

**NCHRP Project 20-7/238
Conceptual Development of an AASHTO
Guide for Systems Operations and
Management**

Project Deliverables

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SUMMARY OF INTERVIEWS

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INTRODUCTION

The purpose of this of this Technical Memorandum is to provide a summary of the interviews that were held in person at the AASHTO Subcommittee on Systems Operation and Management (SSOM) meeting in Madison, Wisconsin on July 15 – 18, 2007 and the telephone interviews that were conducted from July 17 – August 1, 2007. Twenty-four persons were interviewed in person and four by telephone. A list of those interviewed is contained in the Appendix to this technical memorandum.

The information from the interviews will be used to develop a Table of Contents and a Draft Scope of Work to develop an AASHTO Guide for System Operations and Management.

The following is information obtained for each of the interview questions. Brief conclusions are provided for each question.

RESPONSES TO QUESTIONS

Information about Agencies

1. *What existing state DOT operations guidelines and manuals does your state use in day-to-day operations? Is it possible to obtain a copy of these guidelines and manuals?*

- Coordinated Highway Action Response Team (CHART) Program
- CHART Standard Operating Procedures (SOP) for conducting day-to-day operations
- Traffic Management Center (TMC) Operations manual
- Maintenance operations manual
- Dynamic Message Signs (DMS) policy
- Emergency response & procedures manual
- Individual districts have standard operating procedures for specific items
- Maintenance Guideline-Field Guide, Traffic Control-Maintenance Guide, Construction Field Manual, Materials Testing Manual, Standard Operating Procedure (SOP) Rules
- Snow removal manual
- Service patrol manual
- Signal manual
- Traffic and safety manual of instruction, Incident management manual, and maintenance manual
- Currently revising its Intelligent Transportation Systems Center operating manual
- Local operations guidelines for day-to-day activities
- Creating a data warehouse with incident management

Conclusions:

Most State DOTs have many manuals and guidelines to for their day-to-day operations. Often these are not complete documents, but are instead individual procedures or memoranda. Many DOTs have websites containing their manuals and guidelines. A list of available manuals and guidelines will be assembled and provided with the Scope of Work for the AASHTO Guidelines.

2. *Describe how Systems Operations and Management is organized in your state? What functions are included in Operations and Management in your state?*

- Traffic and safety have been separated
- Have 600-800 interruptions/day for construction
- In regions of the state, maintenance has been expanded to include operations
- In the regions, traffic and maintenance are in an integrated section
- Systems Operations and Management is part of the Bureau of Highway Operations which also includes the State TOC, traffic, maintenance, and program management
- Have 12 districts and each district has one operations unit
- Each region includes a maintenance and operations section
- Districts have a line function and headquarters handles policy
- Headquarters controls districts with money
- State DOTs oversee the planning, construction and operation of the highway, transit, maritime and aviation facilities, as well as the Motor Vehicle Administration (MVA) and the Transportation Authority (TA)
- Operations Division includes maintenance, traffic services, ITS plan, service patrols, ITS operations, and traffic information
- Operations are decentralized
- Have a central office for operations; headquarters and districts have their own budgets
- Want to have Operations and Management high in the organization
- Have 14 districts supported by 10 central office units
- District operations & management done by each district with 3 major TMCs in each division
- Are currently merging traffic & safety with Maintenance division
- All districts have separate operations; headquarters provides software, equipment, and center communications
- Centralized for design and construction
- Routine maintenance done by districts with headquarters oversight, and inspections done by districts
- The State DOT is divided into four regions. Each region is responsible for operations, including maintenance, construction, and traffic operations. Operations activities in regions are supported by five divisions: division of traffic and safety, traffic management division, division of maintenance, division of aeronautics, and division of equipment management.
- Developing a proposed Division of Operations, which will include a section for Systems Operations and Management. The SO & M section will ultimately

include the following areas: ITS, Work Zone Administration, Congestion (Data and Analysis), Mobility (Studies and Freight Logistics), Transportation Permits, and Strategic Planning

- EMS, ITS, Maintenance, and Traffic & Safety are all in one division called “Operations”
- 90% of state roads are DOT roads
- Rail, air, and mass transit are part of DOT
- Have district maintenance (4 districts)
- There are two divisions: operations (which includes roadway operations, and snow removal) and traffic operations (which includes ITS, lane closure hours, and incident management)
- Traffic and maintenance are formed under operations management

Conclusions:

Most of the State DOTs responded that operations are decentralized in their state. The states are divided into regions/districts with Systems Operations and Management included as a subdivision of a Traffic Operations unit. The consensus was that Systems Operations and Management included aspects such as ITS, maintenance, traffic, and safety. A number of state DOTs are undergoing reorganization. There is a need for organizational information of how states are organized and what is working well.

3. *How are systems coordinated among agencies within the state?*

- Historically at regional level; a bottom up approach
- Regional TMCs stand alone but share information
- No command & control, EMS get travel info
- Systems coordinated among the following: Regional Transportation Information System (RTIS), Capital Wireless Integrated Network (CapWIN), and the Emergency Operations Reporting System (EORS)
- Through incident management groups, try to get state police to give CADD information
- Four agencies co-located in the TMC
- State Emergency Response Team (SERT)
- Follow federal guidelines, administer money to Metropolitan Planning Organizations (MPOs)
- Crashes are handled by locals, law enforcement is in-charge of crash scenes
- Division of maintenance, the division of traffic and safety, and the traffic management division all provide training, assistance, and oversight of policies and procedures to the four regions
- Methods of communication and cooperation on policy and procedures include the traffic engineering panel, the annual maintenance conference, and the annual engineering conference
- Regular meetings are held between the operations engineer, the engineer for traffic and safety, the traffic management engineer, the region traffic engineer, and the region director to coordinate traffic engineering and ITS

- Relation between the DOT & State Police have taken off last 2-3 years
- Need to expand to counties, MPO
- Localized TIM and ITS coalition meetings
- Through regional agencies such as TRANSCOM and NITTEC
- All regions have regional steering committees
- The TMC manages any modal incident – centralized operations
- Operations & Traffic Operations are well coordinated
- Operations does the road work
- Deputy Commissioner settles disputes

Conclusions:

There was no consistent way of coordinating systems among agencies within a state. Most of the state DOTs have regional Transportation Management Centers (TMCs) and Traffic Operations Centers (TOCs) that coordinate Systems Operations and Management in a state. These provide command and control and manage aspects such as the budget, policies, and procedures associated with systems operations and management. A few states have statewide management centers, which provide either full or off-peak command and control. Peak hours are operated and managed by regional centers. In some cases, Metropolitan Planning Organizations (MPOs) are involved in operations and management. A few regions have regional agencies that provide multi-state exchange of information.

4. *Would you use an AASHTO Guide for Systems Operations and Management? If yes how would you use it, and if no why wouldn't it be useful?*

- Depends on how good it is
- Will help to clarify how incidents are derived
- A website with links to everyone's stuff would be helpful
- It should include Best Practices/ Lessons learned from agencies across the country
- Will use to develop standard procedures and practices in implementing management and operations strategies between offices
- Should include National Performance Measure
- Use like the Manual On Uniform Traffic Control Devices (MUTCD); a source of framework for functions and policies
- Could be a foundational layer
- Used by AASHTO, for urbanized areas
- As a resource to see how others do it, how it should be done for new centers, and how most new TMCs are for smaller areas
- Can be used to determine who is the audience
- Best practice for middle management
- Gear toward SSOM
- Give credibility to operations within AASHTO
- Use as a road map of how to align the organization, because organizations continually need improvement
- Use as a vehicle to move research into the main stream

- Provide a one-stop-shop of current standards of practice
- To establish uniformity among regions, and learn what other states are doing to apply best practices
- Report should be issued on a periodic basis to capture the latest innovations in operations among the state DOTs
- Manual should concentrate on the technical aspects of system operations rather than institutional for these reasons: 1) Institutional arrangements and organizational structure vary from state to state, and guidance on institutional issues may be hard to apply to a particular state, 2) From the perspective of highway users and interstate travelers, uniformity from state to state in traffic operations is a desirable national goal – for example, in features provided on 511, interpreting VMS messages, driver's expectations in approaching incident scenes, etc. 3) Available technology is common to all states
- Can be used for the next generation DOT
- Must be based on Concept of Operations & NIMS
- Must be user friendly
- Puts all information in one place
- Helps in training and with policy
- Not sure
- No, would not use it. Basically because every region and municipality has different needs and roadway conditions. I would use it more for center-to-center between regions or states.

Conclusions:

All but two of the interviewees responded that they would use an AASHTO guide for Systems Operations and Management. One representative said that they weren't sure if they would use the guide and the other said that they would not use the guide commented that it would not be used locally but would use it more for coordinating operations between regions and on a state to state basis. General comments were that the guide would be used as a reference to establish best practices and performance measures. Also mentioned was that the guide would be helpful in developing standard procedures and practices in implementing management and operations strategies nationwide. It should be simple to use and one should be able to get the information they need quickly.

5. *What aspects of Operations and Management in your state need improvement that you think a Systems Operations and Management guide might help with?*

- Consistency and relative priority of different functions between regions
- Priority of active vs. passive traffic systems
- To know of and use Best Practices
- Uniform Performance Measures
- Different agencies having the same goal
- Life cycle/costs of devices
- Performance warrant needs
- Work window is getting smaller

- Planning, performance measurement, operations coordination, transportation emergency management, work zone management, legal and maintenance
- Standard interagency agreement- should have samples in Appendix
- Start-up operations
- High level strategic planning, not a good understanding of systems management, and mainstream operations
- TMC staffing levels, salary levels of TMC staff, and yearly cost of operating a TMC 24/7
- Use it to make sure they are headed in the right direction
- Consistency in traveler information and ITS applications between urban metropolitan areas and rural areas, and in 24/7 operation
- Standards for Electronic Variable Message Signs (VMS) use and message standards
- Planned closures for maintenance and construction
- Work zone traffic control and “lane rental” to minimize disruption to traffic
- Congestion Mitigation, commuter crunch
- Quick Clearance
- Mobility
- Central office needs to set one up for center-to-center operations and management
- Signal Optimization – When & How
- Develop realistic life cycles for equipment, replacement life cycles
- Funding & resource issues
- Operations should be mainstreamed

Conclusions:

The Guide would serve a wide range of needs from starting to updating operations and management. Some aspects that were repeatedly mentioned included strategic planning, work zone management, prioritizing, performance measures, best practices, national consistency and overall management.

Content of Guide

6. *Should the guidelines include sections on:*

a. Planning

i. If yes please explain and give example, if no please explain why not.

Results of Interviews: Yes (21), No (1), Not Sure (0)

- Give examples in bullet form
- At the high level
- Identify life cycle cost
- Long range transportation planning
- How to incorporate near-term management and operations into planning and assess the trade-offs between these strategies and major capital improvements
- Address links between system engineering, repair & maintenance, and systems operations and management

- Programming in Statewide Transportation Improvement Programs (STIP)
- What parts of the system are carrying most of the load
- Planning is first and most important
- With limited emphasis-there are too many unique organizational issues
- Must be a direct tie between planning and operations
- Guide needs to address how the statewide planning process works and the incorporation of systems engineering

Conclusions:

From all of the interviews conducted, twenty-one representatives of the State DOTs responded that planning should be included in the guide, whereas only one responded that it shouldn't be included. In further explanation, some comments included that planning is the key to success and that the guide would be used for long range transportation planning. Also mentioned was that the guide needs to address how the statewide planning processes works and needs to incorporate systems engineering.

b. Budgeting

i. If yes please explain and give examples, if no please explain why not.

Results of Interviews: Yes (20), No (1), Not Sure (1)

- Examples in bullet form
- At the high level
- For new improvements
- What is the rule of thumb?
- Need to establish more responsive and flexible budget management processes, and help with the process of obtaining federal funds
- Cost information
- Development of existing budgets
- Need a template in state budgets
- Realistic cost of TMC Operations
- Not sure if it should be included
- With limited emphasis-there are too many unique organizational issues
- It should create a prioritization process

Conclusions:

From all of the interviews conducted, twenty representatives of the State DOTs responded that budgeting should be included in the guide, whereas only one responded that it shouldn't be included and one wasn't sure. In further explanation, some comments included that the guide would be used to help the budget management processes and also help with the process of obtaining federal funds.

c. Performance Measures

i. If yes please explain and give examples, if no please explain why not.

Results of Interviews: Yes (21), No (1), Not Sure (0)

- To establish a definition
- In terms of optional vs. recommended performance measures

- Travel times, Closed Circuit Television (CCTV) on line, 511
- May be difficult to derive
- Help identify a few performance measures that are results oriented while also standardizing how the measures are reported
- No, not under any political pressures to have performance measures
- Not detailed
- Keep updated with best practices
- Dynamic process
- Case studies
- Need to measure success and determine how success is defined
- What is considered an intangible
- Suggest measures that are commonly used by state DOTs
- Might be helpful if there were more nationwide adoption of the same measures across the country, allowing states to better benchmark themselves against their peers
- More for equipment
- Collecting a lot of data; do not have resources to analyze

Conclusions:

From all of the interviews conducted, twenty-one representatives of the State DOTs responded that performance measures should be included in the guide, whereas only one responded that it shouldn't be included. In further explanation, some comments included that the guide will help to clarify recommended vs. optional performance measures and identifying performance measures that are results oriented while also standardizing how measures are reported. The one representative that thought it should not be included commented "not under any political pressure to have performance measures."

d. Benchmarks or standards of practice

i. If yes please explain and give example, if no please explain why not.

Results of Interviews: Yes (22), No (0), Not Sure (0)

- Standardizing practices would also serve to create uniform performance measures that could be compared between states
- A benchmark would establish attainable goals or targets that would serve as a barometer for the effectiveness of programs
- Be cautious, broad and flexible
- National & Local
- Have goals
- Peer benchmarks
- For small and medium TMCs, and based on type of center & function
- Need stakeholder buy-in
- National with state benchmarks
- Need states to measure the same way
- Within agencies and how do they compare nationally

- Internal and external
- Regional better than national
- Would be very valuable, perhaps the most important part of the guide
- It should be produced with per capita and roadway geometry as considerations

Conclusions:

From the interviews conducted, all of the twenty-two representatives of the State DOTs responded that benchmarks/standards of practice should be included in the guide. In further explanation, some comments included that the guide will create uniform performance measures that could be compared between states and benchmarks could establish goals/targets for the effectiveness of programs.

e. Intelligent Transportation Systems standards development and deployment

i. If yes please explain and give examples, if no please explain why not.

Results of Interviews: Yes (22), No (0), Not Sure (0)

- National Standards
- Its relation to traffic management, and as a tool for operations
- Need compatibility & interoperability
- Need guidance on integrating ITS into the overall management and operations process within organizations
- Basic standard with flexibility and ability to add-on
- Keep up with technology, staff burdens, IT burdens
- What works well, life cycle, when should equipment be changed (most cost effective), need asset management
- Align with initiatives
- Guidance on placement and location of ITS components(i.e. locations of VMS, cameras, and traffic monitoring stations)
- TMCs need to work together

Conclusions:

From the interviews conducted, all of the twenty-two representatives of the State DOTs responded that ITS standards should be included in the guide. In further explanation, some comments included that the guide could be used to establish compatibility and interoperability. Also mentioned is that guidance is needed on integrating ITS into the overall operations and management process within organizations.

f. Traveler information

i. If yes please explain and give examples, if no please explain why not.

Results of Interviews: Yes (20), No (1), Not Sure (1)

- Need to define
- No, not necessary in this document, there are already many existing guidelines at the national level

- Not sure
- An essential part of operations, so it must be current and interactive
- Weather is a must
- Needed for local travelers
- Needed to try and centralize information in a statewide center
- Next generation 511, new probe technology, and gaps in changing technology
- Uniformity of DMS messages
- The goal of providing travelers more uniformity from state to state in 511 and VMS use
- Standard messaging scheme recommendations

Conclusions:

From all of the interviews conducted, twenty representatives of the State DOTs responded that traveler information should be included in the guide, whereas only one responded that it shouldn't be included and one wasn't sure. In further explanation, some comments included that this is an essential part of operations and that it must be current and interactive. Also mentioned is that 511 should be instituted nationally as a source of travel information. The one representative that thought traveler information shouldn't be included commented that there are already many existing guidelines on traveler information at the national level.

g. Transportation/Traffic Incident Management

i. If yes please explain and give examples, if no please explain why not.

Results of Interviews: Yes (22), No (0), Not Sure (0)

- Needed for traffic incident management strategies that can help highway agencies to expedite the detection and clearance of major and minor traffic incidents with the goal of returning to normal operations capacity as quickly as possible
- Guidance on fostering inter-agency cooperation
- Need to be able to tell you more than just that there is an incident
- A major function
- Need an I-95 guide, links to available information
- Best practices, corridor movement or traffic, and case studies
- Expand to all events, Emergency Traffic Operations (ETO)
- Guidance on performance standards for time to respond or frequency of motorist assist services
- How many personnel are needed to provide various levels of service?
- Need some "lessons learned" guide to a program
- Should include Emergency Transportation Management

Conclusions:

From the interviews conducted, all of the twenty-two representatives of the State DOTs responded that incident management should be included in the guide. In further explanation, some comments included that the guide should include strategies that help to expedite the detection and clearance of both minor and major incidents. Also

mentioned was that the guide should include case studies and offer assistance to achieving inter-agency cooperation. Probably the most compelling issue mentioned is that there should be a way to give you the details as well as telling you there is an accident.

h. Work Zone management

i. If yes please explain and give examples, if no please explain why not.

Results of Interviews: Yes (22), No (0), Not Sure (0)

- Identify strategies for collecting and sharing real-time information
- Strategies could improve traffic operations in and around work zones as well as enhance safety of the motorists and construction personnel
- A cross cutting issue
- Best practices
- Put in devices before construction and use these devices during construction
- Link to FHWA guide, and page of URL's
- New work zone rule, manage traffic in corridor, network management considerations, coordination between contractor & DOT, have good case studies
- Bring maintenance & utility work zones under one umbrella
- Implement work zone rule in a real situation
- Particularly include methods to minimize delays in work zones
- Should address how to reach motorist and why. Lessons learned as well

Conclusions:

From the interviews conducted, all of the twenty-two representatives of the State DOTs responded that work zone management should be included in the guide. In further explanation, some comments included that the guide should include strategies that help to improve traffic operations in and around work zones as well as enhance the safety of motorists and construction personnel. Also mentioned was the need to identify strategies for collecting and sharing real-time information to the traveling public.

i. Marketing

i. If yes please explain and give examples, if no please explain why not.

Results of Interviews: Yes (18), No (4), Not Sure (0)

- Should rename to “making the case for operations”
- Market the influencer
- Provide information on its benefit and how to market to customers such as 511
- No, put it in planning and budgeting sections
- How to inform the public about their role as users in the operations and management, of the transportation system, and on how to open two-way communications with the users of the system.
- Need budget/cost analysis
- Needs to address who is the customer and find out what the customer wants

- Education and workshops
- Personal relationships by TMC with major local impactors
- No, more of an institutional issue
- Frustration on how to market to legislations
- Need outcome benefits
- No, marketing is a unique creature to particular areas. One size does not fit all.
- Is operations the best word, maybe use “mobility?”

Conclusions:

From all of the interviews conducted, eighteen representatives of the State DOTs responded that marketing should be included in the guide, whereas only four responded that it shouldn't be included. In further explanation, some comments included that the guide will help to establish who the customer is and what the customer wants. Also mentioned was that the guide could provide direction on how to inform the public about their role as users in the operation and management of the transportation system. The representatives who thought this should not be in the guide mentioned that marketing should be in the planning or budget sections.

j. Research and Development

i. If yes please explain and give examples, if no please explain why not.

Results of Interviews: Yes (14), No (8), Not Sure (0)

- Guide should help to establish what it is
- No, may be a distraction
- No, is a broad subject and there are already many processes in place for transportation research & development
- Pooled fund studies, and finding groups with common interests
- Guide as to where to go for information
- Must be practical
- Low priority
- How information technology group in administration works with information technology group for traffic
- A bibliography or reference source directing users to available research might be helpful
- No, each region/state in the country should develop their own

Conclusions:

From all of the interviews conducted, fourteen representatives of the State DOTs responded that research and development should be included in the guide, whereas eight responded that it shouldn't be included. In further explanation, some comments included that the guide should include where to go to for information, and that the research needs to be practical to be valuable. The representatives who thought this should not be in the guide mentioned that research and development could be a distraction, is a broad subject, and that there are already many processes in place.

k. Quality Control

i. If yes please explain and give examples, if no please explain why not.

Results of Interviews: Yes (18), No (3), Not Sure (1)

- What it is, examples, case studies, and checklist
- A cross cutting issue
- Identify what controls should be in place for specific performance measures
- What efforts should be taken to ensure data quality?
- What mechanisms are in place to validate data?
- Maintenance of devices
- Need model to follow
- Can play a role
- Data and information must be reliable
- This would be helpful to keep vendors in the industry honest

Conclusions:

From all of the interviews conducted, eighteen representatives of the State DOTs responded that quality control should be included in the guide, whereas only three responded that it shouldn't be included and one wasn't sure. In further explanation, some comments included that a guide would help identify what controls should be in place for specific performance measures. Also mentioned was that the guide should be able to answer the questions, "What efforts should be taken to ensure data quality?", and "What mechanisms are in place to validate data?" The representatives that thought this shouldn't be included commented that there are already many existing guidelines on quality control at the national level.

l. Training of staff/personnel

i. If yes please explain and give examples, if no please explain why not.

Results of Interviews: Yes (22), No (0), Not Sure (0)

- Knowledge, skills, and abilities (KSA)
- Recommend training curriculums for operations personnel based on their functional responsibilities
- Always have a shortage, and we do not have a training program
- Help with the difficulty to hire people, planning vs. operations, and short term training vs. long term improvement
- Example concept of an "Operations Academy"
- List of available training courses, workforce training, and what training will be needed to educate an operations "professional"
- Include information on retention of personnel
- Needed because no adequate resources are available
- A basic guide to give each region an idea on how to approach staffing
- Training of staff/personnel could be done by using AASHTO procedures and using webinars

Conclusions:

From the interviews conducted, all of the twenty-two representatives of the State DOTs responded that training of staff/personnel should be included in the guide. In further explanation, some comments included that the guide should include a list of available training courses, and recommend training curriculums for operations personnel based on their functional responsibilities. Also mentioned was the need identify the KSA requirements for staff.

m. Litigation issues

i. If yes please explain and give examples, if no please explain why not.

Results of Interviews: Yes (18), No (4), Not Sure (0)

- Provide guidance on operations and management activities that can lead toward litigation and suggest ways to avoid or handle them
- Address wide-ranging legal issues
- Recommend ways to develop policies that will reduce the amount of litigation operations personnel can be exposed to
- Sample of practice, quick clearance, sample legislation
- Should video be recorded
- Risk of not doing something
- Use best engineering judgment
- Is doing something better than not doing anything at all?
- Risk of not doing something causing secondary accidents
- Quick clearance – liability
- What worked well and what did not
- Damage to vehicles by service patrol
- Document why a decision was made
- Pursue private partnerships
- Basic guidance on the legal principles would be helpful
- We all need to be aware of the legal aspects ITS will introduce, from videotaping to accurate information

Conclusions:

From all of the interviews conducted, eighteen representatives of the State DOTs responded that litigation issues should be included in the guide, whereas only four responded that it shouldn't be included. In further explanation, some comments included that the guide should provide direction on activities that can lead toward litigation and suggest ways to handle or avoid them. Also mentioned was that the guide could recommend ways to develop policies that will reduce the amount of litigation operations personnel can be exposed to. The representatives who thought this should not be in the guide mentioned that although litigation is important in today's environment it may not be necessary in this guide.

n. Maintenance

i. If yes please explain and give examples, if no please explain why not.

Results of Interviews: Yes (20), No (2), Not Sure (0)

- Preventive maintenance
- Maintenance of traffic, device maintenance, and traffic asset management
- To communicate real-time traffic information to the traveling public to minimize traffic delays during scheduled maintenance activities
- A system is only as good as it is maintained
- Field devices need focus
- Move to outsourcing
- Good practices
- Life cycle
- Include most efficient way to pay
- Emphasis on safety or traffic-oriented issues – signing, pavement markings, guardrail, lighting, traffic signals, maintenance work zones, etc.
- Should be a guide on best practices to keep equipment operational. For example, lightning is a huge problem in Florida.

Conclusions:

From all of the interviews conducted, twenty representatives of the State DOTs responded that maintenance should be included in the guide, whereas only two responded that it shouldn't be included. In further explanation, some comments included that the guide should have an emphasis on safety or traffic-oriented items - signing, pavement markings, guardrail, lighting, traffic signals, maintenance work zones, etc. Also mentioned was the need to address preventive maintenance and the fact that a system is only as good as it is maintained. Most important is winter maintenance, which includes snow and ice removal, coordination of personnel, etc. The representatives that thought it should not be included commented that maintenance guidelines already exist; the only challenge is keeping them current.

7. *If not mentioned above what else do you believe should be included in the guidelines? Do you have any comments or suggestions you wish to add? Please refer to specific question numbers if your remarks apply to preceding questions.*

- Transportation Emergency Management- discuss strategies related to transportation infrastructure monitoring and security
- Case studies of how operations and management should be organized within a DOT
- Coordination of transportation emergency management and evacuation planning with emergency management agencies
- Work Zone Guide - Safety of the motorists as well as the construction workers
- What are the benefits of operations?
- Make it in such a way that new operators can understand operations
- District management can read it easily and add features to their own system
- Should include sections on education, organization, and sustainability
- How to have effective operations

- Sustainability: (1) Is a change necessary, (2) will it give a large benefit, and (3) is the change voluntary or not?
- The following are helpful in improving our operations: (1) Peer review by experts, conducted with a visit and face-to-face communication, (2) Self-assessment tools (that are realistic and not overly academic), (3) Scan tour visits to our counterparts in other states
- Should cover both urban & rural issues
- If it becomes web accessible, there should be links to examples and contact information
- Reimbursement issues – takes too long and takes too much time
- Cannot finish documentation before the next one starts
- National uniformity

In Conclusion:

Most State DOTs mentioned that the guide should include topics such as the coordination of transportation emergency management, and a work zone guide that addresses the safety of the motorist as well as the construction workers. Also mentioned is the need for self-assessment tools that will help the agency to address areas in which they need improvement; areas that will ultimately be improved by utilizing the guide. Organizational options for the operations and management function within a DOT should be provided through case studies.

Format of Guide

8. *What format would be most useful for the guide and why? (text, examples, case studies, other)*

- Electronic/Online/Web based
- Should have a section to post additional information
- Case Studies
- Chat page
- Keep up to date/ update annually
- Links/ URLS to other sites of other guides
- Have workshops
- Narrative text format would be the most useful, providing specific guidelines for the various issue areas. Also stand- alone sections that can be excerpted to provide guidance to personnel with specific duties.
- Update 24 to 36 months after first edition, then more frequently after that
- Need good quality control
- Be like the green book
- Executive summary in hard copy and other sections on CD
- Should have an ability to comment
- Need a full-time web master
- Only contain things that cannot be found elsewhere
- Organizational, technical, field operations such as work zone management

- Sample presentations
- Should have two major parts: organizational(includes planning, budgeting, performance measures, marketing, training of staff/personnel) and institutional structure
- Need Quality Assurance/Quality Control (QA/QC) on updates
- Have organized chapters
- Interactive Tool
- Should have a new ideas website
- Outline format with link to information you are interested in
- Easy to use
- Must be a “how to”, meaning that it should show you exactly what to do
- The guideline should be formulated in the following order: planning, design, implementation, operation, training, and then maintenance.

In Conclusion:

- All DOTs mentioned that the primary purpose of the guide is to be used as a reference and that the format of the guide should be on-line and web based except the executive summary which should be provided in a hard copy. Also mentioned is that the guide should be updated frequently possibly annually, or every 2-3 years. It was suggested to have a chat page in which people would be able to post additional information and ask questions. Another idea was to have the ability to distribute the guide via CDs, and that the guidebook needs to have links/URLS to other sites and other guides. Finally a unique suggestion was that the guide should be presented in a way that corresponds with the following order: planning, design, implementation, operation, training, and then maintenance.

SUMMARY

Twenty-eight persons were interviewed to obtain information about their agencies and their opinions on the content and format of an AASHTO Guide for Systems Operations and Management. Most interviews would use such a guide as a reference to help in developing standards procedures and practices if the guide was easy to use.

Guidelines and manuals are available from many states although more information is held in-house in the form of memoranda and procedures. Systems Operations and Management is organized differently in each state and is undergoing change in a number of them. Areas of particular needs are strategic planning, work zone management, prioritizing activities, performance measures, best practices, national consistency and overall management.

The content of the Guide should include sections on:

- Planning
- Budgeting
- Performance Measures

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- Benchmarks or standards of practice
- Intelligent Transportation Systems standards development and deployment
- Traveler information
- Transportation/Traffic Incident Management
- Work Zone Management
- Marketing
- Research and Development
- Quality Control
- Training of staff/personnel
- Litigation issues
- Maintenance
- Coordination of efforts
- Self-Assessment tool
- Organizing for operations and management

It was suggested that the Guide be in electronic format, possibly as a web-based document. An executive summary should be in hard copy. The Guide should be updated every two to three years. It was also suggested to have an electronic chat page on a website to post information and questions.

APPENDICES

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<u>Name</u>	<u>Title</u>	<u>Agency</u>	<u>Phone #</u>	<u>Cell Phone #</u>	<u>E-mail Address</u>
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Steve Varnedoe	Chief Engineer- Operations	North Carolina DOT 1537 Mail Service Center Raleigh, NC 27699-1537	(919) 733-7621	(919) 812- 5278	svarnedoe@dot.state.nc.us
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Survey Questionnaire

**CONCEPTUAL DEVELOPMENT OF AN AASHTO GUIDE TO
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NCHRP 20-7 Research Proposal

Systems operations and management is becoming recognized as a discipline focused on maximizing the efficiency and safety of the transportation network. It requires attention from and coordination of many functions in a state DOT, including traffic engineering, maintenance, ITS, safety, planning, design and construction.

The AASHTO SSOM recently acquired research funds through the NCHRP 20-7 program to develop the scope and outline for an AASHTO Guide to Systems Operations and Management. The contractor for this effort is Walter Kraft of Eng-Wong Taub & Associates. We have identified you as someone to interview to give input on what you would like to see in the guide. Your feedback will be extremely valuable. Thank you for participating.

Please provide the name of the person completing the questionnaire or another agency representative who may be contacted for clarification or for additional information:

Name: _____
Title: _____
Agency: _____
Address: _____
City/State/Zip: _____
Telephone: _____ Fax: _____
Cell Phone: _____ Email: _____

Please answer the following questions:

2. What existing state DOT operations guidelines and manuals does your state use in day-to-day operations? Is it possible to obtain a copy of these guidelines and manuals?

3. Describe how Systems Operations and Management is organized in your state? What functions are included in Operations and Management in your state?

4. How are systems coordinated among agencies within the state?

5. Would you use an AASHTO Guide for Systems Operations and Management? If yes how would you use it, and if no why wouldn't it be useful? _____

6. What aspects of Operation and Management in your state need improvement that you think a Systems Operations and Management guide might help with?

7. Should the guidelines include sections on:

a. Planning

ii. If yes please explain and give example, if no please explain why not.

o. Budgeting

i. If yes please explain and give examples, if no please explain why not.

p. Performance Measures

i. If yes please explain and give examples, if no please explain why not.

q. Benchmarks or standards of practice

i. If yes please explain and give example, if no please explain why not.

- r. Intelligent Transportation Systems standards development and deployment
 - i. If yes please explain and give examples, if no please explain why not.

- s. Traveler information
 - i. If yes please explain and give examples, if no please explain why not.

- t. Transportation/Traffic Incident Management
 - i. If yes please explain and give examples, if no please explain why not.

- u. Work Zone management
 - i. If yes please explain and give examples, if no please explain why not.

- v. Marketing
 - i. If yes please explain and give examples, if no please explain why not.

- w. Research and Development
 - i. If yes please explain and give examples, if no please explain why not.

- x. Quality Control
 - i. If yes please explain and give examples, if no please explain why not.

y. Training of staff/personnel

- i. If yes please explain and give examples, if no please explain why not.

z. Litigation issues

- i. If yes please explain and give examples, if no please explain why not.

aa. Maintenance

- i. If yes please explain and give examples, if no please explain why not.

8. What format would be most useful for the guide and why? (text, examples, case studies, other) _____

9. If not mentioned above what else do you believe should be included in the guidelines? Do you have any comments or suggestions you wish to add? Please refer to specific question numbers if your remarks apply to preceding questions.

← - - - - Formatted: Bullets and Numbering

List of Reference Materials obtained from Interviews of State DOT Operations Managers – July 15 to 18, 2007

2. *What existing state DOT operations guidelines and manuals does your state use in day-to-day operations?*
 1. Douglas Rose, Michael Zezeski, Maryland DOT
 - Maryland State Highway Administration's (SHA) Maintenance Activity Guidelines Manual
 - Manuals on CD
 - Coordinated Highway Action Response Team (CHART) Operations Manual for the Maryland State Highway Administration (SHA)
 2. Steve Varnedoe, North Carolina DOT
 - DMS Policy
 - Manuals on CD
 - Maintenance Operations Manual
 - Emergency Response & Procedures Manual
 3. John Wells, Louisiana DOT
 - TMC Operations Manual
 - Manual of Standard Practice
 - This manual can be found at this website:
§ <http://www.dotd.louisiana.gov/doclist.asp?ID=63>
 4. John Friend and Jason Gutting, Michigan DOT
 - Maintenance manuals, traffic and safety procedures and notes
 - Emergency response manuals
 - Intelligent Transportation System policies and standards
 5. Melinda McGrath, Mississippi DOT
 - Maintenance Guidelines – Field Guide
 - Traffic Control – Maintenance Guide
 - Construction Field Manual
 - Materials Testing Manual
 - SOP Rules
 6. Carlos Braceras and Dave Kinnecom, Utah DOT
 - Traffic Operations Center Manual
 - Incident Management Manual
 - Maintenance Manual
 - Traffic and Safety Manual

- This manual can be found at this website:
§ <http://www.sr.ex.state.ut.us/main/f?p=100:pg:9021168700459337285:::T,V:581,6071>
- Statewide ITS Deployment Plan
 - This manual can be found at this website:
§ <http://www.sr.ex.state.ut.us/main/f?p=100:pg:9021168700459337285:::1:T,V:191,22236>
- 8. John Corbin, Wisconsin DOT
 - Manuals on CD
 - Highway Maintenance Manual
 - Traffic Operations Manual
- 8. Peter Vega, Florida DOT (District Two)
 - Jacksonville SOP for TMC
- 9. Dave Clements and Ed Roberts, New York State DOT
 - Regional TMC manuals
 - ITS Policy for Closed-Circuit Television (CCTV)
 - This manual can be found at this website:
§ <https://www.nysdot.gov/portal/page/portal/divisions/operating/oom/transportation-systems/systems-optimization-section/ny-moves/documents>
 - Transportation Maintenance Training - Evaluation Guides
 - This manual can be found at this website:
§ <https://www.nysdot.gov/portal/page/portal/divisions/operating/oom/transportation-maintenance/evaluation-guides>
 - Work Zone Traffic Control Manual
 - This manual can be found at this website:
§ <https://www.nysdot.gov/portal/page/portal/divisions/operating/oom/transportation-systems/safety-program-technical-operations/work-zone-control>
- 10. James Hogan, New Jersey DOT
 - Snow Removal
 - Traffic Operations Guidelines (TMC)
 - ESP Manual
 - Work Zone Safety Set-Up Guide
 - This manual can be found at this website:
§ <http://www.state.nj.us/transportation/publicat/>
- 11. Larry Tibbits, Michigan DOT
 - Maintenance Work Zone Traffic Control Guidelines
 - This manual can be found at this website:
§ http://www.michigan.gov/mdot/0,1607,7-151-9623_26663_27353---,00.html

- MDOT ITS Strategic Plan
 - This manual can be found at this website:
§ http://www.michigan.gov/mdot/0,1607,7-151-9615_44489---,00.html
- 12. Steve Takigawa, Steve Price, and Michael Miles, California DOT
 - Transportation Management System (TMS) Master Plan
 - This manual can be found at this website:
§ <http://www.dot.ca.gov/hq/traffops/sysmgtpl/>
 - Maintenance Manual
 - This manual can be found at this website:
§ <http://www.dot.ca.gov/hq/maint/manual/maintman.htm>
- 13. Gene Donaldson, Delaware DOT
 - Traffic Controls for Street and Highway Construction, Maintenance, and Utility Operations
 - This manual can be found at this website:
§ http://www.deldot.gov/information/pubs_forms/manuals/safety_manual/index.shtml
- 14. Alfred Kosik, Texas DOT
 - Maintenance Management Manual
 - Maintenance Operations
 - Snow and Ice Control Operations Manual
 - Transportation Multimodal Systems Manual
 - These manuals can be found at this website:
§ http://www.dot.state.tx.us/services/general_services/manuals.htm
- 15. John Conrad, Washington DOT
 - Maintenance Manual
 - Statewide Snow and Ice Plan
 - Emergency Relief Procedures Manual
 - Traffic Manual
 - Work Zone Traffic Control Guidelines
 - These manuals can be found at this website:
§ <http://www.wsdot.wa.gov/fasc/EngineeringPublications/library.htm>
- 16. Javier Rodriguez, Florida DOT (District Six)
 - Standard Operating Guidelines
- 17. Greg Laragan, Idaho DOT
 - Manuals on CD
 - Traffic Manual
 - Maintenance Manual
 - Emergency Response Guidebook

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- Chapter 7** The Operations and Management Self-Assessment Guidance
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 - ii. Strategy 2: Measure/ Benchmark Performance Against Best Practice
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 - i. Conduct Agency wide Workshop
 - II. Step 2: Implementation of Methods – Programmatic Change
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 - ii. Develop Policies and Procedures
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 - II. Keys to Success
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