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The National Operations Center of Excellence (NOCoE) Annual Report covers the progress made by the Center in 2015, its inaugural year. Officially launched on January 11, 2015 at the Transportation Research Board's 2015 Annual Meeting, its first year laid the foundation to align its goals, mission, and vision with a robust range of products and services. A partnership of the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), and the Intelligent Transportation Society of America (ITS America) with support from the Federal Highway Administration (FHWA), NOCoE offers a suite of resources to serve the transportation systems management and operations (TSM&O) community. NOCoE has two primary components: an operations focused Technical Services Program, and a web portal, www.transportationops.org.

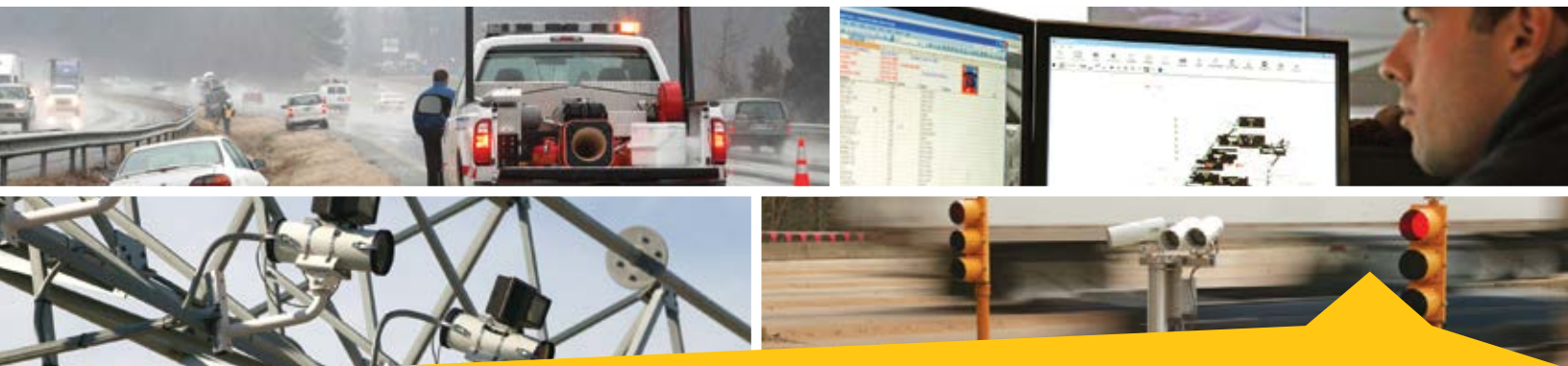
NOCoE can look back on a number of accomplishments in 2015: its successful launch and outreach to the TSM&O community; the effective formation of its Board of Directors and Technical Advisory Committee; the creation of its first Technical Services Plan and Outreach and Engagement Plan; emerging relations with a range of stakeholder groups within the TSM&O community; and the ongoing provision of the core services it committed to. The NOCoE website was consistently able to reach greater and greater new users throughout the year and now contains over 1,000 resources in its online Knowledge Center. This valuable TSM&O resource houses case studies, resources, links to an array of information, discussion forums, and a calendar of TSM&O-related events. Further, NOCoE hosted over 20 virtual webinars and 6 in-person peer-to-peer exchanges in 2015/2016.

In 2016, NOCoE will further expand upon and improve the execution of its website resources and technical services. NOCoE is already moving forward on its first ever national TSM&O Summit (Workforce Development) to be held in June. NOCoE will benefit from user surveys, evaluation of the website and technical services program, as well as an internal gap analysis to identify improvements to its approach, focus, and services to the TSM&O community. A new Technical Services Plan (TSP) and Outreach and Engagement plan will be effective from July 1, 2016, incorporating feedback from these efforts.

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MARCH 2016





2015 ANNUAL REPORT

A REVIEW OF ITS FIRST YEAR

MARCH 2016





Letter from the NOCoE Chair



To the Transportation Systems Management and Operations Community:

On January 11, 2015, the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), the Intelligent Transportation Society of America (ITS America), and the Federal Highway Administration (FHWA) of the U.S. Department of Transportation (U.S. DOT) united at the Transportation Research Board's Annual Meeting in Washington, D.C. to launch the National Operations Center of Excellence (NOCoE). With its vision to improve surface transportation system reliability by lending exceptional support services to TSM&O practitioners, the NOCoE has in its inaugural year launched an array of products and services to support the TSM&O community and the public it serves.

As its Chair, I am proud that the Center has joined forces with a strong array of organizations already serving the field to complement their efforts and to serve as a focal point of collaboration among AASHTO, ITE, ITS America, FHWA, TRB, and TSM&O practitioners. This first annual report speaks to the origins of the Center and its first year's accomplishments of which we should all be proud. Equally important, it stresses the value of learning from its first year and developing its plan for the next one.

In addition to the extremely significant contribution of the founding partners, I express my appreciation to my fellow Board members who represent the partnering organizations, and the Technical Advisory Committee (TAC) chaired by Tony Kratofil from the Michigan DOT. Without these men and women, the vision of NOCoE would still be just that; instead, its first year in existence has placed the Center on the path to elevating the role and effectiveness of the TSM&O community in the manner it deserves.

Sincerely,

Shailen P. Bhatt

*Executive Director, Colorado Department of Transportation
Chair of the NOCoE Board of Directors*

Front cover photos courtesy of Trevor Wrayton, VDOT

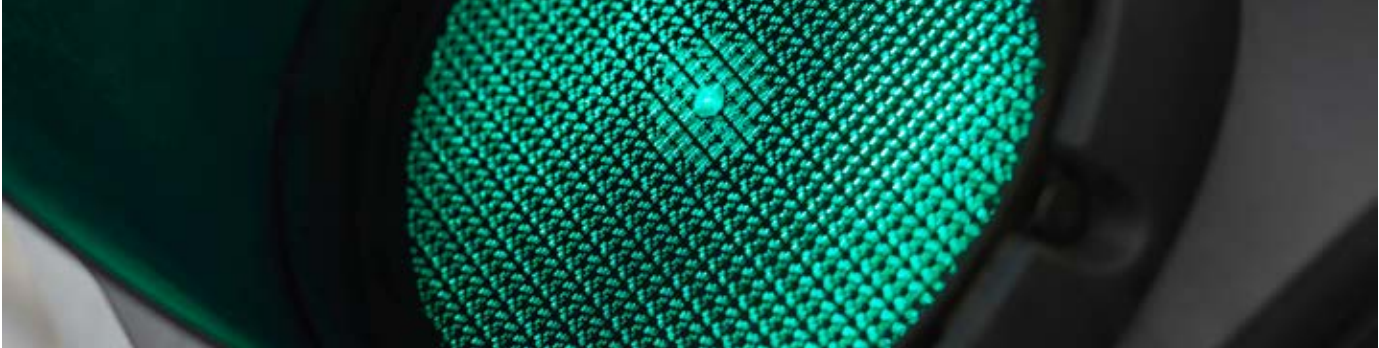


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The Idea and Origins of a Center of Excellence

The transportation systems management and operations (TSM&O) discipline and its stakeholder community have grown in significance over the last several years, and its role within the broader transportation community is now widely recognized. However, unlike some more established transportation disciplines (e.g. design, pavements, bridges, etc.), TSM&O subject matter, in its infancy, had neither a traditional institutional support structure nor a centralized home for collecting and disseminating best practices and research needs. The travel time reliability research completed as part of the second Strategic Highway Research Program (SHRP2) provided a number of products to support the advancement of TSM&O, and formally established the long-term need for a more centralized and comprehensive set of resources to serve the TSM&O community. From this need, the National Operations Center of Excellence (NOCoE) was established.

The National Cooperative Highway Research Program (NCHRP) 20-07 (298) Operations Center of Excellence Report framed what the creation of NOCoE might consider:

Advancing toward “excellence” in TSM&O requires continuous progress toward improving practice, as defined by desired performance outcomes. A “center” of excellence is commonly defined as “a team, a shared facility or an entity that provides leadership, evangelization, best practices, research, support, and/or training for a focus area. It may also be known as a competency center or a capability center. The term may also refer to a network of institutions collaborating with each other to pursue excellence in a particular area.” The proposed

Operations Center of Excellence (OCOE) includes all these definitions.

The American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), and the Intelligent Transportation Society of America (ITS America), with support from the U.S. Department of Transportation’s Federal Highway Administration (FHWA), established memorandums of understanding (MOUs) to work together in creating a business plan for NOCoE. This included the enhancement of the original SHRP2-based website product to serve as the NOCoE web platform, along with subsequent revisions and the addition of new features to support continued growth and operations.

Staffing and administrative support for NOCoE is provided in accordance with the MOUs. Financial support for the operation and services to NOCoE is provided by FHWA and voluntary state department of transportation contributions. In-kind services to NOCoE are also provided by the MOU partner associations. Governance of the NOCoE is provided by a Board of Directors comprising representatives from AASHTO, ITE, and ITS America, with FHWA serving as a non-voting member. In its oversight role of NOCoE, the Board of Directors’ responsibilities include:

- ▶ Establish overarching policies and procedures
- ▶ Evaluate the performance of the Executive Director (with AASHTO)
- ▶ Oversee and be accountable for NOCoE operations, including financial management

- ▶ Define and set priorities for NOCoE's programs and service offerings with the Executive Director
- ▶ Review and approve an annual budget and performance plan
- ▶ Engage the stakeholder community in developing and evaluating NOCoE's programs and activities
- ▶ Periodically evaluate the effectiveness of NOCoE's programs and activities

To help ensure that the needs of the TSM&O community are being met through its activities, NOCoE formed a Technical Advisory Committee (TAC) comprising volunteers from the MOU partner associations. The TAC members are a direct link to the TSM&O stakeholder community through their day-to-day interactions and planned outreach/engagement. The TAC serves as one of the main committees to provide input to the Executive Director, and serves as an important liaison with the stakeholder community. As part of this duty, TAC members will have input into the selection of topics for webinars, workshops, summits, and other activities within NOCoE. A representative from FHWA also participates in the TAC, and provides coordination between NOCoE and the FHWA Office of Operations.



The Stakeholder Community—The Center of It All

Conceptually, a stakeholder is a person, group, or organization affected by an organization's actions, objectives, and policies. In the context of NOCoE, these stakeholders could be TSM&O practitioners, researchers, or policymakers. An important historical challenge that NOCoE and its more established peers must help to overcome is the stove-pipe setting in which TSM&O stakeholders often operate. Traditionally, the TSM&O community has received fewer resources and less agency prioritization than other transportation sectors (such as asset management and capital projects), but with emerging research and agency practices better defining contemporary challenges around cost effective investment, maximizing the utilization of existing capacity, and utilizing technological innovations to improve safety and reliability, the role of TSM&O is more important than ever.

With this in mind, what exactly is TSM&O?

Transportation Systems Management and Operations (TSM&O) is an emerging program that focuses on reducing transportation system user delay and improving reliability by implementing strategies that prepare for and respond to specific causes of unexpected delay and disruption—crashes, breakdowns, weather, construction, poorly timed signals, and special events—not directly addressed by additional capacity. Together, these causes account for more than half of roadway travel congestion, delay, and unpredictability. (From The NCHRP 20-07 (298) Operations Center of Excellence Report)

The definition from the Moving Ahead: Progress for the 21st Century (MAP-21) transportation legislation is the most authoritative (in that it is the most recent) definition, and is the basis for federal funding of the TSM&O discipline. It states:

The term “transportation systems management and operations” means integrated strategies to optimize the performance of existing infrastructure through the implementation of multimodal and intermodal, cross-jurisdictional systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of the transportation system.

During the first year of NOCoE's stakeholder engagement efforts, several key groups have emerged, representing important perspectives within the TSM&O community. At the highest level, this includes the three founding partners (AASHTO, ITE, and ITS America). Each of the partners have subcommittees, councils, and forums with whom NOCoE interfaces directly. Within AASHTO, there is the Standing Committees on Highways (SCOH), the Subcommittee on TSM&O (STSMO), the Subcommittee on Maintenance (SCOM), the Subcommittee on Traffic Engineering (SCOTE), the Subcommittee on Research (SCOR), and the Special committee on Transportation Security and Emergency Management (SCOTSEM). In contrast, ITE has separate District/Sections that NOCoE works with, in addition to their individual technical councils. Lastly, ITS America houses its ITS Coordinating Council, various user forums and working groups, and the ITS state chapters.

In addition to the NOCoE founding partners, there is also a cadre of federal supporters, namely U.S. DOT and FHWA, along with specific departments within these agencies, such as the Office of Operations, Office of Transportation Management, Office of Transportation Operations, Resource Center, Office of Research and Development, U.S. DOT Office of ITS-JPO, and the Office of Freight Management and Operations. NOCoE was also privileged to work closely with the Transportation Research Board (TRB) in its first year, largely with their National Cooperative Highway Research Program (NCHRP), Freeway Operations Committee, Regional TSM&O (RTSMO) Committee, and various RTSMO subcommittees.

Working with these stakeholders will allow NOCoE to engage a diverse audience, including state DOT practitioners and planners, ITS professionals, equipment manufacturers and vendors, as well as engineers and policymakers. However, there are also a number of constituencies which

do not fall within the traditional realm of these stakeholder groups, and whom NOCoE must continue to actively seek out. These include, but are not limited to, TSM&O practitioners at the county, municipal, and city levels; metropolitan planning organizations (MPOs); multi-state corridor coalitions; universities and other research institutions; state and local law enforcement; fire departments and emergency medical services (EMS); towing industry representatives; technology companies (Google, HERE, INRIX, etc.); automotive manufacturers; entities such as “The Operations Academy”; various pooled-fund studies; and the media.

With these stakeholders in mind, NOCoE has worked collaboratively with its founding partners to develop an outreach and engagement strategy and technical services plan that would identify and meet the needs of the community. Year One efforts focused primarily on establishing relations with and working through existing governing bodies at AASHTO, ITE, ITS America, TRB, and FHWA.



The Center's Launch: TRB January 11, 2015

The hard work of the founding partners to establish a common purpose, captured in an MOU on August 30, 2013 and again on April 24, 2014, established the groundwork for NOCoE's launch. Prior to the launch, the partners worked with FHWA and the SHRP2 implementation effort to establish a website with knowledge resources, news, a calendar of TSM&O events, and a discussion forum. The launch of NOCoE officially took place at the TRB Annual Meeting on January 11, 2015.

At the launch event, Don Hunt, executive director of the Colorado Department of Transportation and first board chairman of NOCoE, said: "I am very proud that AASHTO and our partners conceived, planned, funded, and launched

the center in just two years. The center will be invaluable to a range of public and private entities working to improve the operational performance of the transportation system."

All three association partners spoke at the launch, with Chairman Hunt's comments followed by Bud Wright, Executive Director of AASHTO. "The TRB Annual Meeting is a fitting backdrop for the launch of this innovative new center," said Bud. He went on to state that transportation professionals generally, and especially those in state DOTs that comprise AASHTO, "will benefit from the professional assistance, technical resources, and support to be provided by the center."



Don Hunt, Philip Caruso, Bud Wright, Tom Kern, Dennis Motiani, and Jeffrey Lindley.

Phil Caruso, on behalf of Thomas W. Brahms, then-ITE executive director and chief executive officer, said, “Our expectation is that the Center will provide resources to improve the transportation experience of the traveling public to enable them to get where they want to go in a timely, safe, and reliable manner. This new partnership brings together the transportation community’s different perspectives by sharing best practices, good and bad experiences to form lessons learned as well as engaging a network of peers to improve the operation of the transportation system for all users.”



Shailen Bhatt, Jeffrey Lindley, Laurie Matkowski, Dennis Motiani, Douglas Wiersig, Don Hunt, Gregory Johnson, Harry Voccola, and Abbas Mohaddes.

“ITS America is thrilled to have been a partner from the beginning in the planning, design, and implementation of the National Operations Center of Excellence,” said Thomas E. Kern, then ITS America’s interim president and chief executive officer. “It is incumbent on all of us who have a stake in the transportation systems management and operations community to support all efforts to mainstream our work and ensure that we make an effectively managed road network integral to our mission.”

“We know that by doing an optimal job of managing and operating our highways, we can dramatically improve safety and travel time reliability,” said Dennis Motiani, NOCoE’s inaugural Executive Director and former assistant commissioner for transportation systems management at the New Jersey Department of Transportation. “I’m honored to be asked to lead the NOCoE effort,” said Motiani. “It’s our goal to provide support and information about effective operations and management practices, so transportation agencies can better utilize taxpayer dollars.”

At the TRB launch event, NOCoE committed to offering an array of peer exchanges, webinars, assessments, on-call assistance, and training on topics such as integrated corridor management, active traffic management, traffic management centers, and incident response.

“The transportation field is changing. Yes, we still build roads with the goal of moving people and goods from point a to b as safely and quickly as possible. But the tools available to help us in this work are becoming both far better and more complex with the increasing pace of innovations in practice and technology. To make the best decisions to efficiently manage and maintain the systems for which we are responsible, we need to learn from each other to use our limited resources wisely and to evaluate and improve continually what is working.”

— Brad Freeze, Director, Traffic Operations Division, Tennessee DOT



Products and Services of the Center

As part of NOCoE's cooperative agreement with its founding partners, the Center has committed to prepare and deliver a planned program of technical services for its stakeholders. The Technical Advisory Committee (TAC) played a major role in developing the first Technical Services Plan (TSP), which guides the products and services to be offered by NOCoE.

In advising on the allocation of resources within the TSP, the principles laid out by the Capability Maturity Model (CMM) served as an overarching theme for consideration. The CMM defines categories which describe the degree of TSM&O program maturity within public transportation agencies; depending on the level of program maturity, different agencies may have different needs in terms of external technical services. For example, a nascent TSM&O program does not have a great deal of internal resources devoted to workforce development best practices, and may benefit by having NOCoE establish this as a priority topic area for its technical services. Conversely, a mature TSM&O program within a state agency, with years of hiring and skills development experience, may have little use for such an offering.

The TAC also weighed responses from a 2015 survey of agencies regarding their TSM&O priority needs, which was conducted jointly by the AASHTO Subcommittee on TSM&O (STSM&O) Systems Operations Strategies Technical Working Group and NOCoE. The results of the survey can be summarized by several strategic themes:

- ▶ Workforce development,
- ▶ Creating a business case for TSMO,
- ▶ Provide leadership,
- ▶ Policy and procedural issues,

- ▶ Research repository,
- ▶ Developing a "Green Book" for operations,
- ▶ Technology related issues, and
- ▶ Planning and performance measurement/management.

The menu of products and services in the inaugural TSP was tempered against the reality that there were limited resources, and to do everything all at once at the inception of NOCoE was impractical. At the same time, tangible and highly valuable products and services needed to be provided in the short term to demonstrate the value of NOCoE, and to garner critical support from sponsoring agencies, to ensure a sustainable and long-term future for the Center. The products and service ideas were ranked based on the relevancy to the themes identified above, and the score received from the voting by TAC members. The top ranked products or service ideas included: in-person peer exchanges, webinars, virtual peer exchanges (invitation only, topic specific engagements), TSM&O information resources including a research library (online platform), speakers' forum, and a national TSM&O summit on a topic of consequence to the field.

The inaugural TSP unveiled in July 2015 focused on these services, with the highest priority given to the maintenance and strengthening of a web presence (inclusive of a knowledge center to house TSM&O information resources), a webinar series (including, where appropriate, virtual peer exchanges whose audiences were more narrowly defined), and a range of in-person peer exchanges. Work on a national workforce development summit began toward the end of the first year and plans for a speakers' forum are under development.



Overview of NOCoE Website

The NOCoE website is a culmination of research conducted under the SHRP2 program on travel time reliability. As part of this research program, it was desired to maintain a knowledge transfer system (KTS) for practitioner resources and guidance materials for the purpose of improving travel time reliability. As a part of implementation of the SHRP2 research products and in anticipation of the creation of NOCOE, the KTS was enhanced with additional features such as active training and peer exchange materials, including webinars, blog postings, and a discussion forum. This new EKTS is maintained through a MOU between ITE, AASHTO, ITS America, and FHWA.

As part of the development of the website, the existing technical material and support information (including membership rosters) (EKTS) were brought over from the website for the National Traffic Operations Coalition (NTOC). Independent NTOC technical services and resources (including the website) are in the process of sunsetting, with all functionality to eventually be rolled into the NOCoE website and technical services program. In an effort to further enhance the website, there was an update to its current version 1.1. This was done to address feedback from the community regarding usability as well as lessons learned in the first six to nine months of operation.

The screenshot shows the NOCoE website homepage. The header includes the NOCoE logo, the tagline "National Operations Center of Excellence Your Transportation Operations Resource", and navigation links: Home, About, Contact Us, SHRP2, and social media icons for Twitter and LinkedIn. There are also buttons for Logout, Profile, and a Search icon. Below the header is a horizontal menu with links: KNOWLEDGE CENTER, DISCUSSION, CALENDAR, TSM&O RESOURCES, WHY TSM&O?, NEWS, and BLOG. The main content area is divided into two columns. The left column features a "WELCOME TO THE NATIONAL OPERATIONS CENTER OF EXCELLENCE" message, a "NOCOE WEBINARS" section with a "View Previous Recordings" link, and a large image of a keyboard with a "Webinar" button. The right column features a "HEADLINE NEWS" section with a "View All" link and three news items: "The Director of Google's Self-Driving Car Program Talks About the Future of Autonomous Vehicles" (March 04, 2016), "A Guidebook on Transit-Supportive Roadway Strategies" (March 04, 2016), and "USDOT ITS Joint Program Office - Updates to the Open Source Application Development Portal (OSADP)" (March 04, 2016). To the right of the news items are four buttons: "Industry Developments", "Upcoming Events", "Center News", and "Most Recent Post". At the bottom of the left column are "Previous" and "Next" navigation buttons.

The current NOCoE website is divided into the following components:

- ▶ **Knowledge Center:** This forms the basis of the ECTS that arose out of the SHRP2 program. It currently contains over 1,000 individual items and is a repository for key technical content and training materials related to TSM&O. Materials may be hosted locally on the NOCoE website or remotely through various partner websites.
- ▶ **Discussion Forum:** A place for TSM&O practitioners to interact with one another on various issues pertaining to TSM&O. The nature of this discussion may be related to a webinar, newsletter, or peer exchange, or it may be on a separate topic of interest to practitioners.
- ▶ **Calendar:** A listing of all events sponsored by the NOCoE, including webinars, workshops, and peer exchanges, and relevant TSM&O-related events sponsored by other organizations.
- ▶ **TSM&O Resources:** Direct listings to websites for various NOCoE partners and TSM&O technical resources. These links do not correspond to TSM&O specific technical products or training materials, in contrast with the Knowledge Center.
- ▶ **Why TSM&O?:** Resources for agencies to establish a case for supporting TSM&O practices and business processes.
- ▶ **News & Blog:** Current TSM&O resource publications, announcements, industry developments, the latest opportunities, as well as posts on various TSM&O-related subjects by experts in the field.



Webinars

The NOCoE webinars have proven to be a useful resource in engaging the TSM&O community, allowing knowledge transfer and peer-to-peer exchange in a virtual environment. These webinars have shown to be effective in NOCoE's effort to further facilitate knowledge sharing and the dissemination of best practices. Through these webinars, NOCoE has highlighted case studies and best practices, training and skill development, technical assistance, research news, as well as other learning opportunities to enhance the community's knowledge of TSM&O-related activities. Webinars have been recorded and posted on the NOCoE website so they may be accessed anytime, further enabling on-demand learning for the TSM&O community.

Through input from the TAC and our partnering organizations, the subjects of the webinars have been diverse, seeking to engage cross-cutting stakeholders to participate. Unlike peer exchanges, webinars are usually widely promoted and open to all interested registrants, acting as both a technical service and an effective outreach tool for NOCoE. The Center can also sponsor virtual peer exchanges that are essentially invitation-only webinars among a smaller group of practitioners to allow for targeted discussion.

Thus far, NOCoE has hosted more than 20 webinars; this number will likely increase in its second year. Upcoming webinars planned for 2016 already include events co-hosted by the Delaware Valley Regional Planning Commission, New Jersey DOT, FHWA, TRB, AASHTO, and we are continuing to reach out to partners and other stakeholders.

Following is a complete list of webinars either hosted or co-hosted by NOCoE from January 2015 to January 2016:

1. National Performance Management Research Data Set Webinar Series Part 1: Introduction to the National Performance Management Research Data Set (NPMRDS) (Attendance: 128)
2. Post Transportation Research Board 2015 Annual Meeting Research Webinar (Attendance: 50)
3. Fundamental Capabilities of Effective All-Hazards Infrastructure Protection, Resilience, and Emergency Management for State Departments of Transportation Securing Transportation Systems (Attendance: 227)
4. Capability Maturity Model Webinar 1: Self-Evaluation/Agency Culture (Attendance: 121)
5. Capability Maturity Model Webinar 2: Organization and Staffing (Attendance: 101)
6. Virtual Peer Exchange: Data Availability, Integration & Warehousing for Transportation System Management & Operations Performance Measures #1 (Attendance: 121)
7. Capability Maturity Model Webinar 3: Performance Measurement (Attendance: 72)
8. Capability Maturity Model Webinar 4: Collaboration (Attendance: 53)
9. National Performance Management Research Data Set Webinar Series Part 2: Application of the National Performance Management Research Data Set for Performance Management (Attendance: 70)

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CALENDAR SEARCH RESULTS

Start Date	Event Type	Title
	Webinar	TRB Webinar: Scalability of Roundabouts <i>Saturday, March 26, 2016 at 2:00 pm - Saturday, March 26, 2016 at 3:30 pm</i>
	Meeting	ITE Texas District Annual Meeting <i>Wednesday, March 30, 2016 at 10:00 am - Friday, April 1, 2016 at 6:30 pm</i>
	Webinar	DVRPC / NJDOT Complete Team Initiative <i>Wednesday, April 6, 2016 at 2:00 pm - Wednesday, April 6, 2016 at 3:30 pm</i>
	Conference	2016 Transportation Curriculum Coordination Council Annual Meeting <i>Sunday, April 10, 2016 at 7:07 am - Wednesday, April 13, 2016 at 4:16 pm</i>
	Conference, Meeting	ITE Southern District Annual Meeting 2016 <i>Sunday, April 10, 2016 at 10:00 am - Wednesday, April 13, 2016 at 5:00 pm</i>

- | | |
|---|--|
| 10. Capability Maturity Model Webinar 5: Systems and Technology (Attendance: 34) | Program/National Operations Center of Excellence (Attendance: 101) |
| 11. Leadership in Transportation System Management & Operations Video Webinar (Attendance: 127) | 16. Traffic Incident Management Performance Measurement (Attendance: 65) |
| 12. Capability Maturity Model Webinar 6: Business Processes (Attendance: 73) | 17. Transportation Research Board Annual Meeting 2016 Preview: Evolving the Next Generation of Transportation System Management & Operations Research (Attendance: 68) |
| 13. National Association of City Transportation Officials/ National Operations Center of Excellence Joint Webinar: Traffic Incident Management-Lessons Learned in Seattle (Attendance: 144) | 18. Special Committee on Transportation Security & Emergency Management Webinar (Attendance: 53) |
| 14. Transportation System Management & Operations Performance Measurement and Performance Management Programs (Attendance: 81) | 19. Innovative Intersection Design (taped for general distribution) |
| 15. Implementing Integrated Corridor Management: Scan Findings, Updates and Next Steps/National Cooperative Highway Research Program U.S. Domestic Scan | 20. Iowa Department of Transportation TCP Program (taped for general distribution) |
| | 21. Webinar on Pennsylvania Department of Transportation Study (taped for general distribution) |



In-Person Peer Exchanges

Learning through a peer exchange was identified early on as an important need during initial surveys leading up to the launch of the NOCoE. Public agency officials and others were very clear about the advantage of learning from their peers in a face-to-face environment. The ability to meet for a day or two and to be able to listen, discuss challenges, form solutions, and collaborate in efforts are the basis of these peer exchanges. The in-person peer exchanges may be initiated by NOCoE or requested by an individual agency. The following is a list of peer exchanges sponsored, facilitated, or conducted by the Center from January 2015 to January 2016.

Traffic Incident Management (TIM) Protocols and Practices

The June 15, 2015 peer exchange in Seattle, Washington, was a result of a crash that occurred in Seattle in March 2015 that caused nine hours of backed-up traffic. The Seattle Department of Transportation had begun a review of its practices and protocols related to Traffic Incident Management (TIM) and, with support from Washington Department of Transportation (WSDOT), requested that the Center support a peer exchange in order to examine and compare their current TIM protocols and practices with national best practices. A report was published in follow up to this peer exchange on July 2, 2015 entitled, *Traffic Incident Management in Seattle: Observations and Recommendations*. This report was made available on the NOCoE website and disseminated amongst the broader TSM&O and TIM community.

Traffic Incident Management (TIM) Train the Trainers—Lessons Learned from the First Round

Fifty TIM planners, leaders, and practitioners gathered at the Tennessee TIM training facility located on the grounds of the Tennessee Highway Patrol (THP) July 15–16, 2015. This workshop was the first step in practical application and expansion of responder safety training. The participants included representatives of towing/recovery, emergency management, transportation, fire, law enforcement, and EMS. Brad Freeze and Frank Horne of Tennessee Department of Transportation (DOT) are leading the effort to create an advanced TIM training curriculum.

Regional Operations Forum (ROF) Follow-Up

The NOCoE sponsored a Northeast Regional Peer Exchange on October 27–28, 2015 in Boston, Massachusetts, at the Massachusetts Department of Transportation. This event brought back together states that participated in a SHRP2 Regional Operations Forum (ROF) in Spring 2014. There were more than 40 participants from Massachusetts, New Hampshire, Maine, Connecticut, Rhode Island, and Vermont, along with the I-95 Corridor Coalition team. Some topics that were discussed were how DOTs are structured for TSM&O and are integrating Transportation System Management & Operations strategies, how DOTs are working effectively with incident responders, and what DOTs are doing differently for snow and ice operations.



Western Summit on Performance Management

The Western States Performance Management Peer Exchange, organized by the NOCoE, occurred on November 16–17, 2015 in Portland, Oregon, and included states that were part of an earlier SHRP2 Regional Operations Forum (ROF). About 30 participants were in attendance from California, Idaho, Oregon, and Washington. Attendees discussed the progress each state is making and the work still to be done regarding the challenge of effective performance management for the Transportation System Management & Operations (TSM&O) Community. Each state provided presentations updating their efforts and shared ideas.

Regional Traffic Incident Management (TIM) Partnership Summit

The Arizona Department of Transportation, Arizona Department of Public Safety, and Maricopa County Department of Transportation, as well as the NOCoE hosted the Southwest Regional Traffic Incident Management (TIM) Summit in Phoenix, Arizona, on December 9–10, 2015. The result was plenary sessions and presentations with highly productive question and answer periods as well as successful participation-focused breakouts. When the Summit was wrapped

up, an important message for attendees was to bring back the highlights and action items to their respective organizations and agencies. There will be a white paper written up on the findings and action items resulting from the Southwest Regional TIM Summit.

Automated Traffic Signal Performance Measures Workshop

This peer exchange, held in Salt Lake City, Utah, on January 26–27, 2016, was co-sponsored by the NOCoE, AASHTO, Utah Department of Transportation (UDOT), and Purdue University (UDOT & Purdue are partners in the FHWA Pooled Fund Study for Traffic Signal Operations & Maintenance). Approximately 170 individuals were in attendance, comprising members from federal, state, and local agencies, as well as academia and the private sector. The event was centered on discussion around the development and use of automated traffic signal performance measures (ATSPMs) based on high-resolution signal controller event data. The event concluded with an in-depth tutorial on how to organize servers and data processing to accommodate ATSPMs being reported from the field, including how to manage long-term storage and retrieval.



Center Outreach and Engagement

A stakeholder outreach and engagement plan was formally submitted to the three associations (AASHTO, ITE, and ITS America), FHWA, and the NOCoE's Board of Directors. The plan reflected strategies and tasks to increase the usage of the web portal and deliver robust technical services by assessing user needs through consistent outreach and continuous engagement of TSM&O stakeholders. Although the formal outreach and engagement plan was not completed until the end of March, the outreach and engagement of the stakeholders began a year and a half before the Center's launch. The engagement portion of the outreach and engagement plan moved into high gear in April and during ITS America's Annual Meeting which overlapped with the STSMO Annual Meeting. This outreach and engagement has been vital in assessing the stakeholders' needs and represents the foundation of the Technical Service Plan.

The following are the high-level goals established specifically for the Outreach and Engagement Plan:

- ▶ Increase use of the NOCoE web portal by creating and growing awareness for NOCoE products and services.
- ▶ Build trust and credibility by making sure the information shared with stakeholders is current, accurate, and meaningful.
- ▶ Create a robust technical service plan by engaging various stakeholders.

Led by Dennis Motiani, NOCoE concentrated its outreach and engagement efforts on a robust monthly newsletter (later shifting to a bi-weekly communication); the launch and maintenance of the NOCoE website (described earlier in this report); and face-to-face, conference call, and electronic interaction with an array of stakeholder groups at the national, state, and local levels. By the end of the first year, the Center had raised awareness in the TSM&O community of its presence, purpose, and products and services, evidenced by the growth of interest and participation in NOCoE activities.

To help assess its effectiveness and identify areas for improvement, two end-of-year evaluations were arranged to review the NOCoE website and the Center's broader strategy of engagement and services. These evaluations were nearing completion at the date of this annual report's publication and their recommendations will be used to inform the TSP and Outreach and Engagement plans for Year Two. In 2016, NOCoE will also be conducting a gap analysis in an effort to better identify who the Center is currently engaging as well as who we need to better target in the future.



Accomplishments and Lessons from the Center's First Year

As part of NOCoE's ongoing improvement efforts, two independent studies are currently underway to assess the quality and efficacy of activities occurring during the first year of the Center's operation. One study, being performed by the U.S. DOT's Volpe Transportation Center, focused on the hard metrics and performance indicators associated with the NOCoE website's use, such as number of visitors, bounce rate (the percentage of visitors who remain on the website for a very short time period), and average number of clicks per visitor. The selection of individual performance measures was based on the following criteria:

- ▶ Do members of the target audience visit the website and use its content?
- ▶ Which website content is most (and least) interesting to members of the target audience?
- ▶ Are people engaging with the website through blog comments and discussion forums?
- ▶ Are newsletter subscribers receiving content that interests them?

The preliminary results of this evaluation are mixed, but provide critical guidance to NOCoE for further honing its activities and direction. For example, as shown in Figure 1, there has been a generally significant increase in the number of unique visitors to the website, as well as the number of returning visitors. How-

ever, the bounce rate for the website (shown in Figure 2) has steadily ticked upwards as well. Although the monthly bounce rates recorded through 2015 are still within the general range for similar information-based and specialty

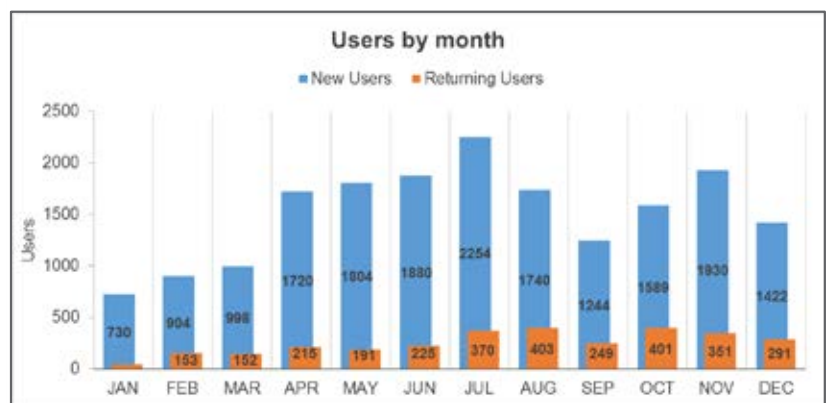


Figure 1. Count of total and returning website users for 2015.
Results from Volpe Center EKTS Evaluation.

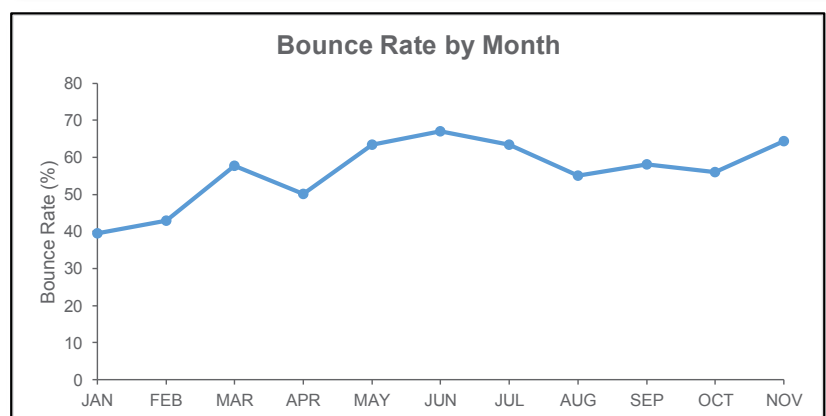


Figure 2. Monthly average bounce rate for website visitors for 2015.
Results from Volpe Center EKTS Evaluation.

knowledge websites, their overall upward trend must be corrected if NOCoE is to establish itself as a legitimate center for TSM&O knowledge and training. Overall, these figures indicate that, while the site has become more effective in drawing in users from a broad TSM&O community, the level of engagement by individual members has stalled or decreased over time.

The Volpe Center evaluation has been useful for broadly assessing the quantitative metrics associated with the website and its content, a separate coordinated evaluation was conducted by CH2MHill, focusing on various qualitative metrics of content offerings from NOCoE. This evaluation complimented the analysis of the performance data from the website and other elements, and incorporated the other technical service offerings (e.g., peer exchanges) from the Center and also probed into the “whys” behind the data trends observed in the other evaluation. Several web-based active discussion events, as well as an online questionnaire, formed the basis of the CH2MHill evaluation.

As the formal results are still being finalized, initial findings suggest that practitioners have derived significant value from the technical service offerings of NOCoE, especially the peer exchanges and newsletters. Several minor changes were recommended to the newsletter format, such as offering a “jump list” of topics, as well as including new website features, such as a “What’s Trending?” functionality. Additionally, evaluation respondents recommended that the Center improve the focus/detail of content in the webinar offerings, and better identify prospective audiences, to maximize interest and engagement. Finally, NOCoE website forums were identified as a significant area of missed opportunity, with current NOCoE users seeing very little value in their use. Such sentiment was echoed by the Volpe Center evaluation, with minimal web traffic to these forums over the past 12 months. On the basis of these results, one of the objectives for the Center in 2016 must be to develop new strategies and activities to engage practitioners in active and ongoing dialogue around current TSM&O practices.



Where Does the Center Go from Here?

At the conclusion of its inaugural year, the Center can look back on a number of accomplishments: a successful launch, the effective formation of its Board and the Technical Advisory Committee, the creation of its two guiding documents—the TSP and the Outreach and Engagement Plan, emerging relations with a range of stakeholder groups within the TSM&O community, and the ongoing provision of the core services it committed to.

Chair Shailen Bhatt, along with the rest of the Board of Directors, provided strong direction and planned an in-depth meeting in the first part of 2016 to review and refine the Center's strategic approach based on the lessons learned in its first year. Following on this effort, a new TSP will be released in early summer to be effective from July 1, 2016 and the next Outreach and Engagement plan will be developed based on the evaluations described earlier. The goal: broadening our reach, but staying focused.

Central to any organization's success is the ability to monitor, evaluate, and manage its value. Just as the TSM&O community concentrates on performance management to ensure service delivery, reliability, and safety, so too does the Center review its performance metrics both to learn from them and to consider other measures that help it ensure it answers the three questions central to any performance dialogue: what has the Center accomplished, how well has it done it; who is better off? The importance of outputs, outcomes, and impacts must be at the center of the NOCoE's agenda if it is to serve the TSM&O community and work well with and complement the efforts of its stakeholders.

NOCoE appreciates the financial support of FHWA and of the states participating in the pooled fund initiative aligned with its agenda. It looks forward to Year Two!



Appendices

Appendix 1

National Operations Center of Excellence Board of Directors and Technical Advisory Committee

NOCoE's Board of Directors comprises representatives from the three partner associations and the U.S. Department of Transportation's Federal Highway Administration (the latter serving in an ex officio capacity). The Board provides strategic thinking and oversight of NOCoE and consists of members from all four partnering organizations. As of January 2016, the Board members are:

Shailen Bhatt, Chair	<i>Executive Director, Colorado Department of Transportation</i>
Jennifer Cohan	<i>Secretary of Transportation, Delaware Department of Transportation</i>
Mike Holder, P.E.	<i>Chief Engineer, Division of Highways, North Carolina Department of Transportation</i>
Greg Johnson	<i>Administrator, State Highway Administration, Maryland Department of Transportation</i>
Laurie Matkowski	<i>Manager, Office of Transportation Operations Management, Delaware Valley Regional Planning Commission</i>
Abbas Mohaddes	<i>The Mohaddes Group</i>
Harry Voccola	<i>Management Consultant</i>
Doug Wiersig, Ph.D., P.E.	<i>Director, Department of Transportation and Public Works, City of Forth Worth</i>
Jeffrey Lindley	<i>Associate Administrator, Office of Operations, Federal Highway Administration, U.S. Department of Transportation</i>

The TAC members are a direct link to the TSM&O stakeholder community through their day-to-day interactions and dedicated and planned outreach/engagement around the community. This is NOCoE's primary committee for providing input to the Executive Director and Center staff on the needs of the stakeholder community. The TAC members have input into the selection of topics for webinars, workshops, summits, and other activities within NOCoE. A liaison from FHWA also participates in the TAC, and provides coordination between NOCoE and the FHWA Office of Operations.

As of January 2016, the following individuals comprise the NOCoE TAC:

Tony Kratofil	<i>Michigan DOT—Chair (AASHTO representative)</i>
Dean Gustafson	<i>Virginia DOT (AASHTO representative)</i>
Galen McGill	<i>Oregon DOT (AASHTO representative)</i>
Phillip “Brad” Freeze	<i>Tennessee DOT (AASHTO representative)</i>
Eric Rensel	<i>Gannett Fleming (ITE representative)</i>
Beverly Kuhn	<i>Texas A&M University (ITE representative)</i>
Patrick McGowan	<i>Serco (ITS America representative)</i>
Peter Keen	<i>Digital Traffic Systems (ITS America representative)</i>
Tracy Scriba	<i>Federal Highway Administration (FHWA representative)</i>

Appendix 2

2015 Contributing States to the Operations Pooled Fund

- Alabama
- Alaska
- Arizona
- Colorado
- Delaware
- Hawaii
- Illinois
- Iowa
- Michigan
- Missouri
- Nevada
- New Mexico
- New York
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- Pennsylvania
- Tennessee
- Texas
- Vermont
- Virginia
- Washington
- West Virginia
- Wisconsin

Appendix 3

NOCOE Staff and MOU Partner Liaisons

Thomas E. Kern, Managing Director
Steven M. Lavrenz, Ph.D., EIT, Technical Services Manager
Deborah Rouse, Technical Communications Manager
John Conrad, Consultant
Shane Trimmer, Consultant
Jennifer Carter, ITS America Liaison
Gummada Murthy, AASHTO Liaison
Douglas Noble, P.E., ITE Liaison



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