

Transportation System Management & Operations TSM&O

National Overview



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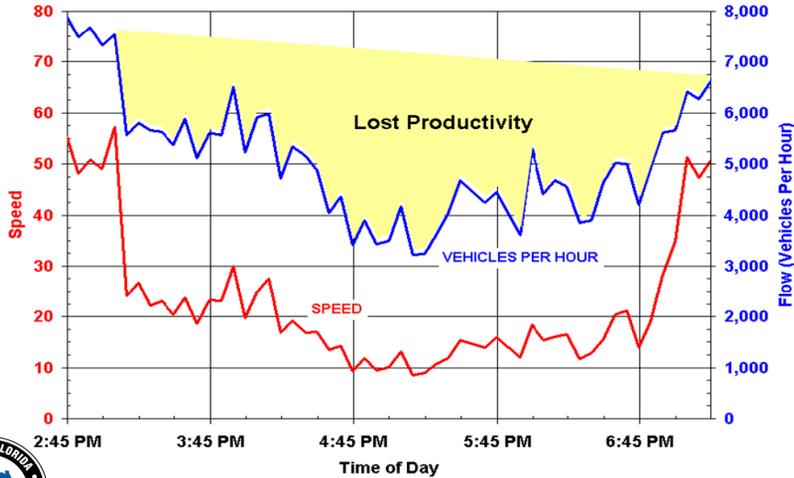
National Congestion

- 4.8 Billion Hours of Extra Time in Urban Areas Nationally
- \$101 Billion Cost of Extra Time and Fuel in Urban Areas
- Commuter Cost of \$713 Compared to \$301 in 1982
- Peak Period Delay for Average Commuter was 34 Hours from 14 in 1982

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Unmanaged Traffic: Major Capacity Losses & Delays

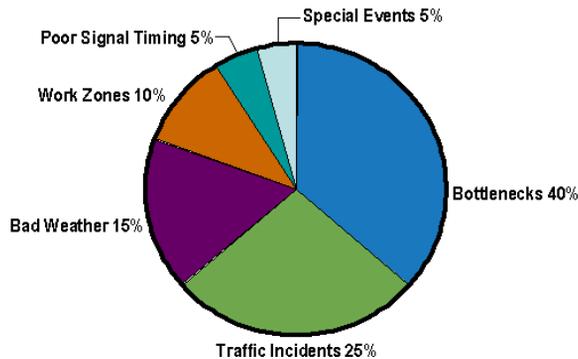


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Better Understanding Causes of Delay

- “Non-Recurring Congestion” (Crash, Weather, Construction, etc.) Causes More Delay than Capacity Shortfalls
- Compare the Seven Causes of Delay/Disruption



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System Management and Operations

“Maximizing the level of service from the existing system, anticipating/responding to service disruptions”

- Note: Some Terminology Confusion:
 - TSM&O,” “SO&M,” “Systems Operations,” ITS, “Congestion Management,” etc.



NATIONAL PICTURE



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

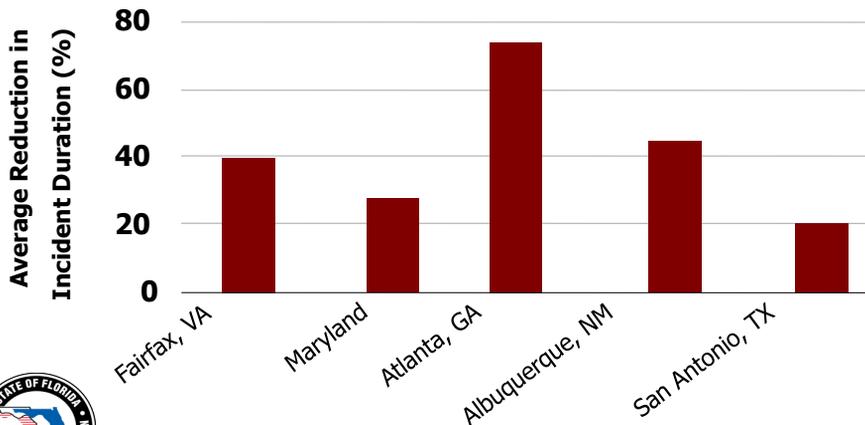
- Traffic Responsive Signalization
- Demand Management
- Integrated Corridor Management
- Active (Freeway) Traffic Management



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“But we’re doing it”?But Big Differences in Similar Regions



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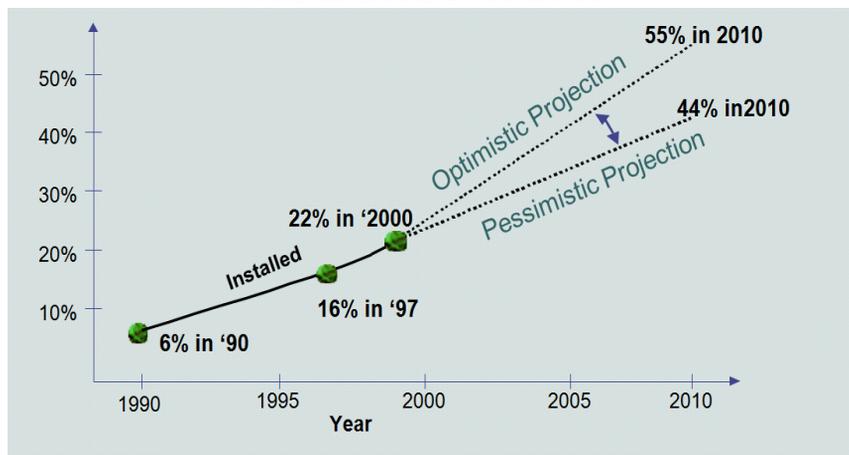
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Unexploited Potential: Impact of Best Practice

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/Managed Lanes	15%
Pricing	20%



Infrastructure Deployment: National Trend



NATIONAL BEST PRACTICE



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Example National Best Practice: Incident Response Strategies

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

Example National Best Practice: Performance Measurement Strategies

PERFORMANCE MEASUREMENT STRATEGIES	Inconsistent Definitions	Lack of Consensus/ Data	Limited Data Sharing/ Accessibility	EXAMPLE APPLICATIONS
National Performance Measurement Guidance	●	●		TIM Focus State Initiative (FSI), TIM Performance Measurement Knowledge Management System/Listserv
Annual TIM Self-Assessment		●		75+ U.S. Metropolitan Areas
Strong Funding and Performance Link		●		MD, WA
Multi-agency Data Exchange Protocol		●	●	CA (San Diego), CO (El Paso/Teller Co.), NV (Clark Co.), TX (Ft. Worth), UT, WA

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Example National Best Practice: Incorporation of TSM&O into Planning

Traditional Planning Process

- ✓ Elected/appointed officials
- ✓ Collective regional plan development
- ✓ Long-term planning focus
- ✓ Near-term project funding
- ✓ Projects of local and regional significance
- ✓ Historical trends

Planning Influenced by TSM&O

- ✓ "Operations thinking" influences vision
- ✓ Decisions engage operations managers
- ✓ Operations/capital mix optimized
- ✓ Performance measures reflect objectives
- ✓ Regional performance informs

Improving regional transportation system performance 



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NATIONAL RESEARCH

How to Improve the Capability for Effective TSM&O



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Findings of National Study of “Leading” vs. “Average” Practice

- Less Effective Programs
 - *Not primarily an investment issue* (\$ typically 2%+)
- **Problem:** TSM&O ad hoc
 - Lacks mainstreaming as formal “*core program*” status (plan, budget, accountability, organization, staffing, relationships)



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Nationwide Survey of Best Practice: Process and Organization Key

The “Program”



Processes that
Support Program



Supporting Institutional
Framework

- What are the Characteristics of an Effective Program?
- What Business and Technical Processes are Needed?
- What Kind of Organization and Relationships Support the Processes?



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Dimensions of Improved Capability

1. **Planning/Program** – Formal, Multi-year, Integrated
2. **Systems & Technology** – Consistent and Standardized
3. **Performance** – Actually Used to Improve Procedures/ Protocols
4. **Culture** – Top Management Support/Regional Accountability
5. **Organization** – HQ Support, Program Status
6. **Collaboration** – Formal Relationships and Business Arrangements

Is this any different than other DOT programs?



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What it Takes:

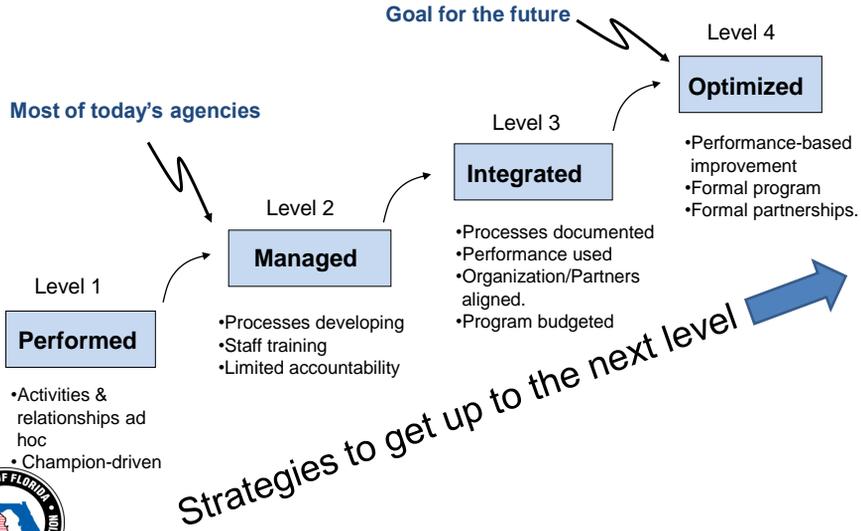
TSM&O Mainstreamed as a Top-level Formal Program



A Few States Have Fully Mainstreamed Operations as a Formal Top-level DOT Strategy



Evaluating the Agency's Current State-of-Play (Self-Evaluation)

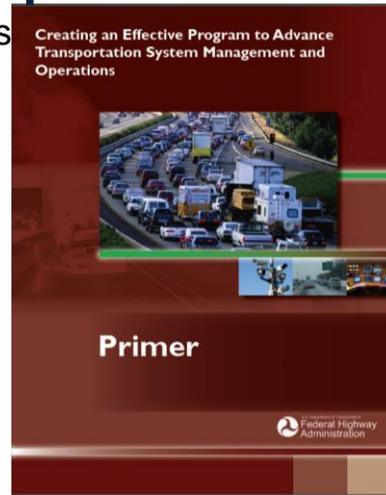


RESOURCES AVAILABLE TO SUPPORT DOT IMPROVEMENTS IN CAPABILITY FOR EFFECTIVE TSM&O



FHWA Operations Capability Workshops

- FHWA-Sponsored Operations Capability Workshops
- Can be at Statewide or Regional Level
 - Usually one day
- Participants are Managers Involved with TSM&O, Planners, Partners
- Have Conducted Full Workshop in Broward Co. with D4 and D6



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Range of Available FHWA Resources

- Integrating Operations, Safety, and Multimodal Planning Workshop
- Traffic Incident Management Peer Exchange and Workshops
- Technical Assistance for Traffic Signal Timing Training
- Work Zone Process Review Team
- Performance Measures Workshop
- Traffic Data Collection and Analysis Peer Exchange
- Operations B/C Workshops
- Outreach for Special Events Peer Training
- Integrating Road Weather Mobile Observations
- Active Traffic Management Workshop
- Rural Incident Management Workshop



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FHWA Technical Resources (Web)

U.S. Department of Transportation
Federal Highway Administration
OFFICE OF OPERATIONS

21ST CENTURY OPERATIONS USING 21ST CENTURY TECHNOLOGIES

Search Operations: Go

Reducing Non-Recurring Congestion
[Program Areas](#)

Non-recurring congestion includes the development and deployment of strategies designed to mitigate traffic congestion due to non-recurring causes, such as crashes, disabled vehicles, work zones, adverse weather events, and planned special events. About half of congestion is caused by temporary disruptions that take away part of the roadway from use – or “nonrecurring” congestion. The three main causes of nonrecurring congestion are: incidents ranging from a flat tire to an overturned hazardous material truck (25 percent of congestion), work zones (10 percent of congestion), and weather (15 percent of congestion). Nonrecurring events dramatically reduce the available capacity and reliability of the entire transportation system. This is the type of congestion that surprises us. We plan for a trip of 20 minutes and we experience a trip of 40 minutes. Travelers and shippers are especially sensitive to the unanticipated disruptions to tightly scheduled personal activities and manufacturing distribution procedures.

Aggressive management of temporary disruptions, such as **incidents, work zones, weather, and special events** can reduce the impacts of these disruptions and return the system to “full capacity.”

- [Traffic Incident Management](#)
- [Planned Special Events Traffic Management](#)
- [Work Zone Management](#)
- [Road Weather Management](#)
- [Congestion Mitigation](#)

<http://ops.fhwa.dot.gov/index.asp>

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AASHTO Guide to SO&M Improvement

- Web-Based
- Agency Self-Evaluation-Based
- Provides Custom-Tailored (Detailed) Guidance
- Appropriate Incremental Steps

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Systems Operations & Management Guidance

One-Minute Guidance Evaluation Learn About the Guidance Customized Guidance Evaluation Browse Guidance

What Is Systems Operations and Management (SO&M)?

Systems Operations and Management (SO&M) 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 precursors to achieve more effective SO&M. [Learn More >](#)

Who Should Use the Guidance and Why?

This website and its guidance is designed for transportation agency managers whose span of control relates to the operations and management of the roadway system, including policy makers and program managers related to ITS and SO&M at both the state and regional level, as well as managers of systems operations related activities such as traffic engineering, maintenance, and public safety. The guidance can be used to evaluate agency capabilities in key areas of process and institutional arrangements and to prepare a formal action plan. A self-evaluation customizes the guidance based on current agency capability. [Learn More >](#)

Why is SO&M Important?

Roadway level-of-service has significantly deteriorated over the last 20 years. Regular congestion has continued to increase, while increasing capacity is constrained by cost and impacts. And, as mobility have reached high volumes, they have become increasingly sensitive to the delay and safety impacts of crashes, construction, and weather, which together are responsible for over one-half of travel delay and most of the resulting unreliability.

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

GUIDANCE TO IMPROVE THE EFFECTIVENESS OF YOUR SO&M PROGRAM

One-Minute Guidance Evaluation
based on a checklist of your current SO&M.

Customized Guidance Evaluation
based on a customized review of your current program.



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