Organizing for Operations

SHRP2 L06

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SHRP 2

- The Second Strategic Highway Research Program (SHRP 2)
- Large scale research program
  - A nine-year,
  - $218 million
  - Due to be completed March 15, 2015
- Research is about 2/3 complete with 49 research reports completed or in production/review
- TRB
  - managed over 100 research contracts, involving more than 300 research contractors
- FHWA and AASHTO
  - beginning implementation activities for the highest priority products emanating from the research

Four Focus Areas

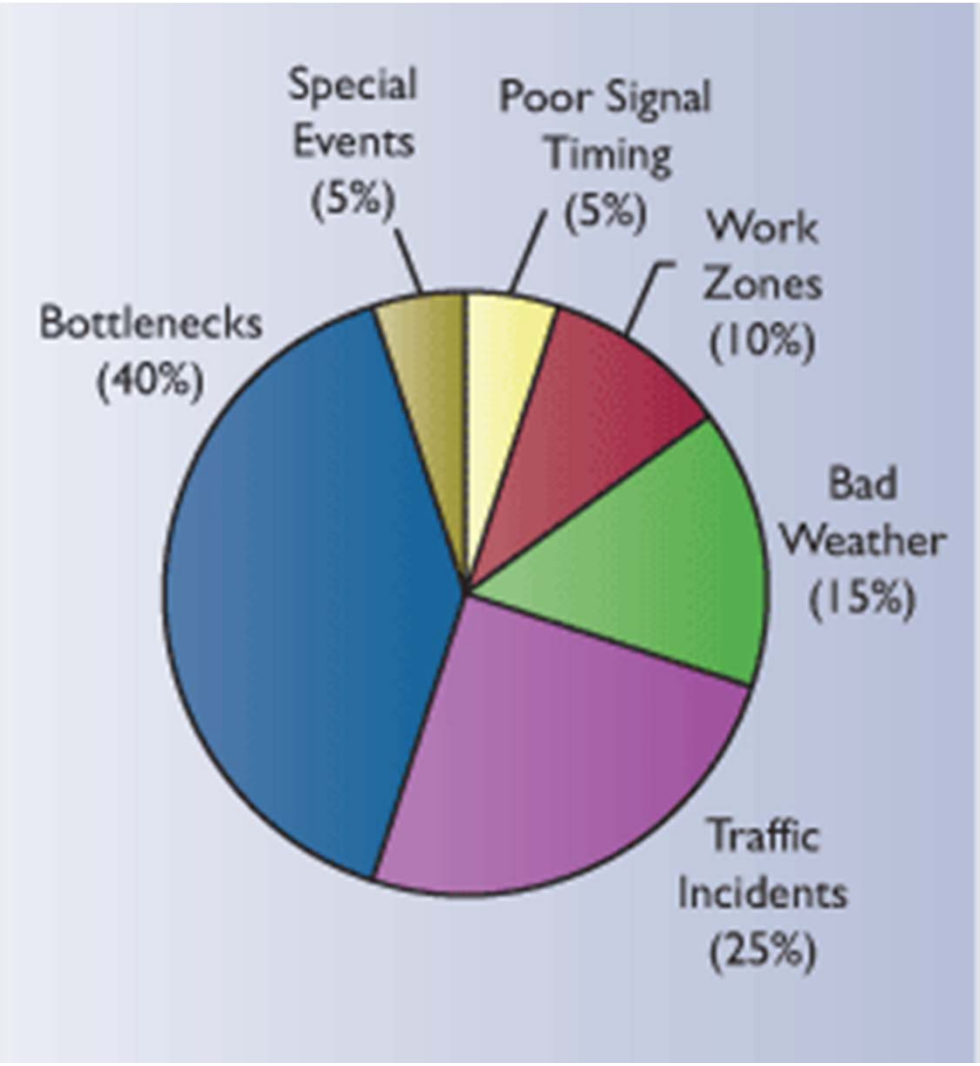
- Safety: fielding the largest-ever naturalistic driving study to reduce crashes and save lives through understanding driver behavior
- Renewal: making rapid, innovative construction possible for “ordinary” projects
- Reliability: Providing management and technical tools to reduce congestion through operations
- Capacity: Systematizing collaborative decision making to achieve better, faster project decisions

SHRP 2 Reliability Goal from TRB Special Report 260

"To provide reliable travel times by preventing and reducing non-recurring congestion"

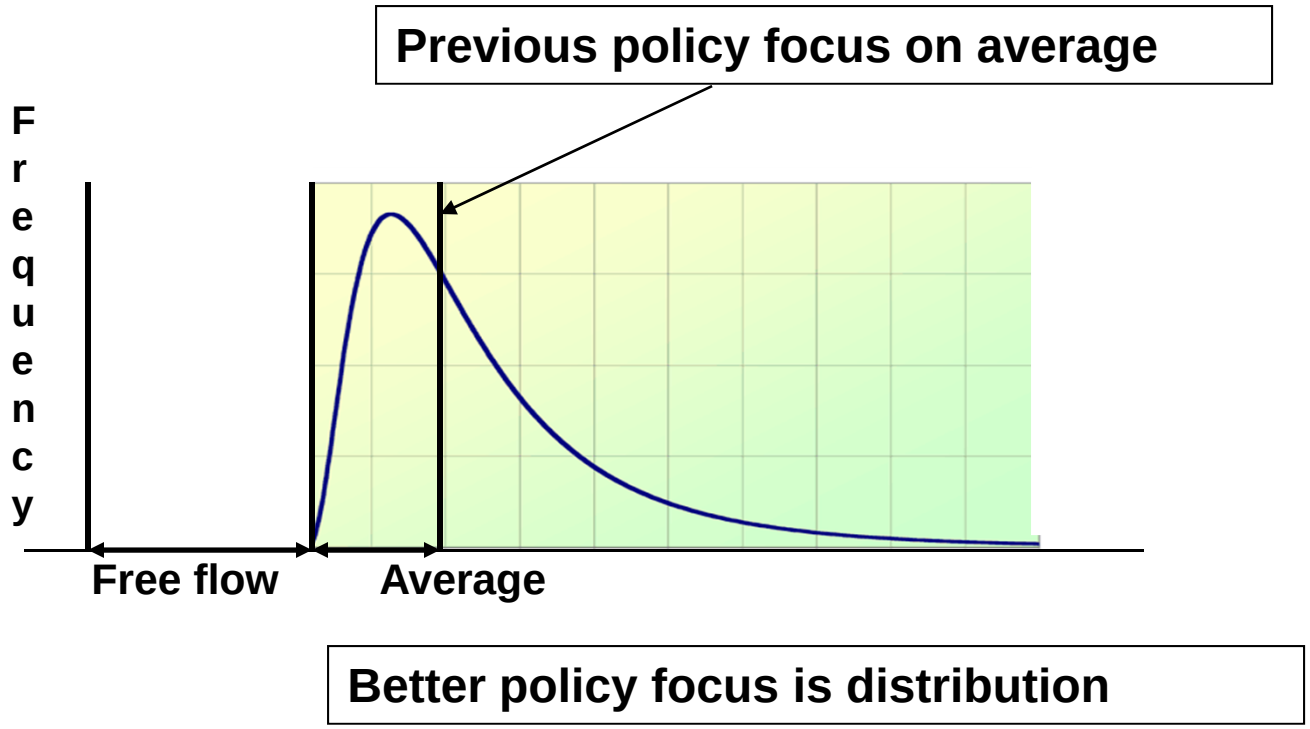
- *i.e., reduce the variability of travel time through reducing the underlying causes*

Causes of Congestions



Reliability is a measure of how travel time varies over time

- Not delay or average travel time but travel time variability
- Nearly all measures derived from the distribution of travel time

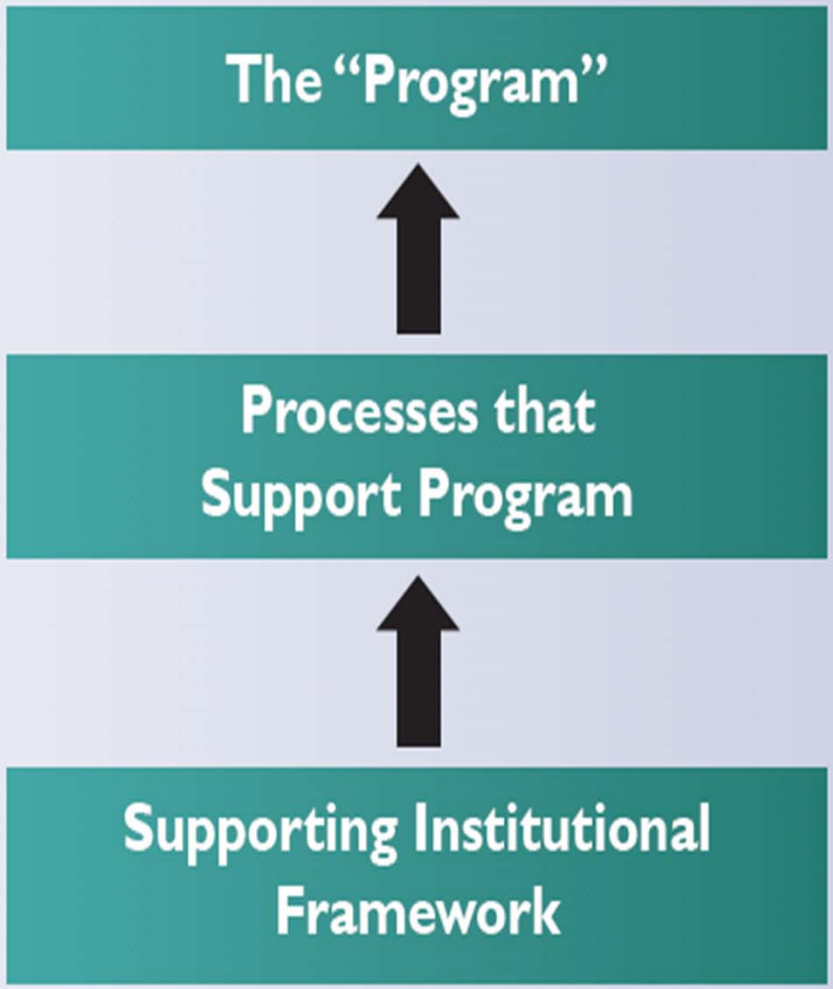


SHRP2 Reliability Products

- **Reliability Workshops for State and Public Sector Managers. (L31)**
- **Guide to Organizing Transportation Agencies to Advance Systems Operations and Management (L06)**
- **A Guide to Improving Travel Time Reliability by Integrating Business Processes (L01)**
- **Knowledge Transfer System KTS (L17)**
- **Regional Operations Academy (L36)**
- **Coordinated Training for Traffic Incident Responders and Managers (L12)**

Guidance for Improvement of Transportation Systems Management and Operations

Guidance Framework



- Identified characteristics of an effective TSM&O program
- Recognized dependence on specific business and technical processes
- Identified required organization structure and relationships

Key Dimensions of Capability Improvement Guidance (19)

Business Processes	*Systems & Technology*	*Performance Measurement*
•Planning •Scoping •Programming/Budgeting •Project development	•Regional architectures •Systems engineering •Standards/Interoperability	•Measures definition •Data acquisition •Measures utilization
Culture	*Organization/ Workforce*	*Collaboration*
• Technical understanding • Leadership/Championship • Outreach • Program Status/Authorities	•Program status •Organizational structure •Recruitment and retention •Staff development	•Public safety agencies •Local government/MPO •Outsourcing/PPP

Levels of Capability

Goal for the Future

Most Agencies Today

LEVEL 1
Performed
- Activities & relationships ad hoc
- Champion-driven

LEVEL 2
Managed
- Processes developing
- Staff training
- Limited accountability

LEVEL 3
Integrated
- Process documented
- Performance measured
- Organization/ partners aligned
- Program budgeted

LEVEL 4
Optimized
- Performance-based improvement
- Formal program
- Formal partnerships

Rules of Capability Improvement

- Key challenges *not technical* – process and institutional are required
- The six dimensions are *all essential* and interactive
- Lowest level dimension is usually the *principle constraint*
- Levels cannot be *skipped*

The Self-Evaluation Framework

Capability Dimension	Level 1	Level 2	Level 3	Level 4
Business Processes *(Planning, programming, implementation)*	Processes related to TSM&O activities ad hoc and unintegrated	Multiyear statewide O&M plan and program exists with deficiencies, evaluation, and strategies	Programming budgeting, and project development processes for TSM&O standardized and documented	Processes streamlined and subject to continuous improvement
Systems and Technology *(Systems engineering and technology interoperability)*	Ad hoc approaches outside systematic systems engineering	Systems Engineering employed and consistently used for ConOps, architecture and systems development	Systems and technology standardized, documented and trained statewide, and new technology incorporated	Systems and technology routinely upgraded and utilized to improve efficiency performance
Performance Measurement *(Measures, data and analytics, and utilization)*	No regular performance measurement related to TSM&O	TSM&O strategies measurement largely via outputs, with limited after-action analyses	Outcome measures identified and consistently used for TSM&O strategies improvement	Mission-related outputs/outcomes data routinely utilized for management, reported internally and externally, and archived
Culture *(Technical understanding, leadership, outreach, and program authority)*	Value of TSM&O not widely understood beyond champions	Agencywide appreciation of the value and role of TSM&O	TSM&O accepted as a formal core program	Explicit agency commitment to TSM&O as key strategy to achieve full range of mobility, safety and livability/ sustainability objectives
Organization/ Workforce *(Organizational structure and workforce capability development)*	Fragmented roles based on legacy organization and available skills	Relationship among roles and units rationalized and core staff capacities identified	Top-level management position and core staff for TSM&O established in central office and districts	Professionalization and certification of operations core capacity positions including performance incentives
Collaboration *(Partnerships among levels of government and with public safety agencies and private sector)*	Relationships on informal, infrequent and personal basis	Regular collaboration at regional level	Collaborative interagency adjustment of roles/ responsibilities by formal interagency agreements	High level of operations coordination institutionalized among key players – public and private

LO6-Products

1. Research reports
2. Detailed Guidance for six dimensions
3. AASHTO web tool for agency self-evaluation
4. 15 SDOT self-evaluation validation Workshops
5. Report on state-of-practice findings

- *Key: The Guidance framework and guidance itself provides context for other SHRP2 Products*

Validation: Workshops (15)

- Multiple organizations present (“partners”)
- Participant self-evaluation driven
- Participants identify strengths/weaknesses & strategies
- Results resonate with Participants

Lessons learned in workshops

- Process and institutional issues key to improvement
- Wide range of audience knowledge/engagement
- Tailor approach/media for target audiences
- Self-discovery essential to learning/”ownership”
- Peer-to-peer effective
- *SDOT’s use of new tools/methods dependant on process and institutional capabilities development*

AASHTO Web Guide

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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 preconditions 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 roadways 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.

GUIDANCE TO IMPROVE THE EFFECTIVENESS OF YOUR SO&M PROGRAM

One-Minute Guidance Evaluation
based on a *snapshot* of your current program.

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

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Business Process Example

- **LEVEL 1 TO LEVEL 2**
- **Improvement Target From** Processes related to SO&M activities ad hoc and un-integrated (L1)
- **To** Multiyear statewide SO&M plan and program exists with deficiencies, evaluation, and strategies (L2)
- **By** Establishing framework for suitable SO&M related planning and programming activities

Business Process Example

- **Key Sub-dimensions**
  - Planning Process
  - Programming/Budgeting
  - Project Development/Procurement

Business Process Example

- **Programming/Budgeting Action Plan (L1 to L2)**
  - **Strategy Summary**
    - Identify initial resource needs for logical SO&M strategies "next steps" for key districts
- **Key Actions**

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

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

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

D. Develop cooperative approach to MPO/RTPA programming and budgeting

Business Process Example

- **Rationale:** For budgeting and programming purposes, a set of preliminary cost estimates for proposed improvements is essential, including all key resource categories projected forward.
- **A.1** Develop unit cost estimates for key plan elements broken down into discrete elements and stages. Elements to be included are communications, field devices, equipment, software and systems integration, systems upgrades, structures, staffing (in terms of fulltime equivalents), and maintenance.

Business Process Example

- **A.2** Determine costs for at least a budget cycle (5-6 years). Logical increments of program should be developed that deliver discrete benefits and which are logical increments to proceeding phases (or existing systems).
- **A.3** Consideration should be given to acquisition strategies such as turnkey, leasing, and outsourcing, as these may impact costs.

Business Process Example

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

References/Examples

- Guide to Contracting ITS: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_560.pdf

- Managing High Technology Projects in Transportation (offered by the Consortium for ITS Training and Education. To Access This Resource: http://www.citeconsortium.org/courses/2mod11.html

- Best Practices In Project Delivery Management: http://onlinepubs.trb.org/onlinepubs/nchrp/docs/nchrp20-68A_07-01.pdf

- Project Management - Delivering the Capital Construction Programs at the Project Level: http://www.wsdot.wa.gov/projects/projectmgmt/

AASHTO Web Tool

www.aashtosomguidance.org

Thank You

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