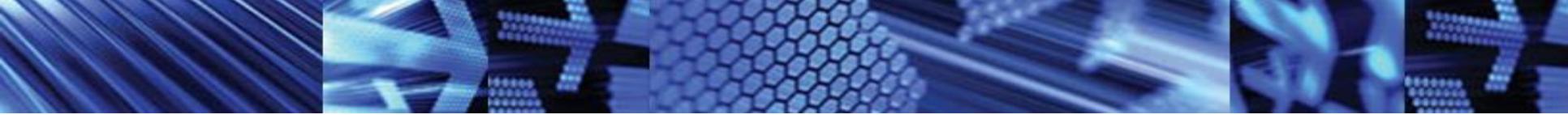


TM CMF Impacts for LA

Action Items Accomplished (continued)

- Operational Processes and Procedures
 - Statewide Performance dashboard
 - Corridor Management based Reorganization in Caltrans District 7
- Measuring Performance
 - Data gaps identified





TM CMF Impacts for LA

Action Items Accomplished (continued)

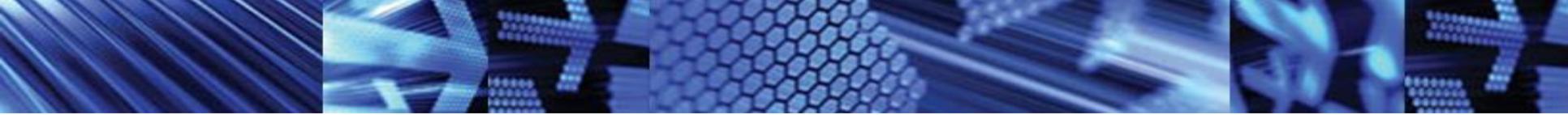
■ Technology Integration

- Established a process (I-Team) within Caltrans Organization to expedite use of emerging technologies
- ATM Assessment Framework on I-105

■ Collaboration Among Agencies and Memorandum of Understanding

- Pursuing formal process to review interagency agreements in CC Pilot and DCCM (ongoing)
- Develop data sharing plan that identify regional gaps in data and potential data sources to meet pre-determined TM objectives.





TM CMF Benefits

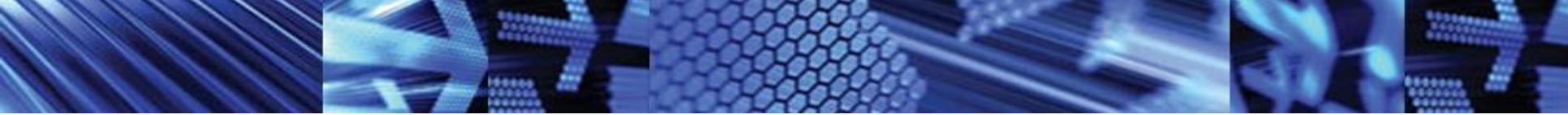
- Self Assessment, a great motivator
- Helped validate Connected Corridors, CM Reorg, and DCCM objectives
- Roadmap focused in organization structure and relationships, process enhancements, and support for mainstream programming



What didn't get done and why?

- Many of action items remain
- Process enhancements and organizational restructuring in process
- TSMO not yet mainstream
- Challenges mainly:
 - Lack of appropriate processes both agency specific and regionally
 - Institutional arrangements that depend on enhanced processes and priorities

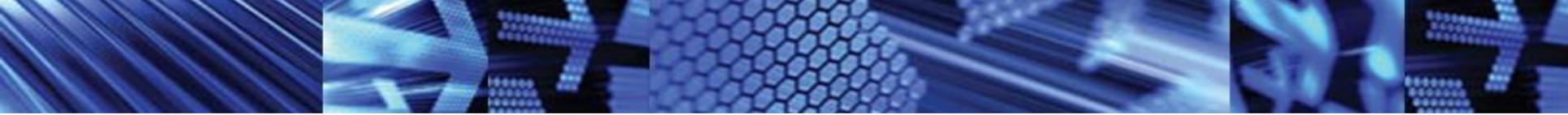




Next Steps to Improved ATDM

- Continue CC Pilot, CM based Reorganization and DCCM
- Caltrans Statewide TSMO Program
- Hold CMF workshops Annually to reassess capabilities and keep progress in check
- Keep the Momentum Going!



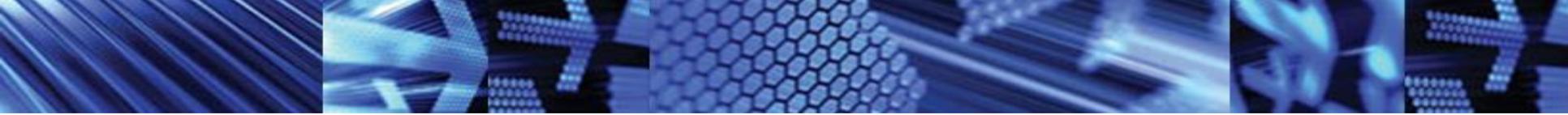


Bob Brydia

Research Scientist, Texas A&M Transportation Institute, Systems Reliability Division

TOPIC 5: UTILIZING THE TM CMF TOOL

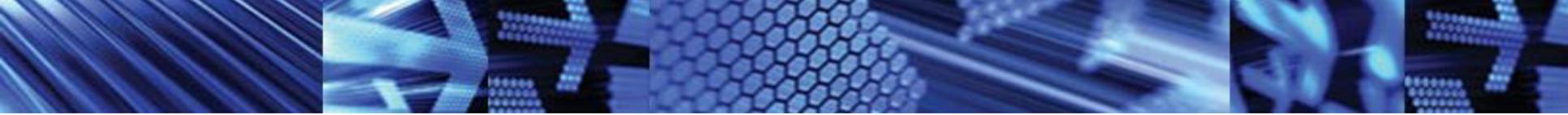




Motivation For The On-Line Tool

- Allows for:
 - Facilitated discussions led by agency
 - Consensus building
 - Prioritization
 - Agency specific action plans
- Consistency
- Homework before the workshops





User Interface

- Simple, not overwhelming
- Works entirely within your own browser
- Addresses each dimension individually
- No database / storage of personal information
- Walk-away with customized output



Tool Home Page

Traffic Management Capability Maturity Framework

Start

Clear

Print Q&A

Actions



**FULL
ASSESSMENT**



**1-MINUTE
ASSESSMENT**



Full Assessment Path

Traffic Management Capability Maturity Framework

Start

Clear

Print Q&A

Actions



BUSINESS PROCESSES

Business processes, in the context of TSM&O, 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 agreements. 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.

How is traffic management planning performed in your agency?

- Project oriented to solve immediate problems on individual facilities or at particular spot location of interest.
- Traffic management planning approached from a corridor perspective.
- Traffic management planning and programming are coordinated at a mostly metropolitan level and tied to regionally agreed-upon operational objectives. Limited statewide or local coordination.
- Traffic management planning processes have links at all planning levels (state, metropolitan, and local) via performance-based operational objectives.
- N/A. (Exempts question from being used in assessing dimension. N/A should only be chosen after a careful consideration that no other response is appropriate.)

Notes

How is the traffic management-related operations and maintenance budget supported at your agency? Note that TSM&O here refers to the activities necessary to keep the traffic management systems and infrastructure functional.

- Constrained. Only covers minimum effort to support reactive traffic management response, such as emergencies or complaints.
- Priority-based. Covers routine, day-to-day traffic operations and maintenance, including some preventative maintenance.
- Covers routine TSM&O and incremental improvement in level of service for selected traffic management strategies. Budgets are based on performance measured mostly using outputs such as system availability.
- Performance- and outcome-based budgeting process to support continuous traffic management operations and maintenance. Budgets based on expected performance outcomes and ability to provide adequate traffic management response capability.
- N/A. (Exempts question from being used in assessing dimension. N/A should only be chosen after a careful consideration that no other response is appropriate.)

Notes



1-Minute Evaluation Path

Traffic Management Capability Maturity Framework

Start

Clear

Print Q&A

Actions

Dimension	Level 1 - Level 2	Level 2 - Level 3	Level 3 - Level 4	Level 4
 <p>BUSINESS PROCESSES</p>	<p>Traffic management development and deployment processes are agency specific and ad hoc.</p>	<p>Agencies implement a nominally systematic approach to traffic management to address immediate concerns. Traffic management approaches are operator driven and either static or based on time of day.</p>	<p>Traffic management development and deployment processes are standardized and have a more system-wide approach that is well documented.</p>	<p>Development and deployment processes related to traffic management are streamlined across an entire region, and agencies have a continuous improvement process for traffic management.</p>
 <p>SYSTEMS AND TECHNOLOGY</p>	<p>Traffic management approaches are developed on an ad hoc basis independent of the systems engineering process.</p>	<p>The systems engineering process and ITS architecture are consistently applied within the traffic management context. Agencies apply advancements and technologies in spot locations.</p>	<p>Agencies apply advanced technologies but with a limited level of automation. Traffic management systems are replicated and integrated within operations, with standardized documentation.</p>	<p>Automation of traffic management processes is based on historical, current, and predicted data. New and emerging technologies are deployed on a continuous basis to improve system efficiency.</p>
	<p>Use of performance measurement processes for traffic management is not undertaken on a regular basis.</p>	<p>Agencies employ performance measurement assessment of traffic management strategies primarily to analyze impacts post deployment.</p>	<p>Agencies identify desired outcome measures and consistently utilize performance measure analyses to improve strategy deployment and overall operations.</p>	<p>Agency traffic management goals and objectives are mapped to performance measures, which are regularly used to manage systems. Documentation of analyses results are distributed internally and externally and are archived for later use.</p>



Results Matrix

Traffic Management Capability Maturity Framework

Start

Clear

Print Q&A

Actions

Dimension	% score	Level 1 - Level 2	Level 2 - Level 3	Level 3 - Level 4	Level 4
 <p>BUSINESS PROCESSES</p>	50 (10/20)	Traffic management development and deployment processes are agency specific and ad hoc.	<p>Choose Actions</p> <p>Agencies implement a nominally systematic approach to traffic management to address immediate concerns. Traffic management approaches are operator driven and either static or based on time of day.</p>	Traffic management development and deployment processes are standardized and have a more system-wide approach that is well documented.	Development and deployment processes related to traffic management are streamlined across an entire region, and agencies have a continuous improvement process for traffic management.
 <p>SYSTEMS AND TECHNOLOGY</p>	42 (5/12)	Traffic management approaches are developed on an ad hoc basis independent of the systems engineering process.	<p>Choose Actions</p> <p>The systems engineering process and ITS architecture are consistently applied within the traffic management context. Agencies apply advancements and technologies in spot locations.</p>	Agencies apply advanced technologies but with a limited level of automation. Traffic management systems are replicated and integrated within operations, with standardized documentation.	Automation of traffic management processes is based on historical, current, and predicted data. New and emerging technologies are deployed on a continuous basis to improve system efficiency.
 <p>PERFORMANCE MEASUREMENT</p>	67 (8/12)	Use of performance measurement processes for traffic management is not undertaken on a regular basis.	Agencies employ performance measurement assessment of traffic management strategies primarily to analyze impacts post deployment.	<p>Choose Actions</p> <p>Agencies identify desired outcome measures and consistently utilize performance measure analyses to improve strategy deployment and overall operations.</p>	Agency traffic management goals and objectives are mapped to performance measures, which are regularly used to manage systems. Documentation of analyses results are distributed internally and externally and are archived for later use.



Self-Selection of Actions Dialogue

Traffic Management Capability Maturity Framework

Start

Clear

Print Q&A

Actions

Assessed:

Level 3

Viewing:

Level 3 to Level 4



All Actions All Levels



My Selected Actions

Pull desired actions from the left box to the right box



BUSINESS PROCESSES



SYSTEMS AND TECHNOLOGY



PERFORMANCE MEASUREMENT



Available Actions

Define the scope of the system and develop a working definition of system-wide performance measures. Consider both corridor level and system wide measures related to f to ii

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Routinely use performance measures to evaluate new transportation investment projects and changes to existing projects.

Ensure performance measures are utilized across modes/jurisdictions and incorporated into regional/local transportation investment planning.

Develop a life-cycle cost analysis procedure to assess the benefits of operations.

Develop and implement a system that automatically utilizes both real-time and historical data to provide predictive capabilities to support traffic management operations.

Utilize advanced simulation and analytical model to support the analysis of traffic management strategies/options.

Develop a workshop for agency-wide staff on values of performance measures and how to incorporate them into operational decisions.

My Selected Actions



All Actions All Levels



My Selected Actions

of actions required

ss levels you were assessed to other levels



Self-Selection of Actions Dialogue

Traffic Management Capability Maturity Framework

Start

Clear

Print Q&A

Actions

Assessed:

Level 3

Viewing:

Level 3 to Level 4



All Actions All Levels



My Selected Actions

Print desired actions from the left box to the right box

Pull actions from available to selected



BUSINESS PROCESSES



SYSTEMS AND TECHNOLOGY



PERFORMANCE MEASUREMENT

Available Actions

- Develop outreach program to report measured performance.
- Extend the outcome measurement program to support broader goals of the system operation (e.g., air quality, origin-destination travel time).
- Establish operations data system for producing performance measures on a continual and automated basis.
- Develop data quality assurance program as part of routine archiving process.
- Routinely use performance measures to evaluate new transportation investment projects and changes to existing projects.
- Ensure performance measures are utilized across modes/jurisdictions and incorporated into regional/local transportation investment planning.
- Develop a life-cycle cost analysis procedure to assess the benefits of operations.
- Develop and implement a system that automatically utilizes both real-time and historical data to provide predictive capabilities to support traffic management operations.
- Utilize advanced simulation and analytical model to support the analysis of traffic management strategies/options.
- Develop a workshop for agency-wide staff on values of performance measures and how to incorporate them into operational decisions.
- Develop formal policy and action plan that tie performance measures to all aspects of system operations and maintenance.

My Selected Actions

- Define the scope of the system and develop a working definition of system-wide performance measures. Consider both corridor-level and system-wide measures related to full range of measures (mobility, safety, livability, sustainability). Extend the measures to include full range of output and customer satisfaction measures.
- Consider additional output and outcome measures to meet the needs of real-time operations as well as archiving protocols.
- Design and implement an archived data management system that automatically retrieves and archives data from multiple sources. Develop an interface that allows the agency to share the data with partner agencies via standardized data communication protocols.



Self-Selection of Actions Dialogue

Traffic Management Capability Maturity Framework

Start

Clear

Print Q&A

Actions

Assessed:

Level 3

Viewing:

Level 2 to Level 3
Level 1 to Level 2
Level 2 to Level 3
Level 3 to Level 4

All Actions All Levels

My Selected Actions



BUSINESS PROCESSES



SYSTEMS AND TECHNOLOGY



PERFORMANCE MEASUREMENT

Available Actions

- Identify target corridors, including possible nearby arenas (where the impacts of traffic management are expected) to be included in performance measurement.
- Develop a working definition for performance and travel time reliability measures (e.g., temporal and spatial requirements for data aggregation and reporting).
- Develop strategies to produce useful output/outcome and reliability performance measures for internal and external purposes on a corridor-level basis.
- Establish data acquisition plan and system for acquiring data to support traffic management needs using both direct measurement (e.g., volumes) and analytic methods (e.g., queues, delays).
- Identify opportunities for acquiring data from external sources such as other partner agencies and the private sector and establish data-sharing agreements.
- Develop procedures to standardize data from various sources and improve the data management system to support multiple data sources.
- Develop consistent performance data analysis process to continually track the performance of the system in relation to the established targets and benchmarks.
- Develop process to incorporate operations performance into decision-making process for transportation-related investment.
- Establish program for routine reporting of performance for both internal use and external use and for public/decision-maker outreach.
- Develop a software system for automated processing and visualization of real-time and historical data analytics.
- Develop agency policy that ties performance measures to operational objectives.
- Create action plan to utilize performance measures for managing the system to achieve target performance.

Pull desired actions from the left box to the right box

My Selected Actions

- Define the scope of the system and develop a working definition of system-wide performance measures. Consider both corridor-level and system-wide measures related to full range of measures (mobility, safety, livability, sustainability). Extend the measures to include full range of output and customer satisfaction measures.
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- Design and implement an archived data management system that automatically retrieves and archives data from multiple sources. Develop an interface that allows the agency to share the data with partner agencies via standardized data communication protocols.

Change levels to see different actions. Keeps all your currently selected actions!



Federal Highway Administration
Office of Operations – Transportation Management

Comparison of Output

Traffic Management Capability Maturity Model

Performance Measurement - Level 3 to level 4

WHY 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.

IMPROVEMENT TARGET

FROM:	Agencies identify desired outcome measures and consistently utilize performance measure analyses to improve strategy deployment and overall operations.
TO:	Agency traffic management goals and objectives are mapped to performance measures, which are regularly used to manage systems. Documentation of analyses results is distributed internally and externally and is archived for later use.

KEY SUB-DIMENSIONS

- Measures Definition
- Data Acquisition

MEASURES DEFINITION (LEVEL 3 TO LEVEL 4)

Sub-Dimension Summary

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.

Key Actions

1. Define the scope of the system and develop a working definition of system-wide performance measures. Consider both corridor-level and system-wide measures related to full range of measures (mobility, safety, livability, sustainability). Extend the measures to include full range of output and customer satisfaction measures.
2. Consider additional output and outcome measures to meet the needs of real-time operations as well as archiving protocols.

Traffic Management Capability Maturity Model

v1.0

Performance Measurement Guidance - Level 3 to Level 4

WHY IS PERFORMANCE MEASUREMENT IMPORTANT?

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.

IMPROVEMENT TARGET

FROM:	Agencies identify desired outcome measures and consistently utilize performance measure analyses to improve strategy deployment and overall operations.
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KEY SUB-DIMENSIONS

- [Measures Definition](#)
- [Data Acquisition](#)
- [Performance Management](#)

MEASURES DEFINITION ACTION PLAN (LEVEL 3 TO LEVEL 4)

Sub-Dimension Summary:

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.

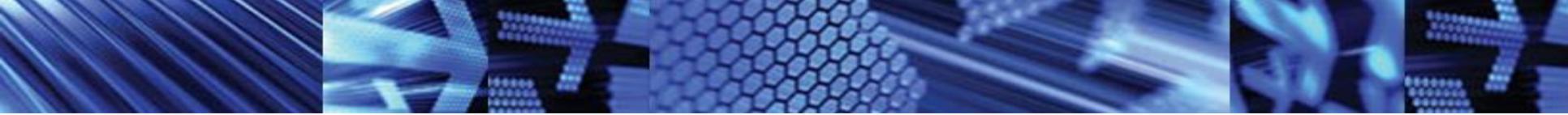
Key Actions:

1. Define the scope of the system and develop a working definition of system-wide performance measures. Consider both corridor-level and system-wide measures related to full range of measures (mobility, safety, livability, sustainability). Extend the measures to include full range of output and customer satisfaction measures.
2. Develop outreach program to report measured performance.

Selected Actions

Full Action Set

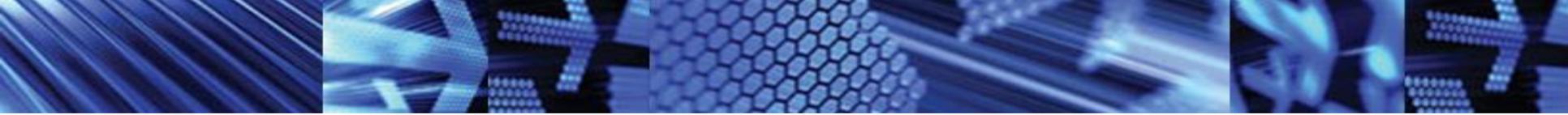




Tool Status

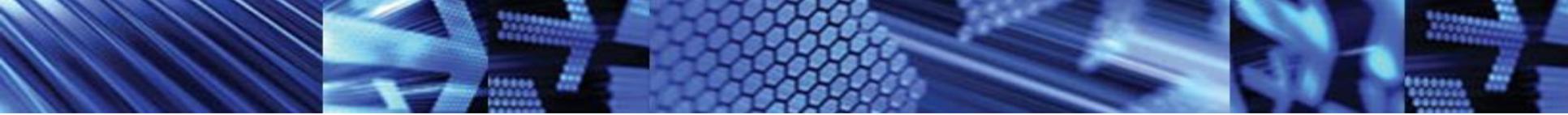
- Tool in final stages of testing and approval
- Will be incorporated into FHWA office of Operations web site
- Template for additional CMFs
- Limitations:
 - Does not store your information
 - Does not address resources / scheduling of actions





NEXT STEPS AND CONCLUDING DISCUSSION





Housing and Maintaining the CMF Tools

- Intent is to make TM and other business process CMF tools available from FHWA Operations website
 - Working on approvals from IT Investment Review
 - Modest updates anticipated periodically
- Long term alternatives will be evaluated (e.g. NOCoE)



Question and Answer Session



Points of Contact



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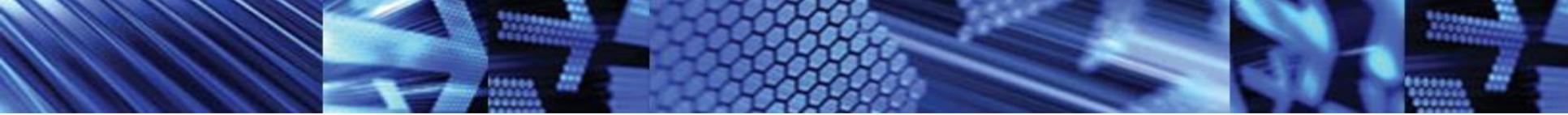


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Thanks for joining us!

- We hope to see you at our next ATDM Webinar in March!

