

**Transportation Systems
Management & Operations (TSM&O):
A Capability Improvement Workshop**

TSM&O

An integrated program to optimize the performance of existing roadway infrastructure through the implementation of specific systems and services that preserve capacity, improve reliability and safety, and improve the environment.

Transportation Systems Management and Operations

Challenge

- Congestion and unreliability increasing with economy and population growth
- Major capacity limits: costs and impacts, timing & scale
- Reduce emissions and energy impacts

Opportunity

- Unexploited potential of aggressive TSM&O applied to existing roadways – to improve mobility (multimodal), safety, and environment
- Short-run, low cost potential

Approach

- Key barriers not \$\$ or technology – rather: policy, process and institutional arrangements

Portland

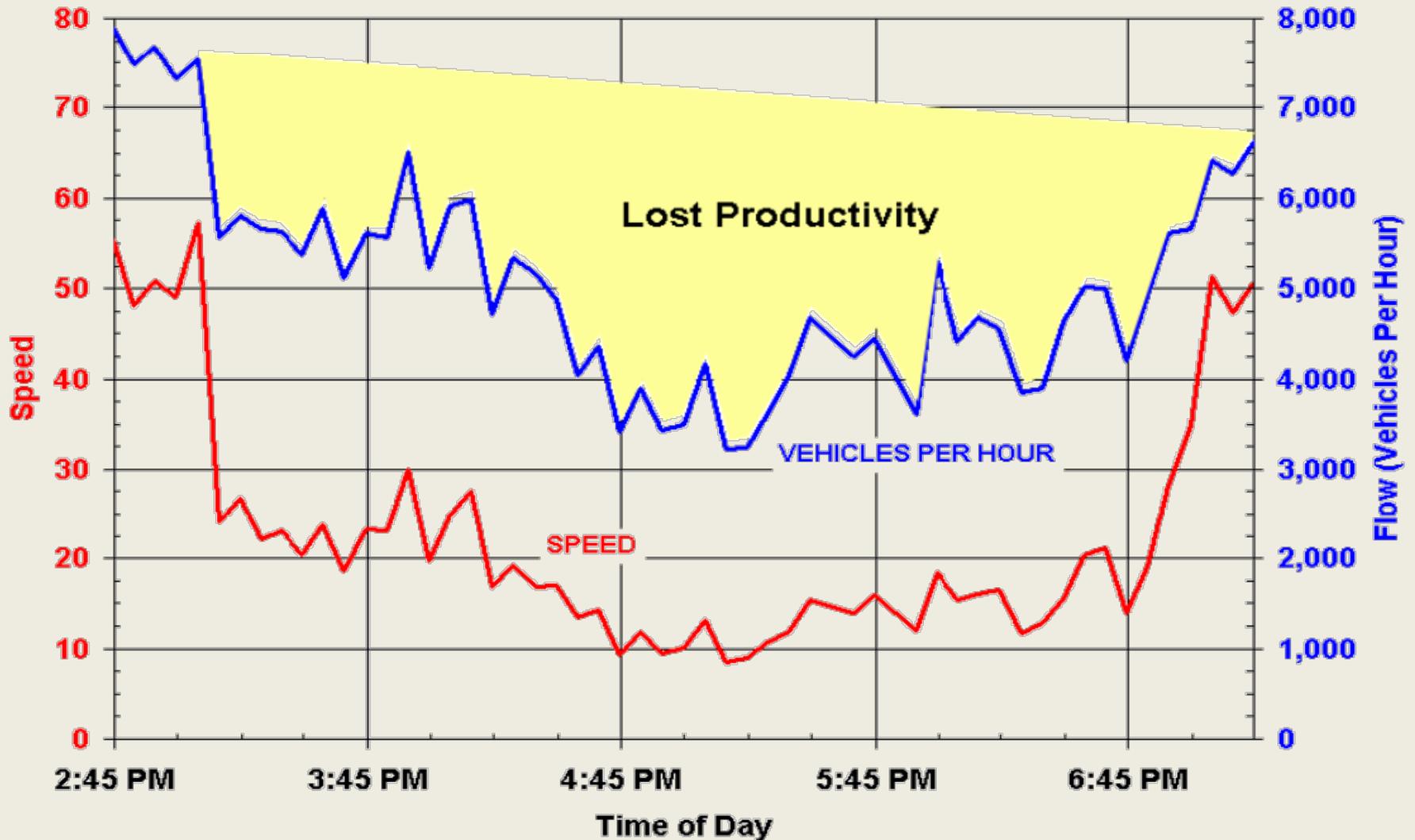
- Livability and sustainability leader
- Strong transit / bike/ped / land use planning reputation
- Committed to making best use of modes and existing roadway networks (freeway and arterial)
- Portland has strong base to build on
- What are next steps – to improve effectiveness (on a continuing basis)?

Congestion Increasing Again (Portland)

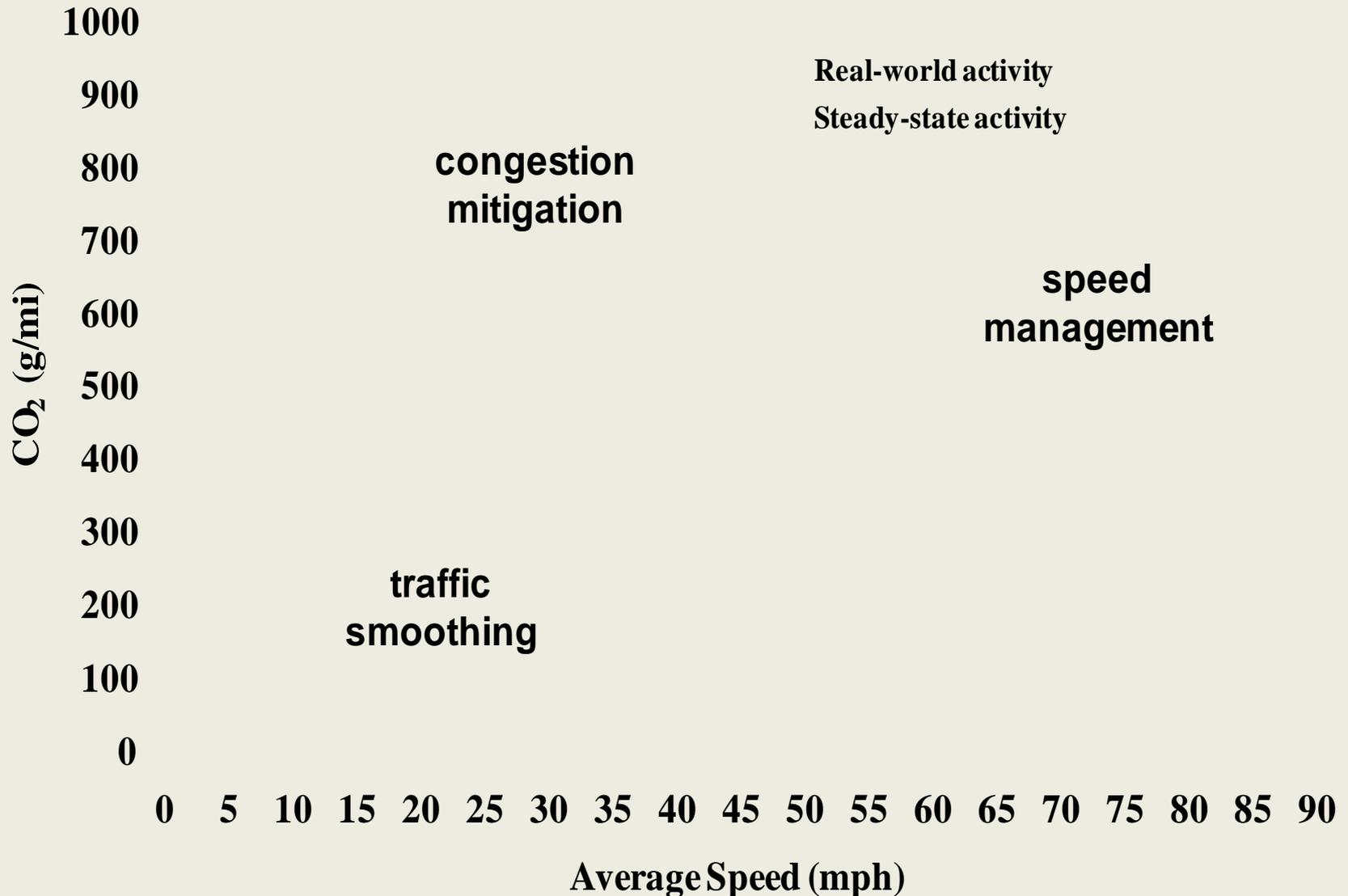
System Performance	2010	2008
Congested Travel (% of peak VMT)	68	65
Congested System (% of lane-miles)	50	48
Total Fuel Consumed (1000 gallons)	10,931	9,868
Total Delay (1000s of person-hours)	41,743	40,172
Total Cost (\$ millions)	850	803

Note impact of projected future increasing population/vehicles

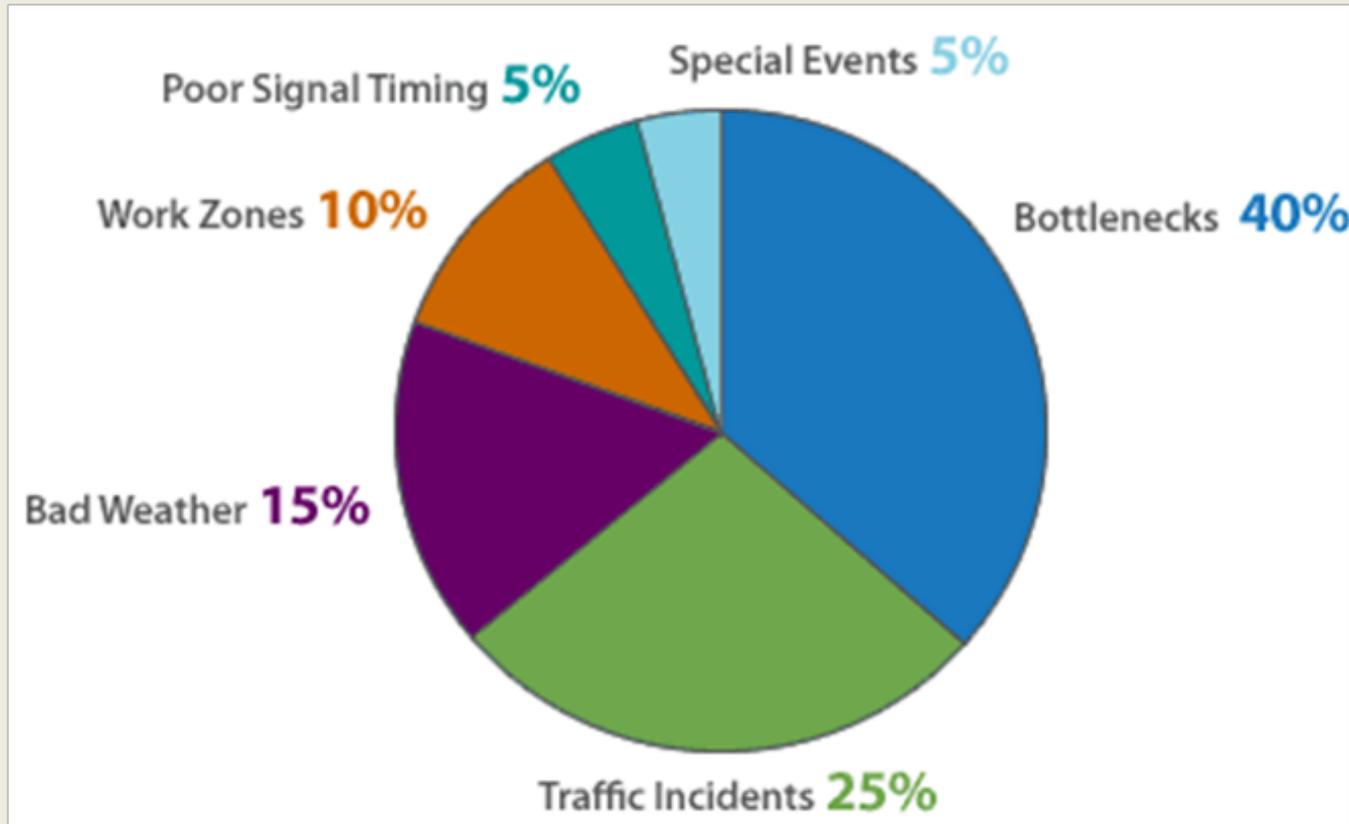
Unmanaged Traffic Impacts with Limited Capacity Options



TSM&O Strategies and GHG Reductions



Increasing Knowledge about Causes of Congestion



Majority of delay/most unreliability due to “non-recurring” events NOT addressed by new capacity

Wide Range of Strategies to Match Causes of Congestion

Conventional Strategies

- Emergency/Incident Management
- Freeway Management
- Special Event Management
- Work Zone Management
- Travel Weather Management
- Traveler Information

Newer Strategies

- Traffic Responsive Signalization/Prioritization
- Transit/Bike-Ped Signal Prioritization
- Integrated Freeway/arterial corridor Management
- Active (Freeway) Traffic Management
- Improved Information for Demand Management
- Eco-Driving
- Pricing

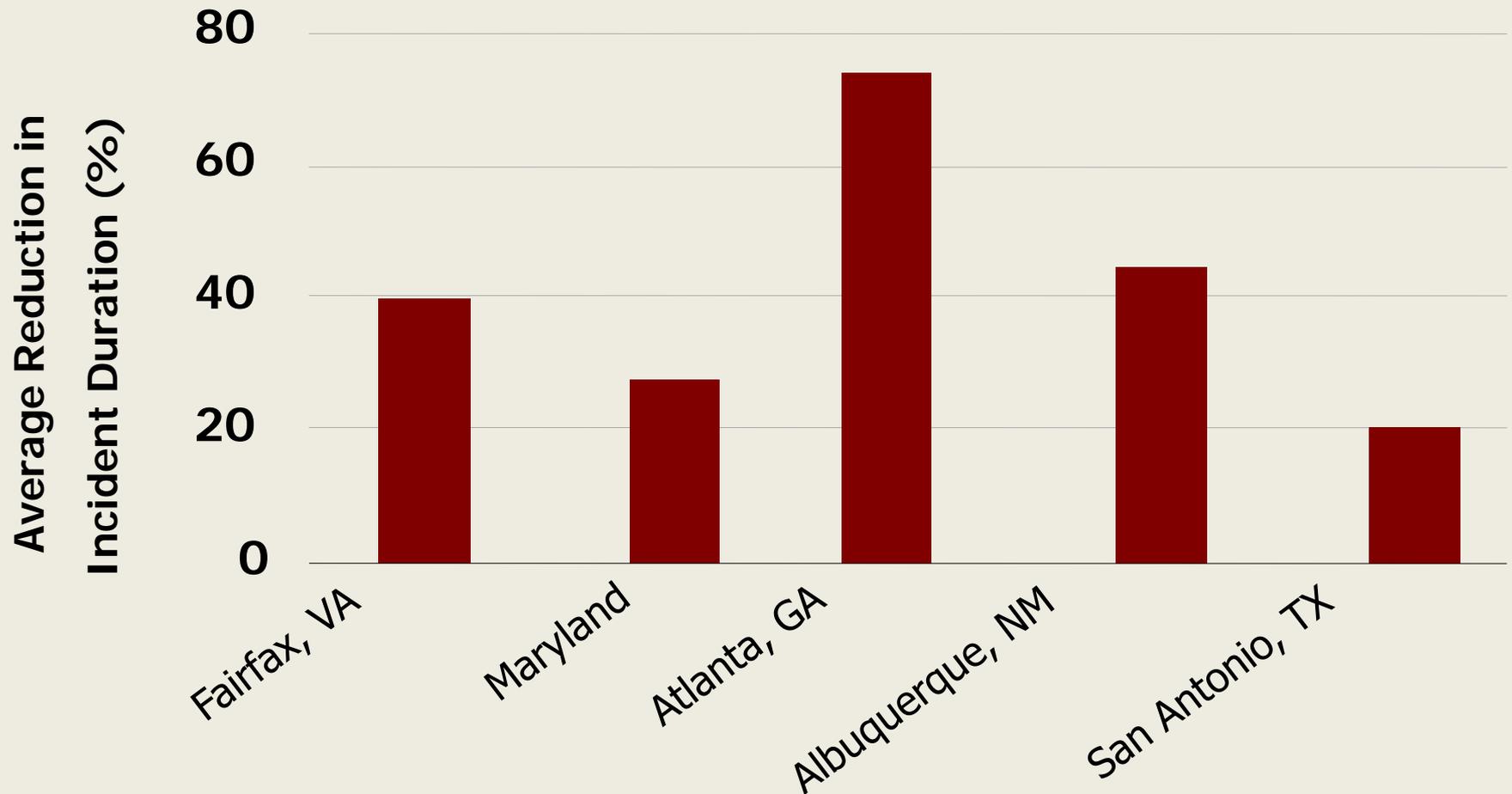
Unexploited Transportation Service Potential?

TSM&O Strategies	Potential Delay Reduction (plus improved reliability)
Flow control/ramp metering	7-8%
Traffic responsive signals	10-12%
Incident management	10-15%
Work zone traffic management	3-4%
Weather information	2-3%
Traveler information	1-2%
Active Traffic Management	15%
Pricing	20%

How can transportation agencies capitalize on the potential of TSM&O best practice – and beyond?

But we're doing it.....

Substantial Difference between Average and Best Practice



Widely Varying State of the Practice

QUICK CLEARANCE AND RECOVERY STRATEGIES	Abandoned Vehicle Hazards	Lengthy Minor Incident Clearance	Lengthy Major Incident Clearance	Liability Concerns	EXAMPLE APPLICATIONS
Abandoned Vehicle Legislation/Policy	●				21+ U.S. Metropolitan Areas, IN, NC
Safe, Quick Clearance Laws— <i>Driver Removal</i>		●			~25 States, including FL, GA, MD, NC, OH, SC, TN, TX, VA, WI
Service Patrols		●			130+ U.S. Metropolitan Areas, AZ (Phoenix), CA, FL, GA (Atlanta), IN, MD, MN, NM (Albuquerque), OR, TN, UT (Salt Lake City)
Vehicle-Mounted Push Bumpers		●			CA (Redding, Stockton), MD (Baltimore), NJ/PA (Delaware Valley Region), OH (Cincinnati), TN (Chattanooga), TX (Austin), UT (Salt Lake City)
Incident Investigation Sites		●			16+ U.S. Metropolitan Areas, TX (Houston)
Safe, Quick Clearance Laws— <i>Authority Removal</i>		●	●	●	AZ, CA, CO, FL, GA, IL, IN, KY, MO, NM, NC, OH, OR, SC, TN, TX, VA, WA
Quick Clearance/Open Roads Policy		●	●		35+ U.S. Metropolitan Areas, CA, FL, GA, ID, IN, LA, MD, NV, NH, TN, UT, WA, WI
Non-cargo Vehicle Fluid Discharge Policy		●	●		FL, MN
Fatality Certification/Removal Policy			●		PA, TN, TX (Austin), WA
Expedited Crash Investigation			●		93+ U.S. Metropolitan Areas, FL, IN, TX (North Central Region), UT
Quick Clearance Using Fire Apparatus			●		TX (Austin)
Towing and Recovery Quick Clearance Incentives			●		FL, GA, WA
Major Incident Response Teams			●		DE, FL, IL (Chicago), LA, MD, NJ, OH (Cincinnati, Columbus), NY, TX (Dallas Co.), WA

Key Differentiators (Effective TSM&O)

- Regions, states at very different levels of effective utilization of TSM&O
- National research (TRB, AASHTO, FHWA): the most effective TSM&O requires specific business processes & institutional structures
- No area is the best at everything – research indentified key dimensions and levels of capability for improving capabilities

Further Capability Improvements

Objective – “mainstreaming” continuous improvement

Key differentiators – not projects, but improvements in processes and arrangements that support continuous improvement – “*institutionalize*”

Workshop process – helps regions evaluate and improve key capabilities from any starting point

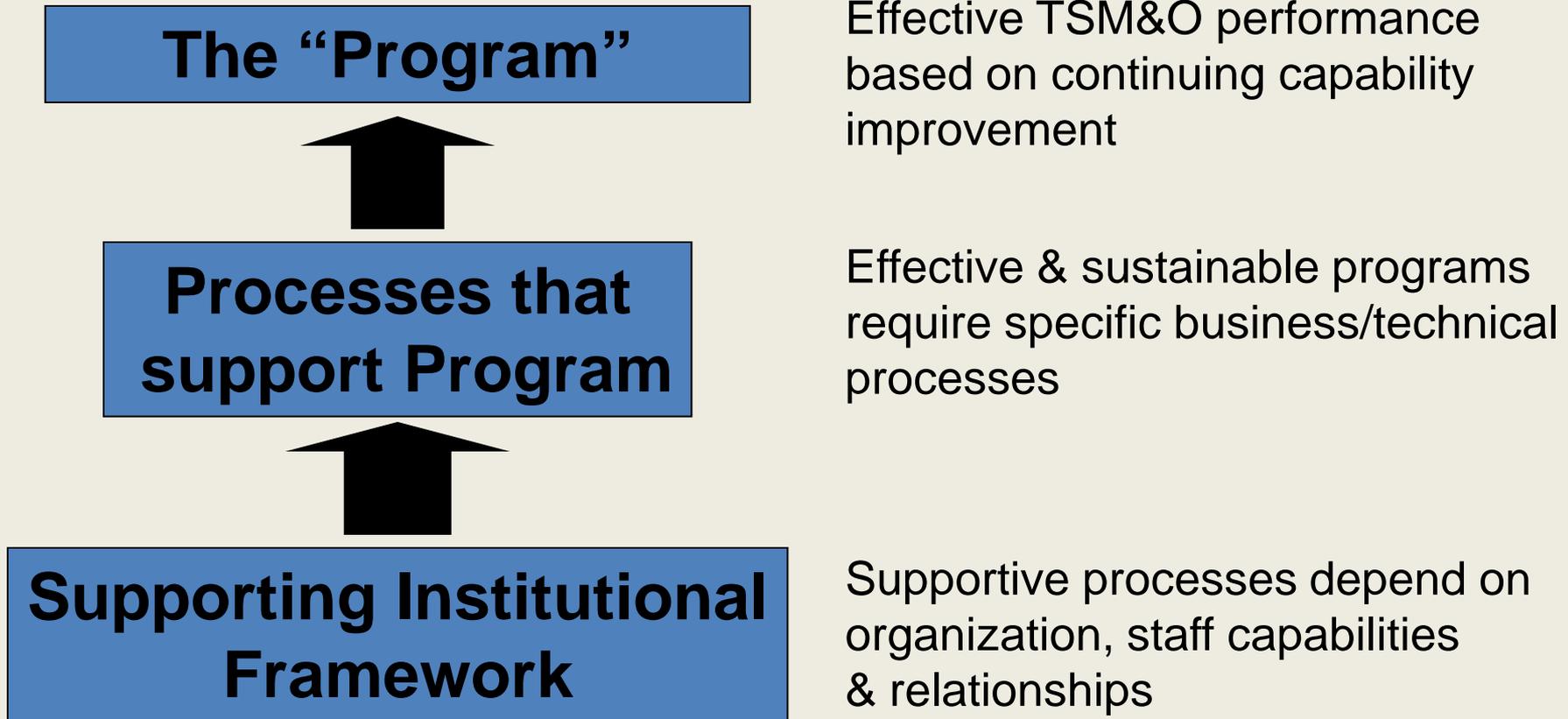
13 FHWA-sponsored state DOT and regional workshops nationwide

Creating an Effective Program to Advance Transportation System Management and Operations



Primer

Key Finding: More Effective Program Characteristics



Beyond ITS “Projects”: Keys to Successful Implementation

- Key business and technical processes for effective (routine) implementation are essential to increased impact
- Formal organizational structure and collaborative relations are also key

Example: Incident Management

Combination of:

- ITS infrastructure
- Management Center with multi-jurisdictional participation
- Integrated communications
- Pre-defined procedures and protocols
- Close transportation/PSA cooperation and co-training
- Private sector participation & incentives
- Performance measurement
- After-action analysis

Key Preconditions to Effectiveness (focus of self-evaluation)

1. ***Planning/Program*** – formal, regional, multi-year, integrated, sustainable resources
2. ***Systems & Technology*** – consistent, area-wide, standardized, documented
3. ***Performance Measurement*** – Outcome measures, data, analytics, dashboards, and actually *used* to improve procedures
4. ***Culture*** – top management support/formal commitment
5. ***Organization*** – clear roles, accountability, core capacities
6. ***Collaboration*** – formal relationships – transportation (regional/local) and public safety/private

Capability Levels (for each dimension)

Goal for the Future

Where does the region stand
For each dimension?

Most Agencies Today

LEVEL 4

Optimized

- Performance-based improvement
- Formal program
- Formal partnerships

LEVEL 3

Integrated

- Process documented
- Performance measured
- Organization/
partners aligned
- Program budgeted

LEVEL 2

Managed

- Processes developing
- Staff training
- Limited accountability

LEVEL 1

Performed

- Activities &
relationships ad hoc
- Champion-driven

Capability Level Self Evaluation Structure

DIMENSIONS	LEVEL 1 PERFORMED	LEVEL 2 MANAGED	LEVEL 3 INTEGRATED	LEVEL 4 OPTIMIZING
Planning & Programming		X		
Systems & Technology			X	
Performance Measurement	X			
Culture			X	
Organization/ staffing		X		
Collaboration			X	

Lowest level is constraint

How the Capability Improvement Workshops Work

Objective:

Given the current state of play – how to get better?

Approach:

A structured dialogue among key participants that focuses on the most effective process and institutional changes that will serve as the basis for continuing improvement

Criteria that Define Levels of Capability (2 of 6 dimensions shown)

CAPABILITY LEVEL DEFINITIONS FOR SELF-EVALUATION OF CURRENT STATE OF PLAY IN THE REGION

DIMENSIONS	LEVEL 1 PERFORMED	LEVEL 2 MANAGED	LEVEL 3 INTEGRATED	LEVEL 4 OPTIMIZING
Business Processes	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 a formal continuing planning processes
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

How the Capability Improvement Workshops Work

“The Answers are in the Room”

1. Participants identify regional state of play – consensus on strengths and weaknesses
2. Participants identify current level of capability (criteria)
3. Participants identify actions to get to next level
4. Participants' follow up – convert structured action list to plan for achievement and secure commitment

Agenda

Session	Time	Topic	Who
E	8:00 – 8:30	Welcome	Lockwood
	8:30 - 9:30	Executive Session – Background	
	9:30 – 9:40	Move to Room 370 AB	
1	9:45 – 10:00	Welcome and Introductions	FHWA Metro
2	10:00 – 12:00	“The Answer Is In The Room” – Participants’ self-evaluation of current strengths and weaknesses	Participants (facilitated by Euler and Lockwood)
	12:00 - 12:45	Lunch (provided by Metro)	
3	12:45 – 2:15	Capability improvement: participants’ identification of current levels and strategies to get to next level – for dimensions 1-3	Participants (facilitated by Euler and Lockwood)
	2:15 – 2:30	Break	
4	2:30 - 3:45	Continued – for dimensions 4-6	Participants (facilitated by Euler and Lockwood)
5	3:45 - 4:30	Summary and next steps (action items)	Lockwood and participants