

Advancing Regional Transportation Operations: A National Workshop

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TRANSPORTATION RESEARCH
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**Advancing Regional
Transportation
Operations**

A National Workshop

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TRANSPORTATION RESEARCH CIRCULAR E-C150

**Advancing Regional
Transportation Operations**
A National Workshop

**December 10–12, 2008
Washington, D.C.**

Sponsored by
Transportation Research Board

Supported by
Federal Highway Administration
National Traffic Incident Management Coalition

Rapporteurs
Jocelyn K. Bauer
Michael C. Smith

June 2011

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Executive Summary

Seventy-four leaders in transportation systems management and operations convened in Washington, D.C., December 10–12, 2008, to identify ways to advance regional transportation operations and improve regional transportation system performance. Participants came from a variety of organizations including metropolitan planning organizations, state transportation departments, state police, transit operators, local government, the U.S. Department of Transportation, and research and consulting agencies. The workshop was sponsored by the Transportation Research Board's Regional Transportation Systems Management and Operations Committee with support from FHWA, in cooperation with the National Traffic Incident Management Coalition.

The workshop was organized around three aspects of regional transportation operations: (a) answering the who, what, and how of regional operations, (b) making regional operations a reality, and (c) monitoring performance to gauge success. Through panel discussions, breakout groups, and conversation circles, workshop participants identified effective approaches for advancing regional transportation operations for each of these focus areas. Participants also discussed actions at the national level for advancing regional operations, including research, technical support, and legislative changes. This circular is a summary of the workshop as prepared by two workshop rapporteurs.

Opening speakers emphasized the necessity of anticipating the needs of transportation customers through innovative solutions and a focus on moving people and freight, not just vehicles. Advancing regional operations requires increased attention on arterials as crucial economic pathways, overcoming the boundaries between local operators, and closely coordinating the activities of transit and highways operators. According to an opening speaker, the case for regional operations can be made by demonstrating that regionalism is in the self-interest of individual jurisdictions and agencies.

Although no single approach emerged, several significant themes were discussed by attendees: initiating a regional operations effort with a limited number of collaborators and a defined focus, acting quickly to achieve near-term results, and then expanding to other stakeholders and operations areas. Several panelists and attendees addressed the necessity of developing a common vision, mission, set of objectives, and strategy in preparing for effective regional operations; examples included the regional concept for transportation operations and the National Unified Goal for Traffic Incident Management.

Workshop participants saw several opportunities at the national level for advancing regional transportation operations. Suggestions included the following:

- Obtaining legislative authority to form regional entities or to empower existing regional entities to address transportation needs of regional significance;
- Making revisions to the transportation planning process to account for nonrecurring congestion and increase operator involvement;
- Increasing peer exchanges and the dissemination of best practices;
- Improving analytical tools that support consideration of operations strategies in the planning process and show the benefits of operations relative to investments in capital improvement projects; and
- Using nationally accepted performance measures for operations.

**ADVANCING REGIONAL TRANSPORTATION OPERATIONS:
A NATIONAL WORKSHOP**
December 10–12, 2008, Washington, D.C.

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Workshop Overview

In every sector of our economy we see rising consumer expectations as people see what is possible with new technologies and product innovation. Efforts to meet these expectations lead to increased complexity, cross-functional systems, and institutional relationships that transcend individual organizations or traditional functional boundaries. We see this in health care, education, homeland security, public safety, energy distribution, financial systems, and global supply chains. Similarly, increased demand on the transportation network and growing service expectations coupled with competition for funds, time, and access to land is shifting emphasis toward operating the existing infrastructure seamlessly across modes and jurisdictional boundaries in order to improve system performance and reliability, use limited resources efficiently, and respond effectively to customer demands for better service.

The complexity of operating our transportation system is particularly apparent in metropolitan regions, where numerous jurisdictions, agencies, and service providers are responsible for operating various aspects of the transportation system safely and efficiently. Cooperating among these entities can help the traveling public realize reduced congestion, better travel information, improved response to incidents and emergencies, and secure delivery of goods and services. While each agency's foremost mission is to execute its individual function well, many transportation-related functions in metropolitan regions cross agency and jurisdictional boundaries and could be coordinated on a regional basis. For example, these regional operations activities may include traffic incident management, planned special events, emergency management, communications networks, traveler information services, response to weather events, and electronic payment services. Regional approaches to these and other transportation operations activities can be effective and truly benefit the customer.

TRB's Regional Transportation Systems Management and Operations (RTSMO) Committee convened the National Workshop to Advance Regional Transportation Operations, December 10–12, 2008, in Washington, D.C. The purpose of the workshop was to advance the state of the practice in regional approaches to managing and operating the transportation system in a multiagency, multimodal, and cross-functional manner with the goal of improving system performance and reliability, using limited resources more efficiently, and responding effectively to customer demands for better service. This document is a summary of this workshop as prepared by two workshop rapporteurs.

Transportation systems management and operations (TMS&O) is defined in *Transportation Research Circular E-C133, Glossary of Regional Transportation Systems Management and Operations Terms* as: "An integrated program to optimize the performance of existing infrastructure through the implementation of systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of the transportation system." Seventy-four leaders in TSM&O convened to identify ways to advance regional transportation operations and improve regional transportation system performance. Well over half of the participants came from regional entities, such as metropolitan planning organizations (MPOs), and from state agencies, such as transportation departments or law enforcement agencies. The participants represented jurisdictions from across the United States and Ontario, Canada. The workshop was sponsored by the TRB RTSMO Committee and FHWA in cooperation with the National Traffic Incident Management Coalition (NTIMC).

Walter Kraft, chair of TRB committee, welcomed the participants to the workshop and explained that the workshop was designed to achieve the following objectives:

- Identify and document the opportunities, challenges, and benefits of various regional approaches to the operation of our transportation systems;
- Formulate and document new and innovative approaches to, programs for, and models of regional operations that can be advanced to local, regional, and state agencies, including those involved with planning, traffic engineering, transit, public safety, planned special events, and emergency preparedness; and
- Formulate and document suggestions for research and potential strategies that will enable federal, state, and local agencies to advance the concepts and practices developed at the National Workshop to actual practice.

The workshop furthers the goals of the RTSMO Committee to share regional approaches to transportation problems by identifying research opportunities, creating knowledge, and disseminating information on transportation systems management and operations in a regional context. Kraft highlighted the importance of this workshop given the current economic crisis. He emphasized the need to be able to do more by working together and with fewer resources. That means still delivering essential services and getting the most out of our limited infrastructure through effective regional operations, including collaborating among agencies to focus our efforts, effectively utilizing limited resources, and avoiding duplication. Kraft ended his introductory remarks by thanking Wayne Berman, FHWA Office of Operations, who championed this workshop and carefully guided its development from the beginning.

The National Workshop to Advance Regional Transportation Operations was organized around three fundamental and interrelated aspects of regional transportation operations. These three aspects (see figure, below) move transportation systems management and operations from concept to reality by focusing on the essential elements for improving transportation system performance. These aspects are “Answering the Who, What, and How of Regional Operations,” “Making Regional Operations a Reality,” and “Monitoring Performance to Gauge Success.” The boundaries between the three aspects of regional operations are blurred, and at times may blend together, but they were used to organize participants’ thinking about the topics. These three aspects are explained in greater detail in the sections that follow.



The three related aspects of regional transportation operations that were the focus of the workshop.

Making the Case for a Regional Approach

Regional transportation operations represents an integrated program to improve transportation system efficiency, safety, and reliability through the implementation of strategies that cross jurisdictional and agency boundaries and often involve multiple modes. One of the first questions that the workshop participants addressed is “Why is a regional approach to operations necessary?” Why is collaboration across jurisdictional, agency, and modal boundaries critical to optimizing the performance of the transportation system in terms of efficiency, reliability, and safety?

“Making the Case for a Regional Approach” was the focus of introductory remarks made by a panel composed of Robert Arnold, FHWA Director of the Office of Transportation Operations; Brian Rowback, Regional Director for Region 1, New York State Department of Transportation (NYSDOT); Henry DeVries, New York State Police; and Matthew Edelman, Executive Director of TRANSCOM. Panel members also added insights into one of the overall questions of the workshop regarding critical elements to consider in building an approach for regional operations. The panelists offered comments from federal, state, regional, and public safety perspectives, stimulating the participants’ thinking for the remainder of the workshop, where participants developed models for how to advance a regional approach.



Regional transportation operations work to improve the performance of the transportation system across agency, jurisdictional, and often modal boundaries.

(Photo: surpasspro, Fotolia.com)

Arnold emphasized the need to keep in mind the customers' needs. The public wants the lowest reasonable cost and a reliable product. Regional operations professionals must take into account that customers may not be aware that there are tools or technologies that they need to improve their travel. Arnold challenged regional operations professionals to put an emphasis on greater innovation and anticipating the needs of our customers, as has been done in the private sector.

Rowback explained that the importance of regional operations is never clearer to transportation operators than when the transportation system comes to a halt because of a major weather event. Western New York found that working together as a region was critical during a weather emergency and decisions such as opening and closing roads needed to be made based on information from around the region. Rowback emphasized that everyone needed to be looking at complete and consistent information in order to make potentially life-or-death decisions. Because of that eye-opening event, operations in western New York is now all about information. In New York, the critical nature of being prepared for emergencies has brought a variety of people to the table to collaborate.

Rowback stressed that in regional operations, system operators need to go beyond the focus on freeways. As they are finding in New York, the significance of arterials is greater than just their availability as an alternate route during emergencies. Arterials are important as "economic driveways....They take us to where we shop and where we work." He added that regional operations stakeholders, practitioners, and decision makers also need to gain a better understanding of what it means to manage lanes using high occupancy-toll lanes and other revenue-generating systems. It is also necessary to appreciate and understand how to move people and freight, not just cars and trucks, he said. Rowback recommended that this kind of approach needs to be introduced at each MPO even though it may be counter to the focus on projects and traditional processes.

DeVries spoke about effective approaches for advancing regional operations in the area of traffic incident management. According to DeVries, goals and objectives for regional operations are similar between the various participating groups: towing, police, department of transportation (DOT), fire and emergency management services (EMS) and others. One of the best tools for using a regional approach for operations is a traffic incident management (TIM) team. This collaborative framework ties all of the necessary incident management participants together and creates an important awareness among the participants of the issues that are significant to their fellow team members. Many TIM teams are formed following an after-action review, where all of the players in a major incident come together to discuss what happened and how the response could have been improved. The teams help public safety responders and transportation practitioners understand how their work overlaps and where there are opportunities for successful coordination.

DeVries has found that public safety agencies have a tight budget, so many areas use DOT projects for traffic incident management. Homeland security is an area where funding for TIM may be possible because of the significant overlap. Through his work with TIM teams, DeVries has seen many champions arise. He noted that every TIM team has a significant personality that serves as a regional champion. The Southern Traffic Incident Exchange provides a good example of organizing for TIM across jurisdictional boundaries, according to DeVries. The members developed a concept of operations for information sharing centered at the Atlanta transportation management center upon learning that cross-border knowledge exchange is vital for successful regional operations.

Edelman shared insights on what he has learned about overcoming obstacles in the New York area to achieve regional operations in light of multiple jurisdictions. He expressed the need to recognize the conflicting realities of an economic or transportation region and a legal, jurisdictional, or financial region. The regions in which we travel and live in an economic sense are fragmented by jurisdictions, and this is a reality that must be dealt with when advancing regional operations. According to Edelman, independent jurisdictions may be the enemy of regional idealism, but at TRANSCOM they are its constituents, and they need to be persuaded to work on a regional level. State DOTs and elected officials are motivated by the needs of their jurisdictions and not their regions. So, the question remains, “How do you make the case for regional operations?” Edelman argued that self-interest needs to be integrated with regionalism. In New York, agencies realized that if they don’t coordinate, it will cause problems for their jurisdiction. This understanding led to the creation of TRANSCOM. Agencies realized that they had a “regional self” that needed attention.

Finally, Edelman emphasized that “no one is in charge” but that is not a reason to give up. The issue can be dealt with and progress can be made with people acting locally but coordinating on a regional level. Regional operations require tolerating chaos and ambiguity and getting things done anyway.



**Matt Edelman, TRANSCOM Executive Director,
addresses workshop participants.**

Answering the Who, What, and How of Regional Operations

Regional operations begins with a vision for how an area's transportation system can operate to meet the needs of travelers, employers, shippers, businesses, neighborhoods, and residents, without regard to jurisdictional and agency boundaries. To realize this vision, transportation operators, planners, and their partners should organize and develop the institutional mechanisms for establishing objectives, developing plans, obtaining and allocating resources, implementing initiatives, and monitoring progress.

Typically, participants are motivated to organize for regional operations by recognizing regional needs, expressed through regional transportation plans; through the leadership of elected and senior appointed officials; or through the grassroots initiatives of individuals within operating agencies who want to improve the way they deliver services throughout the region.

The Hampton Roads, Virginia, region has a history of interagency collaboration to improve regional operations that dates back to the early 1990s, when a small group of local operators and traffic engineers came together under the guidance of the Hampton Roads MPO. Regional operations in this area have gained strength over the years and now include a strong public safety component and TIM focus. Three leaders of the Hampton Roads effort offered their perspectives on the approaches used to build and maintain a regional effort for advancing regional operations.

HAMPTON ROADS

Camelia Ravanbakht

Camelia Ravanbakht, Deputy Executive Director at the Hampton Roads MPO, remembered that “many years ago, with the introduction of the Intermodal Surface Transportation Efficiency Act of 1991, some traffic engineers said ‘we really need to get together and exchange phone numbers’.” The engineers from different jurisdictions in the region were relying on the MPO to connect them to their counterparts within the region on an as-needed basis and realized that they really needed to start coordinating more directly. Because the engineers in the region had historically looked to the MPO for coordination, the MPO was the natural host in Hampton Roads for the working group that began with the exchange of phone numbers. The MPO led the formation of an intelligent transportation system (ITS) working group with all of the traffic engineers in the area. Two of the traffic engineers decided to apply for an FHWA grant to develop an ITS strategic plan for the region. That plan would form the foundation for moving forward with the regional effort.

After several years, the group recognized TIM as a crucial aspect of improving regional operations and began an effort to encourage the participation of public safety professionals. One approach that they used was to get on the agendas of the public safety meetings and talk to police, fire, EMS, and others about coordinating with transportation entities. According to the panelists, it took about 2 to 3 years to get the attention of the public safety entities and begin working together. Now Ravanbakht has found that the public safety professionals are eager to work with transportation professionals and are interested and involved with their work in the region. By having public safety at the table, the transportation operators and planners now believe they are having even greater success in making an impact in the region.



**Traffic incident response in Hampton Roads, Virginia.
(Photo: Virginia DOT)**

One of the challenges that the group faced was in getting the attention of elected officials in the region. According to the panelists, that changed when an MPO board member was stuck for hours in congestion due to an incident. The MPO board asked the MPO staff to start coordinating and cooperating with all of the agencies in the region to improve incident management. This led to the development of a regional concept for transportation operations (RCTO) with a focus on improving TIM within a 3- to 5-year period. Ravanbakht noted that a shorter timeframe was important because the public does not want to wait 20 years for improvement. The RCTO development process built the required consensus among all of the key stakeholders on specific goals and strategies for advancing incident management. Participants committed resources and the group was able to develop a vision that will be passed on and live beyond the current individuals.

Stephany Hanshaw

Stephany Hanshaw, Facility Manager, Hampton Roads Smart Traffic Center, Virginia DOT (VDOT), illustrated the difference between “buy-in” and “commitment” by comparing the contributions of the chicken and the pig to a ham-and-egg breakfast. Through the RCTO, they are creating commitment and not just buy-in among stakeholders to help the region meet those goals. Hanshaw also noted that VDOT made operations and emergency response a priority on a regional basis, and that has allowed VDOT staff to play a prominent role in the regional collaborative effort in Hampton Roads. A benefit of the RCTO, according to Hanshaw, is that it helps the region to meet increasing demand by making better use of its roadways and other means of transportation. VDOT has a full-time staff member dedicated to analyzing the performance data related to the RCTO and developing reports on a quarterly basis.

Lieutenant Scott Fee

Lieutenant Scott Fee, a Virginia State Police officer and a native of the region, reported that the Virginia State Police saw “the need to partner up with the other entities because we just didn’t have everything we needed to address problems” that were exacerbated by a network of bridges and tunnels. The need to prepare for hurricane evacuations makes it particularly important for police to work with traffic professionals and other partners, he noted. Fee expressed the importance of using public opinion to help guide the working group’s efforts. One of the group’s successes has been getting support from local officials for higher penalties and increased education about truck height restrictions in tunnels.

A city of Norfolk, Virginia, engineer who has been a long-time participant in the Hampton Roads working group was also in attendance at the workshop. She brought up the significant and unique challenges that are faced by local agencies in regional operations. The cities are generally the implementers as they build roads and operate the signals. They are responsible for making their citizens happy, but in turn must also satisfy the state and federal agencies to get funding. The engineer reported that it is difficult to coordinate between cities as each city has its own rules and regulations. These hurdles are different than the ones at the state and regional level, but they must be dealt with in order to successfully advance operations on a regional level.

APPROACHES FOR ANSWERING THE WHO, WHAT, AND HOW OF REGIONAL OPERATIONS

Through breakout groups, conversation circles, and panel discussion, the workshop participants discussed approaches for answering the “who, what, and how” of regional operations. A sampling of the suggestions given by individuals follows.

- **Leverage-Related Issues Such as the Economy, Environment, and Public Health to Advance Regional Operations**

Individuals at the workshop mentioned that advancing regional operations successfully requires leveraging larger issues such as climate change, the stimulus package, fuel prices, the economy, and public health. As Mark Norman of TRB stated, “we cannot pursue the regional operations agenda in isolation.” Stakeholders need to establish the relevancy of regional operations to current hot-button issues and leverage that relevancy to become an integrated and necessary part of solutions in areas such as the economy, the environment, and homeland security. Throughout the workshop, several examples and potential opportunities were shared for motivating or funding regional operations by highlighting the interdependencies between improved regional operations and high-profile public issues.

Economic development, currently one of the greatest concerns in the United States, is significantly impacted by the ability to move freight quickly and safely. Kansas City SmartPort works to attract freight and businesses to the Kansas City region in part through improving freight mobility. Another workshop participant found that the American Trucking Associations has been very supportive of regional operations efforts to improve incident management because



Workshop participants during a small group exercise.

the association wants to make sure that its members can move their freight as quickly as possible after an incident. For example, Washington State suffered a huge catastrophe and had to shut down Interstate 5 for days. An economic study was done afterwards in the region and found that many millions were lost as a result of the highway closure. While the area suffered financially, one benefit of the incident was increased momentum for a regional operations initiative within the state to help notify freight carriers and other travelers early enough that they can avoid the area in the event of a major incident. This momentum resulted in area operators putting together a plan for improving coordination and information dissemination during major events.

One workshop attendee noted that climate change is a hot topic, but environmental stakeholders often view regional transportation operations in opposition to their agenda. That is something that regional operations proponents need to change, the attendee said. One way to do that is by demonstrating the benefits of operational improvements to air quality, according to a workshop participant. The city of Portland recently received approximately \$500,000 to improve transportation operations in the city. This was because the city conducted an air quality and carbon analysis following a corridor signal retiming project. A workshop participant suggested that transportation departments might look into selling carbon credits to fund operations improvements.

Homeland security is another topic of national concern that frequently requires effective regional operations. The Metropolitan Area Transportation Operations Coordination (MATOC) group in the National Capital Region was initiated in part for reasons of homeland security. The Washington Metropolitan Council of Governments saw the need to improve regional operations following the attack of September 11, 2001 (9/11), on the Pentagon. This led to the development and funding of a regional operations organization to facilitate the coordination of agencies during



Regional operations can be advanced by leveraging larger issues such as climate change. (Photo: DX, Fotolia.com)

an incident or emergency. Homeland security initiatives are designed so that regions can respond to disasters, but if agencies in the region have not practiced with the new equipment and systems, these tools may not be used effectively when most needed. One participant noted that regional operations can benefit if localities put systems in place for use on a day-to-day basis so that they can be relied on during security emergencies. In Washington State, the state patrol uses a plane acquired for improved safety and security every day during peak periods to find incidents on the roads and chase down high-speed autos. The plane can communicate to the DOT, fire, ambulance, and others. It is the perfect resource for when an earthquake occurs or a bridge falls down.

The Transportation Commissioner of Washington State recommended during the workshop that regional operations practitioners document the effects of gas price increases as well as other changing circumstances on transportation operations so that policy makers have information that will allow them to create more effective policies surrounding operations.

A workshop participant from the Ontario, Canada, Ministry of Transport related that transportation received funding from a government health department to improve road safety in part because car insurance is offered through the government. The participant reported that the government recognizes that it has a financial interest in decreasing traffic incidents and likewise, car insurance companies in the United States have an interest in improving road safety. The participant suggested that regional operations champions in the United States might look to the insurance industry for support and possible funding because of this connection.

- **Bring Together Regional Transportation Operations Participants by Showing How They Will Benefit and How They Can Add Value**

Matt Edelman of TRANSCOM emphasized that self-interest needs to be integrated with regionalism. In New York, agencies realized that by not coordinating on road construction and rehabilitation projects, they were experiencing substantial congestion in their own jurisdictions due to parallel roadways being shut down or restricted due to road work. This understanding led to regional collaboration and the development of TRANSCOM.

Likewise in Hampton Roads, Virginia public safety organizations teamed up with the existing ITS–operations working group of local and state transportation operators and planners because they realized that they needed the coordination and support of transportation staff to address incident and emergency management issues in the region.

According to the president of Kansas City SmartPort, a regional economic development organization, the organization has been successful in attracting investments from both private and public members because they see the benefits of participation, which are described in the next section.

One workshop participant suggested that, for agencies that cannot contribute dollars to a regional operations effort, leaders might consider the valuable in-kind services that those agencies can offer. For example, law enforcement officers are often able to communicate well with the public and can be used to increase public awareness and support for the effort. Additionally, a workshop participant suggested that there could be an increased opportunity for funding in the metropolitan transportation planning process if the project or program is regional in nature. This increased access to regional funds has helped to motivate and sustain regional operations efforts in areas such as Hampton Roads.

- **Bring Public Safety to the Table by Illustrating the Value of Collaborating with Transportation Professionals**

Southeast Michigan found that there were two important ways to bring public safety representatives to an ongoing regional operations effort. First, the Michigan DOT sponsored a responder safety workshop that drew approximately 30 to 40 individuals. Secondly, the DOT offers traffic video feeds to responders.

A workshop participant suggested that transportation operators and planners can contribute value to public safety professionals through developing a “Transportation 101” course for first responders to help them understand the principles of traffic flow and the impacts of lane closures. In one region, a public safety representative requested this type of course from the MPO.

- **Meet Customer Needs Through Close Collaboration Between Transit and Operators of Highways and Arterials**

Mark Miller, a workshop panelist from the Washington Metropolitan Area Transit Authority (WMATA), emphasized the need for highway and transit agencies to be “joined at the hip” when it comes to operations, and he is working through MATOC to facilitate that relationship. Many travelers in the Washington metropolitan area do not travel exclusively on the rails or the roads, but use a combination of the two. So, according to Miller, customers of Washington area

highways are also customers of transit, and it is important to provide them with traveler information for both transit and highways. A bus is a user of the highways and drivers need to know what is happening on the roads so they can respond effectively to incidents and other problems. Traffic information dissemination to transit providers is a big challenge for all operators. Transit and highway operators could work together to solve common problems more effectively.

- **There Is No Single Model for a Regional Operations Organization for All Contexts**

Workshop participants discussed a variety of approaches to structuring regional operations that they believed could have value. Building from existing structures, relationships, and local best practices was emphasized. The MPO and the state DOT were both proposed as hosting agencies for a regional operations effort, but participants noted that the selection of host should be sensitive to the local culture and capabilities of the regional agencies. Because the engineers in the region had historically looked to the MPO for coordination, the MPO was the natural host in Hampton Roads. If the MPO hosts, one workshop participant suggested that the technological capabilities of the group be hosted by the state DOT. No matter which organization hosts, a workshop participant added that the MPO should be involved. Additionally, individuals participating at the collaborative table need to be able to speak for the agency they represent.

A two-tier structure was also proposed as an effective way to structure a regional operations effort. One tier contains the core agencies that are required to make the regional operations effort happen. The other tier is composed of stakeholders who need to have input on the effort.



Workshop participants make connections across organizations.

Another structure proposed by a workshop participant consists of a high-level decision maker committee from which small task groups are formed to develop products for vetting by the parent committee. Workshop panelists from Hampton Roads reported that establishing smaller working groups around a need with the stakeholders that are most impacted had been very effective in gaining commitment and agreement on common efforts.

The workshop attendees discussed the importance of balancing the need to have a small, fast-acting regional operations group with the need to involve all stakeholders that could potentially add value to the effort. As one speaker noted, the complexity of making decisions and working together increases exponentially with the number of participants. As noted, several regional operations organizations start with a core group of stakeholders to get the structure and collaborative process in place and then add participants and expand scope.

While some workshop participants highlighted the need for regional operations to be institutionalized for greater success over the long term, other participants expressed the view that regional operations could be successful as an informal group. In Southeast Michigan, the regional operations participants have successfully worked together informally using a memorandum of understanding.

- **Develop an Agreed-Upon Vision, Mission, Objectives, and Strategy to Move a Collaborative Effort Forward**

When asked what transportation professionals and stakeholders need to make regional operations a reality, the immediate response from one of the workshop attendees was “a plan.” In the discussions among workshop attendees and examples shared by panelists, a plan or strategy that lays out a common vision, mission, set of objectives, and strategy was a common theme.

TIM practitioners who work together regionally were encouraged by one participant to adopt the National Unified Goal, a set of objectives with a series of general strategies. Through the National Unified Goal, incident responders have committed to responder safety and quick clearance through implementing 18 strategies, as one workshop participant reported.

Hampton Roads’ regional operations collaborative efforts have been guided by documented strategies or plans. Initially, the development of an ITS strategic plan sponsored by FHWA provided the foundation for the group, which later expanded to include public safety issues and developed a regional concept for transportation operations on TIM. The RCTO development required building consensus among all key stakeholders on specific goals and strategies for advancing incident management in Hampton Roads. Participants committed resources and the group was able to develop a vision that will be passed on and live beyond the current collaborative participants. Through the RCTO, participants are creating a commitment among stakeholders to help the region meet its goals.

Faisal Saleem, ITS Supervisor and AZTech Project Manager, Maricopa County DOT, reported that the Maricopa Association of Governments (MAG) and AZTech, a regional operations organization in the Phoenix metropolitan area, has had success in advancing regional operations through the use of an RCTO as well. In 2003, the MAG ITS Committee developed an RCTO that defined goals, specific objectives, performance measures, and 11 initiatives. Most of the initiatives were handed off to AZTech to implement. One objective was to increase the collection and dissemination of information by 100% within 3 years. A working group within AZTech took that charge, prepared a performance measurement plan, and meets every month. The working group identified a project needed to achieve the objective and then proposed the

project to MAG during its annual planning process. They received funding for the project and the Arizona DOT and the Maricopa County DOT jointly with the other local agencies implemented the projects to collectively achieve the objective.

- **Form a Collaborative Attitude Among Participants**

In Hampton Roads, one of the key insights that helped transportation and public safety professionals move forward together on TIM, according to Stephany Hanshaw of VDOT, was that the groups do not have competing objectives, but in fact, they all want safety first and operational efficiencies second. Lt. Fee also noted that it is understood among the Hampton Roads stakeholders that egos are checked at the door during meetings. They also find it effective to emphasize that if they work together they will have better access to regional funds.

Making Regional Operations a Reality

Regional transportation systems operations become a reality when plans and strategies for improving the performance of the regional transportation system are implemented, often through projects and programs that require regional entities to work together effectively. TSM&O projects and programs must first be implemented and then sustained through day-to-day attention. Initial implementation often includes acquiring funding, developing interagency agreements, designing or purchasing hardware and software, training staff, and establishing operating standards and protocols. Implementation may involve regional transportation planning agencies, local governing bodies, and elected officials in addition to leadership in participating agencies.

Equally important is the ongoing commitment needed to sustain management and operating strategies to improve transportation system performance in the region. Most infrastructure investments require periodic preventative or restorative maintenance—as do some TSM&O projects. However, management and operations strategies require day-to-day attention since they tend to be dynamic in nature and respond to current and anticipated conditions. As a result, management and operations strategies are often 24-hours-per-day, 7-days-per-week services that require constant oversight for them to be effective. For example, traveler information systems depend on collection, analysis, and dissemination of timely, accurate, useful, and accessible information about the current and anticipated condition of transportation facilities and equipment. Similarly, TIM requires surveillance, communications, response, and traveler information whenever and wherever incidents occur.

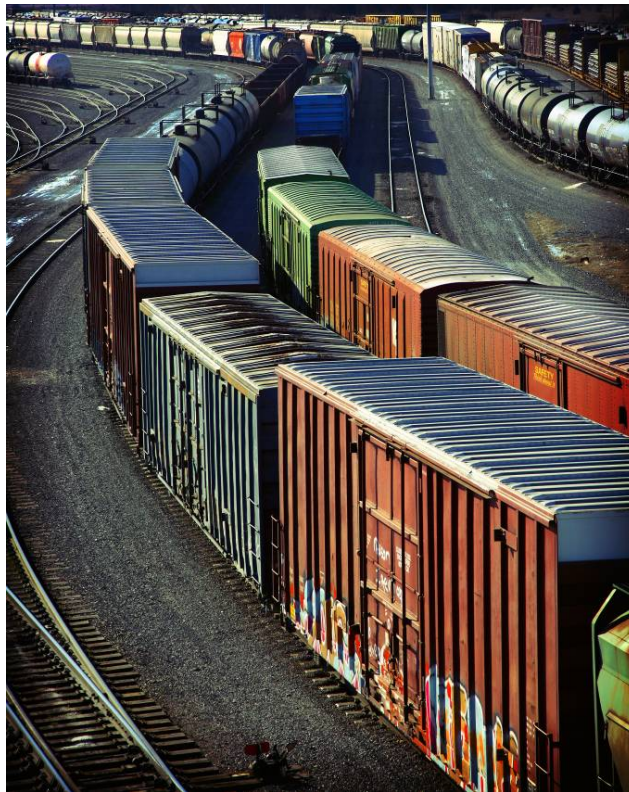


Panelists discuss implementing regional operations initiatives.

A panel of regional operations leaders was charged with helping workshop participants think through the “essentials” of implementing regional operations strategies that achieve regionally significant objectives. Members of the panel were as follows:

- Chris Gutierrez, President, Kansas City SmartPort, Inc.;
- Richard Steeg, Northern Virginia Regional Operations Director for VDOT;
- Mark Miller, Operations Emergency Management Coordinator, WMATA;
- T. J. Nedrow, WSDOT and Chair, Washington Traffic Incident Management Coalition; and
- Faisal Saleem, ITS Supervisor and AZTech Project Manager, Maricopa County DOT.

Gutierrez illustrated the connection between regional economic development and improved regional operations. KC SmartPort is a not-for-profit regional economic development organization funded by both private- and public-sector members, including both the Kansas and Missouri DOTs. In an effort to attract freight to the region, KC SmartPort and its members worked to improve the inter-jurisdictional movement of freight within and through the region. The organization was founded in 2001 after a freight study indicated the need to form a single organization to grow the freight industry in the two-state Kansas City region. KC SmartPort is also looking to connect to Kansas City Scout, a freeway management system provided by the Kansas and Missouri DOTs. KC SmartPort has succeeded in attracting additional freight to the



Public agency collaboration with the freight community has advanced regional operations in Kansas City. (Photo: Rick Sargeant, Fotolia.com)

region as evidenced by a significant increase in retail distribution centers in the area. Both public- and private-sector organizations invest in KC SmartPort because they see the benefits. Public agencies benefit by sitting at the table with the private freight community to better understand and manage traffic on the roadways. The private sector invests in the organization because it provides business opportunities through connections to new businesses in the area.

Stegg described how, after years of ad hoc event-driven collaboration, the transportation agencies of the national capital region formed an interagency regional operations organization to better manage transportation incidents and events. The MATOC program, still in its infancy, is guided by a memorandum of understanding (MOU) signed by each of the participating agencies—the Maryland State Highway Administration, VDOT, the District of Columbia DOT, and WMATA. The MATOC grew out of efforts following the terrorist attack on the Pentagon on 9/11. Following that event the MPO in the region saw the need to bring together the agencies for a more coordinated approach to managing transportation incidents. In 2005, the transportation agencies worked with the U.S. DOT to develop a concept of operations. The goals of MATOC include strengthening multiagency coordination during incidents, improving data sharing systems to aid incident management, and improving information dissemination to the public, emergency management, and public safety agencies (see www.mwcog.org/clrp/elements/moits/coordination.asp).

An earmark of \$2 million was provided to develop the interagency organization. Stegg noted that the process of getting started was difficult, but the organization has recently been stood up and it is seen as something that has “huge potential” in the region. As part of the start-up phase, it took time for the agencies to craft an MOU and get it signed by all of the parties. Currently, they are working through issues of protocol, staff, center location, and management.

Miller discussed transit’s role in advancing regional operations in the national capital region. WMATA is a regional operations success story in that it was created in the mid-1960s through a compact signed by the states of Virginia and Maryland, the District of Columbia, and the federal government. This may provide a model for the creation of other regional operating agencies that need to move beyond the barriers and boundaries that separate jurisdictions. About 3 years ago, Miller’s boss expressed concern that agencies in the region were not adequately coordinating, particularly on incident response, and asked him to lead an initiative to improve coordination. This required Miller to coordinate both internally within WMATA and among the other agencies. Miller is working through MATOC to facilitate the relationship between transit and highways in the Washington, D.C., region.

Nedrow emphasized the need to communicate effectively both between incident responders and with the public. Through the National Unified Goal, incident responders have committed to responder safety and quick clearance through implementing 18 strategies, 12 of which involve communications. According to Nedrow, regional operations professionals need to communicate succinctly to the appropriate people and use good data.

As a transit liaison from the WSDOT, although transit agencies are often not at the “regional table,” Nedrow sees the value of transit and how it can be used to advance day-to-day operations and responses to unplanned events. Transit and highway professionals need to understand each other’s needs and see where they can provide value to each other.

In bringing participants such as fire departments, transit authorities, and police departments to the table, Nedrow shared that “people don’t care as to what you know until they know you care.” Traditional participants at the regional operations table need to effectively communicate to other stakeholders why it is important that they join the effort.

Saleem described the effective approaches taken by AZTech to implement regional transportation operations initiatives. AZTech is a partnership of federal, state, local, and private entities led by the Maricopa County DOT and Arizona DOT to address a variety of regional operations issues in the Phoenix metropolitan area. AZTech began in 1996 with the goal of integrating local systems owned and operated by local agencies. One of the first products of the effort was a center-to-center system that enabled local agencies to share and control camera views between management centers, a crucial capability when managing incidents. Agencies also exchange traffic plans and traveler information on a real-time basis. As part of this initiative, AZTech members had to define regional guidelines to provide a framework for sharing information regionally.

AZTech found that smaller agencies lacked the resources, staff, and systems for some of the regional operations initiatives that the group pursued. The larger agencies, such as Maricopa County DOT, were able to operate signal systems for the smaller agencies and to provide them with expertise and information. Another significant benefit of the AZTech partnership was the use of regional procurement contracts. There are an estimated 17 regional procurement contracts established that expedite procurement of goods and services for agencies in the region. The region collectively saved about \$900,000 through joint procurement for a camera control system.



Local agencies in the Phoenix metropolitan area advance regional operations by sharing control of traffic cameras.
(Source: Niagara International Transportation Technology Coalition)

The group has also been successful in collaborating with agencies that traditionally had not participated in AZTech activities. AZTech joined forces with the Phoenix Sky Harbor International Airport to install and operate a traveler information kiosk. Additionally, AZTech partners have worked closely with public safety agencies to receive real-time computer-assisted drafting information from the Phoenix fire department and the Arizona Department of Public Safety. Currently, AZTech is working to provide public safety agencies with traffic videos over the Internet.

Saleem noted that an ITS corridor project was successful because operators were engaged early in the planning phase of the project and the involvement continued through the design phase. The AZTech partners developed a very detailed concept of operations for the corridor that defined ownership, repair responsibilities, communications, message formats, and incident management. AZTech conducted a before-and-after study of the ITS corridor and found significant travel time savings. The benefits were highlighted in a video that was taken to the public and elected officials to gain support.

Saleem added that AZTech's success depended on the trust developed between the partners that allowed them to deliver successful products that enable regional operations.

APPROACHES FOR MAKING REGIONAL OPERATIONS A REALITY

Through breakout groups, conversation circles, and panel discussion, the workshop participants discussed approaches for making regional operations a reality. A compilation of suggestions made by individual participants is below.

- **Utilize Regular Self-Assessments or Audits to Keep the Effort on Track and Gain Awareness of the Need for New Actions**

Workshop participants discussed using self-assessments on a regular basis as an important approach for motivating regional operations efforts and keeping them on track. The traffic incident management self-assessment and the traffic signal self-assessment were mentioned specifically as being useful. A collaborative group in Maryland uses the TIM self-assessment and has initiated operations improvements as a result. Other participants expanded this discussion to leveraging audits to force change. A suggestion was made for FHWA to participate in in-person regional operations assessments. Another participant indicated the need for regional operations groups to regularly re-evaluate whether everyone who needs to be at the table is present and whether everyone who is there still needs to be.

- **Keep Up the Momentum for Quick Results**

A prevailing theme in discussions on effective approaches to working collaboratively for regional operations was maintaining an energetic momentum and developing results quickly. One of the tenets of advancing regional operations is to move from reactive traffic management to a proactive operation that anticipates user needs and prevents transportation problems. One suggestion from a workshop attendee was that regional operations groups adopt a process that enables them to move efficiently to take action and produce results. Maintaining the momentum

of the collaborative effort is also key to sustaining the commitment of participants and finding an effective direction for the effort. As one participant noted, “you can’t steer the bus if it’s not moving.”

The collaborative effort, IN TIME, the Indiana TIM Effort, illustrated the effective use of this principle. In Indiana, the Indiana State Police (ISP) took the lead in organizing a regional operations effort aimed at improving TIM. ISP looked at a successful example in Louisiana and decided to spearhead a similar effort. ISP brought on other participants by explaining what they wanted to accomplish (bring quick clearance to Indiana) and how it would be beneficial. The group put together a list of needs and then formed a multilateral working agreement that everyone could sign and that demonstrated buy-in. The superintendent of the ISP played a lead role in getting commitment from other agencies. A police captain facilitates monthly meetings and forms and assigns subcommittees to bring back results within 1 or 2 months. They then move onto new topics. This quick pace has been effective at keeping the interest of the participants and producing results in the short term.

- **Institutionalize Regional Operations Efforts to Withstand Personnel Changes**

One of the greatest challenges brought up during the workshop was maintaining the regional operations effort after the loss of a champion, leader, or participant from a core participating agency. A workshop participant suggested that it is crucial to institutionalize the collaborative effort shortly after formation. Because champions and leadership can change quickly, many viewed this effort of institutionalizing as a race against time. Suggestions for institutionalizing regional operations included developing an RCTO or written agreement signed by key organizations that demonstrated commitment to the effort.



Participants develop approaches for advancing regional traffic incident management.

- **Look to Agency Budgets to Support Ongoing Operations**

Although the collaborative effort such as interagency communications may initially be funded by a federal grant or earmark, some participants observed that the departments of transportation involved in the effort should agree to budgetary provisions for ongoing use and the MPOs should get operations into the transportation improvement plan and long-range plan to maintain the use of the transportation system.

- **Colocate Transportation and Public Safety for Improved Communication**

Participants discussed co-locating transportation departments and public safety for improved communication and coordination in handling an incident. A representative from Las Vegas's MPO, the Regional Transportation Commission (RTC) of Southern Nevada, reported that the Nevada DOT set up a contract that allowed the RTC to set up and maintain an incident management system. The Nevada Highway Patrol is located in the same building as RTC, which allows for efficient communications.

- **Use Awareness and Education for Gaining Public Support**

Advancing regional operations requires gaining support from the public. A workshop participant suggested that regional operations participants need to make improvements in creating awareness among the public for their efforts. Using branding techniques to provide easy recognition among the public of the regional operations efforts was discussed. This could take the form of branding traveler information so that the public knows who is collecting the data even if it is disseminated by media outlets.

RTC provides a traffic video feed to the media, but the media is required to show the logo of the agency with the video.

- **Look to Program Management Expertise and Knowledge to Manage Regional Operations Effectively**

One workshop participant from an economic development organization observed that regional transportation operations participants should step back and view this as program management. The participant noted that the group had touched on all of the aspects of good program management and that advancing regional operations can draw from the lessons and principles of program management in a business context. The seven key items for successful program management given by the participant were: leadership, strategic planning, a customer focus, knowledge management and data collection, workforce development and training, process management and documenting those processes, and a focus on outcomes.

- **Resolve Institutional Disconnects in Regions to Speed Operational Improvements**

Christopher Zimmerman, Member, Arlington County Board, Virginia, spoke at the workshop about his experiences as an elected leader working to manage congestion in the region through advocating for operational improvements. Although Zimmerman notes that there have been many accomplishments in the region, he doesn't think that the region has been able to achieve

nearly as much as it could have because it takes so much time to work through the institutional issues involved.

He cited several examples of relatively simple operations projects with committed funding that took years to implement because no one is really in charge or feels they have the permission to act. In one example, a federal grant was obtained in the region for signal preemption for emergency vehicles and signal prioritization for transit for one major corridor. It was widely agreed to be a good idea, but it took around 10 years to get it partially operating because of institutional issues. As time passed, new questions had to be resolved regarding interoperability between departments and with other systems starting up in the region. Another example involved converting a highway lane on a bridge to a bus-only lane. The complication occurred in part because the Virginia part of the highway ends at the river and part of the bridge span belongs to the District of Columbia, but the effort has not gained traction because no single entity is in charge. Zimmerman stressed that working out the institutional disconnect, particularly between policy makers and individuals responsible for the transportation system, is critical to advancing regional operations.

- **Develop Relationships Between Elected Leaders and Transportation Professionals to Facilitate a Flow of Information on Potential Transportation Solutions**

Zimmerman stated that relationships between decision makers like himself and transportation professionals are “more important than I can express.” Establishing good communication benefits both parties. Elected leaders learn about transportation solutions they should propose and transportation experts get their ideas advanced. Zimmerman highlighted that ideas for potential solutions with information on whether or not they have been tried before are of great value to policymakers. Elected officials also value facts about the situation that prepare them for talking with constituents. He encouraged interaction between decision makers and knowledgeable transportation professionals and for experts to look at the potential for recommending improvements in policies.



Chris Zimmerman, Arlington County Board Member, Virginia, offers insights on advancing regional operations.

Monitoring Performance to Gauge Success

Performance measurement is particularly critical to transportation systems management and operations because of the range of stakeholders and the varying time scales used to support decision making. Planners (and operators who plan for operations) need to predict and measure longer-term trends to see where operations strategies can be implemented to improve system performance. The data that support operations investments come from archived data systems that help pinpoint problem areas (e.g., chokepoints and delays) and, through feedback, track improvements that result from implementing operations strategies (e.g., signal timing plans, TIM plans, improved transit schedules and routes, more accurate traveler information).

Stakeholders involved in day-to-day operations depend on performance data for near-term resource allocation to identify and alleviate recurring problems that result in increasing delays and inefficient use of available capacity. While these decisions may not involve substantial investments, as agencies and jurisdictions share data on system performance, they are better positioned to identify root causes of congestion and work together more effectively to improve performance. These same agencies rely on real-time performance data to maintain an accurate assessment of the current state of the regional transportation system so that they can observe changes in system behavior, anticipate the effects of these changes, and respond appropriately to minimize degradation in system performance.

Finally, monitoring performance is critical to developing the compelling evidence that senior decision makers and elected officials need to make the case to their respective constituencies to gain support for regional operations initiatives. This was a point made repeatedly during the workshop. Whether based on anecdotal stories or long-term trends, these senior officials need solid evidence to support the case for both making the financial investments required to implement operations strategies and crafting the institutional arrangements required by regional strategies that, in some cases, put regional goals above those of individual jurisdictions and agencies.

Performance measurement requires participating agencies to resolve several issues related to data collection, reporting, sharing, and use—for example,

- Determining processes, procedures, and responsibilities for measuring performance;
- Considering how to use real-time and archived data given the differing perspectives of stakeholders;
- Ensuring data validity;
- Considering data sharing opportunities (including ownership and use of data);
- Developing reporting procedures:
 - Who does the reporting?
 - What form does the reporting take?
 - What is reported?
 - Who receives the reports?
- Determining how performance monitoring will support real-time decisionmaking for both operators and travelers; and
- Discussing how the performance information will support the region’s congestion

management process and future investments in both new capacity and management and operations strategies.

Workshop participants and panelists considered these issues as they worked to develop viable approaches for using performance monitoring to advance regional operations. A panel composed of transportation operations practitioners and researchers in the area of performance measurement came together to discuss using performance measurement as a tool to increase support for regional operations and improve the effectiveness of regional operations activities. The panelists were Thomas George, Executive Director, Niagara International Transportation Technology Coalition (NITTEC); Daniela Bremmer, Director of Strategic Assessment Office, WSDOT; Mark Hallenbeck, Director, Washington State Transportation Center; and Tim Lomax, Research Engineer, Texas Transportation Institute (TTI).

George spoke about performance measurements taken by NITTEC to keep the coalition members informed about the status of their ITS and the activities of the coalition related to transportation management. NITTEC is a binational regional operations coalition in the Buffalo, New York, area and southern Ontario, Canada. Transportation in the region is characterized by border crossings and urban traffic and it serves as a trade and tourism corridor. The coalition has staff that runs a traffic management center as a service for the member agencies. It uses member agency ITS equipment to detect and manage traffic and provides a communications hub for agencies.

NITTEC measures the performance of incident management on the region's roads, collects data on freeway and tollway volume and speeds, and tracks the performance of the ITS equipment used by NITTEC. Coalition staff prepare report cards for the member agencies on a monthly basis that contain performance information on the performance of the operations center and the performance of the ITS field systems. It uses standards and performance goals to guide the organization. Additionally, NITTEC collects and uses real-time information on the



The NITTEC traffic management center.
(Source: Niagara International Transportation Technology Coalition)

transportation system to respond with traveler information and notifications to member organizations. NITTEC is striving to document the performance of regional collaboration rather than just system performance.

NITTEC focuses on consistent data collection and reporting. George mentioned that the coalition is looking for a national standard to use. It has studied performance measurement at other organizations and adopts others' practices to improve their approach. "We are great at stealing other peoples' stuff," George joked. He noted that the work at the WSDOT has been very helpful to them. NITTEC would like to discover a platform that it can use to document the benefits and value of the regional system management and operations that it conducts.

One of NITTEC's priorities in measuring performance is to demonstrate its benefit for its "customers," the coalition's member agencies, which include state, city, and county DOTs, public safety, and transit. The coalition wants to measure how well it is providing traveler information to its customers, including assessing the timeliness and consistency of the messages across the region. It would also like to show agencies the benefits of collaboration by illustrating how often neighboring agencies' ITSs are used to manage a situation occurring in another member agency's jurisdiction. This information can be used to provide an incentive for the member agencies and other stakeholders to continue or increase participate in the coalition. NITTEC has developed a robust incident training program, according to George. One of its performance measures is the percentage of first responders in the region who have been trained through NITTEC's incident management program.

Bremmer shared several insights from her work to advance accountability and transportation system performance measurement. WSDOT began a major initiative to improve transparency and gain the public's trust in 2001 when the state's then-new Secretary of Transportation, Doug MacDonald, directed the organization to show performance information to the public within a couple of months. Shortly after, the department began producing a quarterly report on transportation programs and system performance that demonstrates with data how WSDOT projects and programs have mitigated congestion and made other improvements in the transportation system.

Bremmer emphasized the following points:

- Performance measurement and transportation system analysis is difficult and no organization has found a perfect solution—even the WSDOT with all of its work.
- Agencies should focus on getting "their own house in order first" to provide a good foundation for a regional effort, but monitoring regional transportation operations through collaboration with multiple agencies is not insurmountable. It requires an emphasis on compatibility.
- Data are of ultimate importance but effective use requires a clear purpose. Before gathering data, agencies need to be clear on the purpose—traveler information, investment decisions, or managing the system on a day-to-day basis, for example.
- Data will never get better unless they are placed in front of policy makers and the public. Data will never be perfect or comprehensive but require a process of continual improvements.



Daniela Bremmer, WSDOT, discusses performance measures.

- Protect public investments by getting the most out of existing data and collection systems. Agencies need to maximize the investments that have already been made.
- There needs to be a compelling reason to perform system performance measurement as this is not something that can be done “casually.” Agencies or regions should consider what people will expect them to do based on that information. “Someone will hold your feet to the fire to take action on that information,” Bremmer cautioned. An organization or region needs to have a mandate or a crisis such as a natural disaster to propel it forward in performance measurement. Regions should be ready to leverage that for momentum to advance performance measurement. This was the case for WSDOT, when the new secretary of transportation told the department to get performance information out to the public within 2 months. The secretary “pushed them to get the data out” and was willing to take some risks.
- “Operations data put a face on M&O [management and operations],” Bremmer noted. In general, the public does not understand operations. Data personalize operations for the public.
- Data should be used to explain how operations are effective and make a compelling argument for operations instead of merely claiming that operations are important.

Hallenbeck advocated for holding ourselves accountable through incentives and disincentives to make the transportation system work more effectively. He provided the example of making a traffic engineer’s pay based on whether or not that individual makes the roads work better.

“Things don’t operate better because no one gets credit when you make things operate better,” according to Hallenbeck. By collecting data on transportation system performance and the outcomes of operations projects and telling the public and decision makers about it, operators can “get credit” for making improvements. Hallenbeck reported that the good thing about talking about system performance in public is that “suddenly people care.” If the agencies or operators look bad, then suddenly things begin to change.

Hallenbeck also highlighted the importance of collecting data not for its own sake but

because it tells you how to operate. “No one wants to spend money on data collection,” he acknowledged. A well-run business collects data because it gives the leadership the information it needs to make decisions and operate the business effectively. Hallenbeck advocated treating regional transportation system operations in the same way.

Lomax highlighted the need to change the way transportation practitioners “tell the story” of transportation operations to get public support and greater funding. He started out by asking the workshop participants, “How many people think of more VMT [vehicle miles traveled] as serving more customers?” Most businesses readily take credit for serving more customers but that does not seem to happen with highway or arterial operators. Transportation professionals need to focus on communicating more of the benefits to the public and decision makers in addition to the cost. Lomax emphasized that transportation professionals need to talk about “the stuff the people care about,” such as making American businesses and families more productive. He recommended that regional planners and operators talk to the business community to learn about how businesses’ use the transportation network and why effective operations are critical for businesses. Right now, the public sees transportation investments generally as “potholes, asphalt, and guardrails.” According to Lomax, “This is not the public face we should be showing; we should emphasize the services we provide and the economic and societal benefits we support.” The communication strategy that transportation professionals should adopt is similar to the one that would be used if there was no Highway Trust Fund. Transportation professionals would have to be much better at competing with other government programs for funding.

Real integration needs to take place not between arterials, highways, and transit, but between subdivisions, job centers, the economy, and people. Operations allows for that integration to happen. Operations also have a lot of data that is needed to help run the transportation system. With that data, operations can become the public face of transportation.

APPROACHES FOR MONITORING PERFORMANCE TO GAUGE SUCCESS

Through breakout groups, conversation circles, and panel discussion, the workshop participants discussed approaches for monitoring performance to gauge success on a regional level and how to use performance measurement to advance regional operations. A sample of suggestions from individual workshop participants is below.

- **Use Performance Measures to Provide Incentives for Improvements in Operations**

Hallenbeck’s call to use performance measures to incentivize better operations was echoed in some of the experiences shared by other workshop attendees. An attendee reported that a major national organization tracks the response time of its tow trucks and those that do not respond in a timely manner do not get their contracts renewed but those that respond quickly, get a bonus. NITTEC has found that by reporting traffic incident management performance, it has spurred competition among the first responders, creating greater pressure for improved performance.

- **Establish Accountability with the Public and Decision Makers by Reporting Performance—Both the Good and the Bad**

By collecting data and measuring the performance of the organization, both WSDOT and NITTEC were able to instill a sense of accountability with their customers. At WSDOT, Bremmer reported, the benefits of measuring performance outweighed the risks because the organization needed funding. The organization established an accountability effort to demonstrate to the public and elected leaders that WSDOT could use taxpayer money wisely and bring about benefits to the public. After WSDOT began reporting on its performance to the public on a regular basis, it received two revenue increases in 2003 and 2005. Public trust and credibility was established in part, Bremmer stated, because WSDOT was willing to show both favorable and unfavorable results.

NITTEC uses monthly report cards to maintain accountability with its member agencies showing the performance of the common operations center and the performance of the agency's ITS field system. Although the performance measurement program is vital for maintaining accountability, George reported that the credibility of the data is questioned when NITTEC reports information that is unflattering.

- **Create a National Operations Performance Report**

Two panelists reported that the idea of a national operations performance report with broadly accepted measures of operations performance to aid in decision making and communicating with the public would be a good idea. Lomax stated that it would need to have a range of measures for different audiences and different purposes. It would need to have a single page summary, a website, and an opportunity for users to provide their input. Additionally, it would need to have a high level of transparency and accountability.

Hallenbeck cautioned that while it would be beneficial, it would require some trial and error in rolling up local data into a national measure. Multiple measures would be needed to tell the whole story and avoid a skewed understanding of the system.

- **Conduct Before-and-After Studies to Verify Benefits and Justify Investments in Operations**

Two reasons given by individual workshop participants to monitor performance were to provide evidence of the benefits to operational improvements and justify investments. A participant expressed a need for more before-and-after studies because there are still many doubtful policymakers who need data. One participant talked about how, in the Puget Sound region, performance measurement of the high occupancy vehicle system was able to end questioning about the usefulness of the system. Additionally, local elected leaders find this information very important when making investment decisions.

- **Do a Good Job, Have a Plan, and Tell People About It**

Offered by a workshop attendee, these were the three keys to getting more tax dollars that appeared to resonate with workshop attendees—operate the transportation system effectively, measure the success, and communicate these results to others. In addition, having a plan for how

to operate the system on a regional level and measure performance allows operators to leverage a current event or political will toward improving operations and performance measurement.

- **Use Your Local Newspaper to Get the Story Out on Operations**

Workshop attendees mentioned the little-known opportunity to tell the public about transportation operations through the local newspaper or other media outlets. As Hallenbeck mentioned, “If you have data and are willing to talk, they will come to you.”

- **Use Qualitative as Well as Quantitative Performance Measures**

Several attendees discussed the importance of using qualitative measures—nonnumeric descriptions—as well as quantitative measures to characterize the performance of the regional transportation system. Particularly in the case of traveler information, one attendee stated that even if you can quantify it, does not mean that it cannot be reported in a useful way to the public. Oftentimes, performance can be effectively reported to the public without using exact numerical data, instead using categories such as high, medium, and low or through color codes.

A participant from the Utah DOT indicated that it conducts customer satisfaction surveys on traveler information and finds that the benefits of traveler information are frequently qualitative.

- **Move Toward Mode–Agnostic or Mode–Neutral Performance Measures**

One of the themes discussed throughout the workshop was the focus on moving people and goods instead of focusing on improving specific modes. In this vein, an attendee suggested using mode–agnostic or mode–neutral performance measures, which looked at the movement of people or goods without regard for the mode of travel. This may help to focus operations improvements on achieving the outcomes that customers care about.

- **Link Performance Measurement to Regional Goals and Objectives**

The suggestion to connect performance measurement to regional goals and objectives was voiced during the workshop. One participant stated that performance measurement needed to be tied to objectives and not performed in a vacuum. Furthering this idea, another participant suggested that performance measurement should be performed iteratively in the planning process to assess current policy and evaluate the long-range plan’s goals and outcomes.

Opportunities to Advance Regional Operations at a National Level

One of the major objectives of the National Workshop was to formulate and document suggestions for research and potential opportunities to enable federal, state, and local agencies to advance the concepts and approaches developed at the National Workshop into actual practice. Such approaches could include national-level programs designed to authorize and equip agencies and jurisdictions to improve regional transportation operations. It might also come through national-level initiatives implemented through cooperative programs (e.g., the National Cooperative Highway Research Program or the Transit Cooperative Research Program) or national organizations that serve entities that work at the regional level (e.g., Association of Metropolitan Planning Organizations, the NTIMC, or AASHTO) or other bodies that work across agency and jurisdictional boundaries.

Throughout the workshop—panel discussions, breakout groups, conversation circles, invited speakers, and informal interactions—participants related success stories, discussed effective institutional strategies, emphasized important “success factors,” identified key issues, and suggested ways to advance regional operations. One of the threads woven throughout the discussion was national-level strategies that provide the leadership, information, authority, and the compelling case for advancing operations as an effective way to address the nation’s need for safe, reliable, and secure transportation systems. This thread was expanded on in the final activity of the workshop when each participant was asked to submit specific ideas for advancing regional operations, including actions at the national level that could help to advance regional operations.

While the opportunities listed by participants to advance regional transportation at a national level did not fall neatly into easily defined categories, there were major topics where focused attention could prove valuable. These topics include the following:

- Authority and responsibility for pursuing regional strategies;
- Planning processes that accommodate operations initiatives;
- Institutional maturity to sustain regional collaboration;
- Information sharing approaches for best practices in regional operations;
- Effective communications with customers and other constituencies;
- Tools and methods for identifying and evaluating regional approaches;
- High level performance measures for identifying needs and evaluating progress; and
- Self-assessment instruments for identifying obstacles and opportunities.

Opportunities for federal, state, and local agencies to work together at the national level emerged in each of these topic areas.

AUTHORITY AND RESPONSIBILITY FOR PURSUING REGIONAL STRATEGIES

Jurisdictions and agencies typically focus on the needs of their own constituencies and may lack either the authority or the incentive to work toward regional approaches, even if they see value in

doing so. Consequently, they need an “authorizing environment” that stimulates regional strategies for improving transportation operations. One participant commented that “if we address the issue of regional operations incrementally, it will take 20 years. We need revolutionary change. We need a major change from the federal side.” This might include legislative authority to form regional entities or to empower existing regional entities to address transportation needs of regional significance. Another participant called for “a true regional highway or road operating authority capable of making regional decisions.” Another saw the need for “policy legislation within agencies and organizations to set aside money for operations” and a broader “focus on multimodal transportation system optimization through all means.”

One participant observed that the Strategic Highway Safety Plan really changed who was at the table because it was a “thou shall” – i.e., linked to federal requirements and funding. Such an approach for regional operations could help bring other agencies into the process and, hopefully, result in getting more accomplished through regional operations initiatives.

In Arizona, developing their Strategic Highway Safety Plan was very valuable and resulted in cultural change for approaching safety. It resulted in less emphasis on traditional transportation projects and began to reverse the mentality that there must be projects with design, construction, and ribbon-cutting phases. It led to greater acceptance all way up chain of command that they could address these problems without typical infrastructure. The participant from an Arizona MPO suggested that this may be a good approach for regional TSM&O, either statewide or within a metropolitan area.

PLANNING PROCESSES THAT ACCOMMODATE OPERATIONS INITIATIVES

In his closing remarks, the former mayor for the City of Fairfax, Virginia, John Mason, pointed to obstacles in the planning process that discourage investments in operations strategies. He noted that an MPO may allocate millions of dollars to capital investment projects involving



John Mason, former mayor of Fairfax, Virginia, delivers closing remarks.

capacity expansion because of the legal requirement to address nonconformity issues, yet overlook or, at best, allocate only a pittance to operations projects. Other participants observed that an overhaul of the transportation planning process is needed; we only look at recurring congestion and travel demand models, not at nonrecurring congestion which, by some estimates, accounts for nearly half of total delay. Operators—such as first responders—should be engaged in the transportation planning process. This participant states that we are only “looking at half the pie” when we focus on recurring congestion in transportation planning.

There were participants, on the other hand, who felt that the existing planning processes and the MPO structure can get things done without a new mandate.

INSTITUTIONAL MATURITY TO SUSTAIN REGIONAL COLLABORATION

Agencies within jurisdictions often initiate collaboration on issues of regional significance because of a single event such as an incident that gives greater visibility to the need for improvements in regional transportation system performance or, in other cases, the efforts of one or a few individuals whose vision and persistence led to forging multijurisdictional and interagency relationships and agreements that enable them to work together more effectively. While these isolated incidents and visionary individuals may stimulate much needed collaboration to improve operations, they are unlikely to be adequate to sustain the collaboration over the long term.

Workshop luncheon speaker Steve Lockwood, a former FHWA senior manager and currently a consultant with PB Consult, Inc., offered his views on what is needed to gain the institutional maturity associated with a sustained, high-performance organization that transcends individuals and events. Lockwood focused on the concept of “managed change” in which organizations institutionalize a framework for continuous improvement that is built upon proven concepts embedded in the capability maturity model (CMM) associated with the software development process. Lockwood used the CMM framework to identify critical dimensions of the jurisdictions that move from the status quo (20th century) to entities operating within a “21st century operations-oriented region”:

- Mission and vision—from separate priorities in individual jurisdictions to “co-operating” the system;
- Professional orientation—from “optimize my sector” to “multitasking mobility management” (including safety and security);
- Authorizing environment—from expanding responsibilities and shrinking resources to focus on user performance accountability;
- Processes—from ad hoc and unique to shared and standardized;
- Jurisdictional roles—from minimal interaction (mostly informal) to continuous partnering; and
- Drivers of change—from external events to learning-based.

Lockwood explained that federal or national leadership is required to provide examples of how jurisdictions and agencies within jurisdictions can move from the 20th century perspective, which is characterized by 20th century behavior, to those in which the regional perspective has been institutionalized and can be sustained. Lacking this, regionalism will

continue to depend on “heroes” who champion the cause and the occasional high-visibility events (typically negative) that garner greater attention for operations initiatives.

INFORMATION-SHARING APPROACHES FOR BEST PRACTICES IN REGIONAL OPERATIONS

One of the primary benefits of the national workshop is that it offered a forum for the exchange of ideas, experiences, success stories, opportunities, and concerns. Several participants noted that it had been one of the most useful workshops they had attended. They also expressed a strong desire to find ways to share information on a more formal basis, especially those best practices that have proven effective in other regions.

Participants saw the need for sharing best practices as a way to leverage the time and money spent creating products and delivering training. One participant commented that “If all the smart people in this room were a part of every project we would spend a lot less time with projects.” Mechanisms to take advantage of expertise and experience on a broader scale would be useful. Best practices could be documented, consolidated and made available on individual areas of success such as regional incident management, regional transit, regional event planning, etc.

One participant suggested that it would be helpful for a national-level organization to visit states or regions and help conduct self-assessments with senior leaders in DOTs, MPOs, county governments, etc. There are many reports with the best practices and research but they do not always reach the right people.

Another participant noted that, without formal training and knowledge of best practices, we learn on the job and through our failures—our own as well as others’. For example, the observer cited the need for research on the real air quality benefits to signal re-timing compared to current planning models.

Finally, one participant noted that, while we should highlight “current” practices, we should acknowledge that there is no “best” way to accomplish regionalism and each region will have to determine what works best with that region, drawing on the successes of others as appropriate.

EFFECTIVE COMMUNICATIONS WITH CUSTOMERS AND OTHER CONSTITUENCIES

Arlington County Board member Zimmerman’s remarks on the final morning of the workshop emphasized effective communications with both elected officials and their constituencies. Zimmerman challenged participants to develop relationships with elected officials. Part of making the case is having good, informal relationships with elected officials. Elected officials need facts to convince their constituencies that they are making good decisions.

One of the themes for additional work was the need to communicate more effectively to policy makers the benefits of more efficient operation of transportation systems on a regional basis. If it can be shown that better operations can increase capacity, reduce emissions, and reduce or delay the need for capital costs, greater support for operations will likely follow.

Tom Martin, Virginia State Police, added that we often confuse our customers and senior

decision makers by using language that means different things at different times. Words like “region,” “operations,” and even “people” (i.e., which people?) are used in ambiguous ways. Martin’s bottom line was that regional operations depends most on what people do, and the one quality that influences what people do together is mutual trust. According to Martin, “without trust we will never make regional operations a reality.”

Beyond communicating with elected officials and their constituencies, at least one participant recognized the need for better communications within the transportation community—for planners and operators, including law enforcement, first responders, transit operators, and others who influence both investment decisions and day-to-day operations. For example, a national organization can hold “an operations conference of nonbelievers,” bringing in people that really need to be convinced that operations improvement really can make a difference in safety, reliability, and security. Those who are already “believers” can nominate people to attend and bring solid examples of how regional operations have and can work to improve transportation system performance. Workshops might be regional around the country, bringing examples of success from that part of the country in which they are held.

National organizations might extend the peer exchange concept by focusing on DOT and MPO directors with the idea of getting the message to senior decision makers and letting it “trickle down” to others in the organization. Transportation field offices could continue to reinforce that message.

Other suggestions for communicating success stories with the range of stakeholders include

- Webinars;
- Listservs to notify stakeholders of updates and opportunities;
- Harvesting and disseminating information gathered from information clearinghouses;



**Tom Martin, Virginia State Police,
answers questions about communicating effectively.**

- A wiki (i.e., a collaborative website whose content can be edited by anyone who has access to it) used as a self-managed vehicle for keeping information current and accessible;
- Report summaries that make them accessible to busy professionals; and
- Performance measures and related materials.

TOOLS AND METHODS FOR IDENTIFYING AND EVALUATING REGIONAL APPROACHES

Participants focused on research and development to formulate better tools and models that integrate operations strategies into transportation planning and day-to-day operations. Current planning models focus attention on recurring congestion and fail to consider the impact of operations strategies.

In addition to analytical tools that support consideration of operations strategies in the planning process, it was suggested that tools are needed to show the economic benefits of operations strategies relative to major investments in capital intensive projects.

Many operational problems are difficult to reflect in region-wide modeling efforts, and methods and tools could be developed to show how operations strategies can address these problems. According to one participant, until we determine how best to represent operational problems in regionwide modeling efforts, it will be hard to mainstream operations into transportation planning and project development. More joint performance measures and data collection efforts could be encouraged.

HIGH-LEVEL PERFORMANCE MEASURES FOR IDENTIFYING NEEDS AND EVALUATING PROGRESS

One of the sentiments expressed was that if standards exist for the Interstate system—guidance on how it is designed, built, and maintained—why can't there be comparable guidance in terms of how it should be operated and what performance measures should be used to determine how effectively we are managing this critical national resource?

Good performance measures would allow for comparisons between operational improvements and capacity improvements. Other performance measures would allow us to look at reductions in greenhouse gases, etc. Data on how the system is operating; however vital, is of limited value until it is translated into actionable information.

At least one participant felt that performance measures need to be less traffic-centric, less vehicle-centric and more focused on what customers actually experience—i.e., the movement of people and goods—so that efforts can be focused on improving the customer's experience rather than solely on operating and maintaining roads and rails.

A need for research on standard, nationally accepted performance metrics for operations was cited by many participants. These would comprise a few good indicators that accurately indicate the overall health of a region's transportation network, including both quantitative and qualitative measures.

SELF-ASSESSMENT INSTRUMENTS FOR IDENTIFYING OBSTACLES AND OPPORTUNITIES

While related to performance measures, self-assessment instruments help agencies and jurisdictions identify important policy, institutional, and fiscal considerations that can either encourage or hinder advancing regional transportation system management and operations. FHWA and other organizations have developed several self-assessment tools designed to help agencies and jurisdictions identify barriers and opportunities relating to regional collaboration, regional traffic incident management, and other regionally significant activities.

Some participants encouraged national transportation organizations to visit states or regions and help conduct self-assessments with senior leaders in DOTs, MPOs, county governments, etc. In this way the self-assessment is both a diagnostic tool to identify opportunities for improvement and a communications tool to help key stakeholders understand the potential benefits of advancing operations strategies in addressing regional transportation needs.

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