SUMMARY REPORT

Mobility and Congestion Performance Data

Peer Exchange

Location: Portland, OR

Date: May 9 & 10, 2016

Host Agencies: Federal Highway Administration and Oregon Department of Transportation

Peer Agencies: Alaska DOT & PF, Anchorage Metropolitan Area Transportation Solutions, Caltrans, Central Lane Metropolitan Planning Organization, Colorado DOT, Community Planning Association of Southwest Idaho, Denver Regional Council of Governments, Idaho Transportation Department, Iowa DOT, Macatawa Area Coordinating Council, Metropolitan Transportation Commission (MTC), Metro (Portland MPO), Michigan DOT, Nevada DOT, Oregon DOT, Regional Transportation Commission of Southern Nevada, Salem-Keizer Area Transportation Study, Southwest Washington Regional Transportation Council, TriMet, Washington State DOT

Federal Agency: Federal Highway Administration

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To promote sharing of noteworthy practices regarding inter-agency collaboration for mobility and congestion performance data management and use among State DOTs and MPOs, the FHWA sponsored a peer exchange held in Portland, OR on May 9 and 10, 2016. The peer exchange utilized material being developed under the Transportation Performance Management (TPM) Capacity Building Program, specifically the TPM Framework and Capability Maturity Model elements of the TPM Toolbox.

Peer exchange participants were drawn from State DOT and MPO pairs from across the western states. Each participant engaged with all other participants to share noteworthy practices, current approaches, and challenges related to data management and use for mobility and congestion performance. Subsequent sessions included action planning by State DOT and MPO pairs for collaborative actions to improve data management and use related to mobility and congestion performance.

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Contents

Foreword

This report summarizes the presentations and key themes arising from the Mobility and Congestion Performance Data Peer Exchange held May 9 and 10, 2016 in Portland, Oregon. With support from the Federal Highway Administration (FHWA) Office of Transportation Performance Management, the Oregon Department of Transportation (ODOT) hosted peers from State DOT and MPO pairs from western states. The purpose of the peer exchange was to explore how to improve collaboration between State DOTs and MPOs to manage and use data for congestion, mobility, and system performance.

Acknowledgement

FHWA thanks the Oregon Department of Transportation for hosting the peer exchange at the Region 1 Office in Portland. In addition, FHWA would like to thank all staff that attended and participated. The candid discussions during the event enabled each participant to fully engage with the issues at hand, and to leave with valuable information and contacts for future action regarding congestion and mobility performance data management and use. Thank you to each agency that supported staff in attending this event by enabling travel and promoting learning and skills development.

Overview

INTRODUCTION

Transportation Performance Management (TPM) is a strategic approach that uses system information to make investment and policy decisions to achieve performance goals. An increasing number of transportation agencies are adopting TPM principles to ensure the right bundle of projects is selected and delivered to produce the performance outcomes desired by the agency, external partners, elected officials, and the public. TPM helps determine what results are to be pursued, using information from past performance levels and forecasted conditions to guide investments, measuring progress toward strategic goals, and making adjustments to improve performance. TPM is grounded in sound data management, usability, and analysis as well as in effective communication and collaboration with internal and external stakeholders. The key to successful implementation of TPM practices lies in the organizational support and agency embrace of data-driven decision making.

TPM uses performance information to create a linkage between an agency's strategic direction, resource allocation decisions, individual employee activities, and external stakeholders' priorities. Some benefits of instituting TPM practices include:

- **Creation of Unifying Focus for Agency**: Carefully considered and connected goals, objectives and measures become the structure upon which an agency's performance management approach rests. Clearly communicating "where do we want to go" builds staff support for the agency's purpose and provides a unifying direction for day to day activities. Additionally, articulating longer term outcomes for an agency and determining how progress will be evaluated not only helps clarify what the public and other stakeholders expect from the agency, but also links transportation investments to what the public cares about.
- **Prioritization of Investments Based on Performance Needs**: Information on past performance and expected future conditions enables agencies to guide resources to areas most in need of attention, thus using resources most effectively. Data highlight areas of lagging performance, enabling prioritization of projects to address such lags. By making decisions to improve how the transportation system functions, agencies engaged in TPM can minimize life-cycle costs of assets.
- **Feedback Loop between Decisions and Results**: The active use of performance information provides key insights into the effectiveness of strategies and can identify where project and/or program adjustments need to be made. Data on results can also provide new insights into causal factors contributing to performance outcomes and identify data gaps that need to be closed.
- **Connection of Individual Staff Activity to Agency Goals**: A performance management approach creates the opportunity to demonstrate to each individual staff member how their work contributes to the attainment of agency goals, objectives and performance targets. Strategic goals and targets are "why" employees perform their assigned tasks.
- **Transparent Decision-making**: TPM demonstrates to external stakeholders that the agency is taking an analytical, data-driven approach to decision making. As public entities, transportation agencies must prove that they are using public money prudently by being transparent about how decisions are made.
- **Linkage of Funding Requests to System Performance**: Performance data can indicate the effect of declining or increasing funding levels on performance of the transportation system; by making the case to policymakers using data, agencies can and have been successful in obtaining increased funding.
- **Communication of the Benefits from Transportation Investments**: Through engagement with the public and other stakeholders, agencies clearly understand what performance outcomes are desired. Performance data enables agencies to inform external stakeholders on the results of investment decisions.

- **Fulfillment of Legislative Requirements**: The Moving Ahead for Progress in the 21st Century (MAP-21) Act[1] and the subsequent Fixing America's Surface Transportation (FAST) Act[2] put greater emphasis on TPM by requiring use of such practices in statewide, metropolitan, and non-metropolitan transportation planning.

Data provide a foundation for TPM, informing decisions about how to best use available resources to maximize transportation system performance. Increasingly, agencies are recognizing that data should be managed as a valuable asset, analogous to physical assets like pavement and bridges.[3]

Data management practices are crucial to TPM and can benefit an agency in a variety of ways:

- Improving the accuracy, completeness, consistency, and timeliness of data;
- Providing a "single version of the truth" to use in analyses and reporting;
- Enabling new analysis possibilities through providing more accessible data and data linkages;
- Collecting and sharing data more efficiently across an agency and with agency partners; and
- Fostering a culture that understands and supports the value of data in business processes.

Data management practices can be implemented both at an agency-wide level and within individual business units. For example, a business unit might implement a data quality management process for the data it collects, while an agency might have overarching standards so that data can be integrated and shared across different business units. Some aspects of data management may also involve cross-agency collaboration – for example, to standardize data elements for aggregation and reporting.

TPM processes depend on the existence of relevant data sets, provided in usable, convenient forms. This includes processes to assess data and analysis requirements, select tools, implement analysis capabilities, and develop and improve these capabilities over time. Data usability considers the ability of a user to derive useful information from data. Data provided in a series of text files that requires weeks of complex processing to be in a form suitable for analysis is not very usable. On the other hand, data delivered on a performance dashboard that can be immediately interpreted would be highly usable.

TPM, as an approach that relies on data-driven decisions, requires robust data management, usability, and analysis capabilities to be successful. By improving data management and usability, agencies can make strides toward improved performance. The condition of bridges, pavement, transit vehicles, and bike infrastructure will improve within a TPM practice, leading to improved conditions for system users in areas such as safety, mobility, and public and environmental health. Using data, agencies can allocate resources to address regional priorities and ensure that every dollar is spent to impact performance in a positive way.[4]

ORGANIZATION OF THIS REPORT

This summary report is organized in two sections:

1. Overview: an overview of the workshop format, agenda, and participants.
2. Workshop Summary: a summary of presentations, breakout discussions, and action planning. It also includes Key Themes and Strategies stemming from the event.

[1] Moving Ahead for Progress in the 21st Century. May 23, 2016. http://www.fhwa.dot.gov/map21/
[2] Fixing America's Surface Transportation Act. May 23, 2016. http://www.fhwa.dot.gov/fastact/
[3] NCHRP Report 814: Data to Support Transportation Agency Business Needs: A Self-Assessment Guide
[4] FHWA. (2013). *Performance-Based Planning and Programming Guidebook* (FHWA Publication FHWA-HEP-13-041). Washington, DC. http://www.fta.dot.gov/documents/Performance_Based_Planning_and_Programming_Guidebook.pdf

The Key Themes and Strategies section synthesizes main points from the peer exchange (listed below) and highlights technical assistance needs identified by participants.

- Changing technology
- Partnerships with external groups
- Communication and reporting
- Resource constraints

The Appendix includes further detail regarding the agenda, participants, and questions and answers stemming from leading agency presentations.

PEER EXCHANGE DESCRIPTION

To assist agencies in implementing and improving TPM practices, this peer exchange provided an opportunity for agencies to learn from each other, specifically related to collaboration between MPOs and DOTs for data management. The Anchorage MPO, Anchorage Metropolitan Area Transportation Solutions, requested this topic. The peer exchange focused on congestion, mobility, and system performance because this is an area that is complex and less well developed than other performance areas such as safety.

During the peer exchange, pairs of subject matter experts from the DOT and MPO shared experiences and explored future opportunities related to collaboration for data management and usability. The following agencies participated:

- Alaska DOT & Public Facilities
- Anchorage Metropolitan Area Transportation Solutions
- Caltrans
- Central Lane Metropolitan Planning Organization
- Colorado DOT
- Community Planning Association of Southwest Idaho
- Denver Regional Council of Governments
- Idaho Transportation Department
- Iowa DOT
- Macatawa Area Coordinating Council
- Metropolitan Transportation Commission (MTC)
- Metro (Portland MPO)
- Michigan DOT
- Nevada DOT
- Oregon DOT
- Regional Transportation Commission of Southern Nevada
- Salem-Keizer Area Transportation Study
- Southwest Washington Regional Transportation Council
- TriMet
- Washington State DOT

Participants were expected to come with an understanding of agency processes and to be willing to both teach and learn during the event. Participants left with:

- A knowledge of peer agency activities and knowledgeable staff at those agencies
- An understanding of data management business plan creation
- An action plan for improving data management practices and collaboration

In sum, the purpose of the peer exchange was to improve collaboration between DOTs and MPOs to manage and use data for congestion, mobility, and system performance.

FORMAT AND AGENDA

The peer exchange spanned one and a half days. Day one began with a focus on State DOT and MPO collaboration and data issues from a national perspective, including presentations by FHWA, the Association of Metropolitan Planning Organizations (AMPO), and Cambridge Systematics. Following this, the elements of the TPM Toolbox were introduced to set the stage for later discussions and exercises. The TPM Toolbox is a collection of resources being developed under the FWHA Capacity Building Program. Resources will include the TPM Implementation Guidebook and the TPM Capability Maturity Self-Assessment that will assist agencies to assess their current situation and to initiate and improve TPM practices. Washington and Oregon presented on their current practices as leading agencies in data management and usability, and after lunch, all participants engaged in breakout discussions. Breakout groups were randomized to ensure a mix of perspectives from various agencies. Breakout one focused on current practices and challenges surrounding assembling and managing data, while breakout two focused on data usability. Each breakout concluded with a report out to the larger group so that all information was shared among all participants.

Day two focused on using the TPM Toolbox Capability Maturity Model (CMM) to action plan for improvements related to data management and usability for mobility and congestion. Maturity models have proved to be a useful framework that can be applied in order to assess an organization's current state, identify a logical set of improvements, and show the benefit of moving to higher capability levels. The primary objective of the TPM CMM is to provide maturity definitions for the TPM components that transportation agencies could begin using to evaluate their TPM capabilities, and identify areas where they should take steps to improve these capabilities. During the peer exchange, State DOT and MPO pairs worked in groups to develop a joint action plan. The peer exchange concluded with participants sharing key takeaways from their action plans and the event overall, as well as ideas for future technical assistance.

The full agenda and a list of participants can be found in the Appendix.

Workshop Summary

All presentations can be accessed at the following link: http://sites.spypondpartners.com/peerexchanges/201603/. Information below was captured from group and breakout discussions, as well as questions and answers stemming from presentations.

NATIONAL PERSPECTIVE PRESENTATIONS

Francine Shaw-Whitson of FHWA shared information about the rulemaking schedule and the status of implementation. The safety rule is now final and involves annual target establishment, reporting, and assessment of progress. Infrastructure Performance Final Rule is anticipated in October of 2016. Francine summarized the proposed Performance, Freight, and Congestion Mitigation and Air Quality (CMAQ) measures including travel time reliability, peak hour travel time, and others. She also highlighted improvements to the performance reporting website that is under development.

Chris Allen of FHWA discussed culture shifts regarding the Highway Performance Monitoring System (HPMS) and how interrelated data requirements and data sources necessitate collaboration across agencies. There are a number of reasons why data can be delayed, which can cause issues in reporting and adjustment. These reasons might include situations where the bridge group did not locate bridges for the HMPS Coordinator, the pavement group claiming data given by the HPMS Coordinator is not in fact from the pavement group, the agency is transitioning to new software, or a traffic consultant is late.

DeLania Hardy of AMPO presented the results of a survey of AMPO members regarding performance data for congestion and mobility. A vast majority of MPOs reported using volume data collected by the State DOT, and almost 40% reported using a tool from the private sector to model mobility/congestion. Many MPOs collaborate with State DOTs in planning activities and use State DOT data.

Anita Vandervalk-Ostrander of Cambridge Systematics discussed the benefits of data business planning and provided an overview of the draft FHWA Office of Operations Data Business Plan Guide that will assist agencies via seven steps, including Stakeholder Outreach, Data Assessment, Gap Assessment, Improvement Plan, Data Governance Processes and Documents, Data Management Practices, and Develop Data Business Plan. The Guide is being tested with the Hillsborough MPO, Mid-America Regional Council, and Maryland SHA.

LEADING AGENCY PRESENTATIONS

Washington Perspective

Sreenath Gangula of Washington State DOT presented on WSDOT's mobility initiatives and data management techniques. He reviewed how MPOs and transit agencies work with WSDOT on the Corridor Capacity Report. The partnerships with universities, municipalities, and other agencies have been critical in delivering WSDOT's performance reports. Sreenath also reviewed the tools, processes, and measures used by WSDOT.

WSDOT's mobility performance program, as described in the presentation, typically requires 2-3 individuals for about six months to assemble the information collaboratively with internal and external partners. Other WSDOT divisions and outside contributors devote a considerable amount of time to the system performance report as well.

Most of WSDOT's collaboration with MPOs and other partners is carried out through personal communication, so little formal documentation is available that describes how these relationships were built.

WSDOT has established external data access privileges through WSDOT servers for the Puget Sound Regional Council (Seattle MPO), the agency's largest partner, as well as other MPOs across the state. This was deemed the most effective method, as a large amount of data is shared between the two agencies. Another system used is TRACFLOW, hosted by the University of Washington. This system performance data is publicly accessible and is cleaned and ready to use. In other cases, the IT office at WSDOT provides access to MPO and other partner agency staff if data needs to be shared.

Much of the collaboration that WSDOT undertakes stems from Federal requirements, but WSDOT has expanded beyond the requirements themselves, and built a strong foundation for the interactions necessary for fulfillment of the requirements. MPOs continue to want access to the data that WSDOT is developing (and vice versa), which requires a better system to be created for data sharing. Before that system can be built, however, WSDOT and staff at MPOs must continue to grow the inter-agency relationships in order to fully understand the needs and necessary tools.

WSDOT has been publishing its annual Congestion Report since 2001. However, in 2013, the agency expanded its analysis to include various travel demand management strategies and published its first multimodal Corridor Capacity Report. The level of coverage this report attracted from the media and the public was encouraging and reinforced the WSDOT vision for system performance measurement. The first inclusion of transit metrics in the report told the transit story to some extent, but transit agencies saw future reports as an opportunity to amplify their story and really make the case for transit's importance and show its role in Washington's transportation system. This led transit agencies to reach out and engage with WSDOT staff to take advantage of future reports to tell the broader story, and collaboration was a means to this end.

A list of questions and answers from this presentation can be found in the Appendix.

Oregon Perspective

Rich Arnold and Denise Whitney-Dahlke of Oregon DOT placed transportation data within a national context before discussing the organizational and system structures within ODOT that allow for data management and use, including PORTAL (discussed below) as well as traffic flow maps. The Transportation Planning Analysis Unit is responsible for travel demand models, HERS-ST, and sketch planning tools, and the agency has a data-sharing agreement with Waze. ODOT is in the process of developing a strategic data business plan.

Jeff Frkonja of Metro (Portland MPO) discussed Metro's current data management approach, institutional arrangements, and emerging factors. He provided examples of how data is used, including the Mobility Corridor Atlas that displays existing conditions of transportation facilities (e.g. traffic volumes and crashes), land use, and demographics. He discussed the data repository called PORTAL that is hosted by Portland State University and used by a variety of transportation agencies. He observed that Metro's Research Center is now beginning a comprehensive strategic review to scope how it will fund, implement, and apply a transportation system monitoring program that acquires and analyzes observed data in a sustainable way.

Metro now obtains data from ODOT via the PORTAL repository and also directly from partner agencies including TriMet (the regional transit provider) and local jurisdictions. Regional TIP money, with supplementary sources, funds the PORTAL initiative which is advised by a multi-agency committee. Working within existing resource constraints, Metro is looking to develop new sources for system data including private provider data streams that ODOT is

purchasing, new inter-agency data exchange mechanisms, and (possibly) crowd-sourcing options. Metro's intent is to enhance data sharing initiatives, ensure long-term sustainability of its system monitoring program, and deliver planned and desired monitoring information products to its stakeholders.

A list of questions and answers from this presentation can be found in the Appendix.

BREAKOUT SESSIONS

For each breakout session, participants formed three groups of approximately 10 individuals each. Groups for Parts 1 and 2 were different to encourage sharing across as many individuals and agencies as possible.

Part 1: Assembling and Managing the Data

Part 1 discussion focused on current approaches, challenges and potential improvements related to assembling and managing data for performance measurement. Discussion included staffing needs, sourcing options, coordination mechanisms for data sharing, integration of multiple sources/formats, and data coverage and quality, etc. The lists below summarize the information gathered from those breakout discussions:

Summary of Challenges Discussed:

- Maintenance of data collection equipment.
- Quality of data collection equipment.
- Lack of trust in Bluetooth loop detectors.
- While data and tools may be available, it remains difficult to draw valid conclusions within a fraught political environment.
- Quantifying performance on arterials.
- Harnessing private data in a cost-effective manner that allows full use and sharing.
- Changing technology impacts on staff skills training, as well as the capability of organizations to keep up with technology improvements.
- Changing technology limits longitudinal comparability.
- MPOs need data at more granularity to be effective.
- Joint DOT and MPO activities are not always well planned or consistently funded.
- Quality control is a major issue and is especially important because publicly reported data must be defendable.
- The significant risk of losing public trust because of poor quality data. This holds true for private data as well.
- Developing an approach that works for all identified needs within the agency as well as across agency partners is a significant challenge.
- Standardization of data.
- Capabilities, which are determined by staff skills.
- Partnerships with private data providers. These can restrict control, preventing sharing among agency partners.

Summary of Current Approaches/Potential Solutions Discussed:

- Traffic management data centers can be used to make other decisions.
- Partnerships with universities can assist agencies in data collection and warehousing.
- Universities also can help agencies understand new data management techniques and act as conveners.

- Recruit data science staff with the ability to bridge the gap between transportation and engineering.
- Statewide models are being developed that seek to address challenges, but come with their own challenges.
- Nevada Business Intelligence Enterprise: effort to integrate siloed data and allow greater access to data for more efficient reporting, analysis, etc. in partnership with University of Nevada Las Vegas.
- Oregon DOT PORTAL: a shared, open data repository that stores freeway, arterial, transit, and other data from ODOT, some cities, some counties, TriMet, and C-TRAN. It is hosted by Portland State University.
- With different areas of the department collecting similar information at varying levels, it becomes important to reduce duplicative efforts.
- When capabilities are lacking in particular areas, private data purchases may be appropriate.
- Data sharing agreements can help fill needs by coordinating across agencies and potentially reduce resource use.
- New partnerships can offer opportunities for improvement through access to more skills and data.

Part 2: Using the Data

Part 2 discussions focused on current approaches, challenges and potential improvements related to using available system performance data for performance measure calculations, trend analysis, diagnostics, target setting and monitoring, and decision making/program adjustment. This included data exploration and reporting tools, cross-agency collaboration to pool technology and staff resources, coordination on reporting processes, adoption of new practices and methods, etc. The lists below summarize the information gathered from those breakout discussions:

Summary of Challenges Discussed:

- Agencies have too many measures, and this can be a result of incorporating more stakeholders who each have suggestions for measures to use.
- How to make measures simple enough to be communicated effectively.
- Resistance to change among staff.
- Lack of storytelling/communication abilities, especially to decision makers.
- Getting buy-in from the public is a challenge when communication abilities are lacking.
- Long term target setting: how can data be used to make decisions that will positively shape a region?
- Small MPOs typically don't have the staff to address a lot of the important issues.
- How to model using realistic travel boundaries, and how to calibrate the travel demand model appropriately.
- Continuity in reporting as data sources measure things slightly differently.
- Selection of the most appropriate measures to quantify mobility; there are a number of possible measures to choose from.

Summary of Current Approaches/Potential Solutions Discussed:

- Thematic mapping, such as a congestion map with segments colored according to volume-to-capacity ratio or average speed.
- Aggregate measures, such as miles of congested freeways and total delay.
- Tabular data, such as tables showing measures over or under a defined threshold.
- Consider vehicle miles traveled per capita, non-auto mode share, aggregate trends by corridor reported annually, and ITS asset tracking measures.
- Some agencies use level of service letters as targets, and others use travel time index.

- Few agencies currently identify problems using data, but bottlenecks, pavement problem areas, and arterial congestion within the central business district (for transit investments) were a few of the identified issues currently being assessed using data.
- Current targets included greenhouse gas reduction (set by law) and vehicle hour delay reductions.
- Tie funding to performance.
- Avoid stifling innovation.
- Find more creative ways to communicate. A color system like the air quality warning system might be helpful for effective reporting of performance results.
- Create space for understanding what others are doing within the agency.
- Ensure resources and funds are available to make sure staffing and skills are up to current practice and technology.
- Leverage existing user groups to help spread the word about positive developments.
- Agencies can bring in a large number of people with new skills and ways of thinking to address the new reality and technology, motivating existing staff to adapt as well.
- Pooled funds can help cooperatively address issues and develop measures.
- Agencies need to think like businesses to use data for proactive investments that will support economic development.
- MPO consortiums, such as in Oregon, can help MPOs solve problems collectively by working through new rules and reduce resource use by sharing data collection.
- It is important to have common data to prevent varying results from analysis of impacts during project evaluation, such as predicted toll revenue. Having one, agreed-upon result will make other processes more straightforward.

AGENCY ACTION PLANNING

After State-MPO pairings had time to create action plans, each group was asked to share a few highlights from their conversations during the exercise. An example of the exercise can be found in the Appendix.

State 1:

- Data management maturity level was higher, but congestion and mobility capability is still lagging.
- State commented that is rare that State DOT, locals, and MPO meet collectively to discuss data management.
- MPO is planning a visit to State DOT to meet with key data staff to further the discussion.
- Agencies are doing data management activities well, but separately; definite potential for leveraging resources.
- All congestion/mobility freight measures are on state maintained roads within MPO boundary, so it is essential to coordinate. This event was a start to those discussions.

State 2:

- Data governance is an area for improvement at both State and MPO agencies: State has started to implement data governance but has hit roadblocks, the MPO is more informal.
- One action item is to get executive action on data strategy and governance.
- The State DOT wants to show data and make it easier to explore.
- Annual data assessment was a helpful suggestion from another participant.

- Previous data governance effort at State DOT did not last, so maturity was lower than if that effort has been sustained. Goal is to restart and sustain this time.
- MPO shared dashboard that State DOT can use as a model.

State 3:

- The pair plans to improve coordination on data overall, and the first step is to understand needs. State DOT will likely lead this effort, but will include MPOs and transit.
- Data discovery effort could determine that some needs could be filled with existing bodies of data.
- Everyone seems to be in similar situations in terms of resource constraints, need for increased staff skills, and improved data management and usability capabilities.
- MPO has a long history with data management but mobility and congestion are difficult. Processes have been relying on the model but until this event, staff had not connected with the right people at the State DOT.
- There is a need to better communicate the value of a data and monitoring program because there is no advocacy group for diagnostic capabilities like there is for a particular bike lane, road, etc. There is a need to make the case for a robust diagnostic monitoring program.
- Smaller MPOs have few issues with "siloed" business processes.
- The pair may create a modeling/data user group to keep data improvement moving forward.
- A statewide alliance of MPOs is a good model for solving technical items, but policy issues are more difficult.
- Data quality assurance programs are extremely important because trust can be lost quickly if data is shown to be inaccurate.
- It is important to make data meaningful to others in the agency; otherwise data efforts risk becoming an exercise only.
- The action planning exercise was valuable.

State 4:

- Efficiencies were a major focus for the two agencies. How can work be split up/how can data systems be set up to avoid duplicative efforts?
- It was helpful to hear that everyone faces the same issues.
- Because of lack of integration and coordination within the State DOT, the agency is hiring a new person to address this issue. This came about from a few champions among the staff who then obtained senior management support.
- To reduce duplication, a comparative data discovery exercise would be helpful to see what agencies and silos are doing.
- The agencies plan to get private and probe data into Congestion Management Process (CMP) for freeways.
- A review of desires of customers may help to ensure data presentation is understandable and not overly complicated.

State 5:

- The state has many smaller MPOs that are often just one person. They have few resources, but are more agile and do not have the significant institutional barriers that larger agencies do.
- The issues being discussed at this event all relate to broader institutional issues that are more difficult to solve than technical issues.

- Having an awareness of what initiatives are being undertaken in other parts of the agency can provide opportunities to piggyback onto these other efforts to improve data capabilities.
- Communication of measures is very important; the WSDOT leading agency presentation provided great information.
- TPM practitioners need to be careful because many times measures presume a solution. Corridors should be assessed individually; the purpose of the corridor won't always be maximum throughput.

State 6:

- Documentation is lacking; there is nothing that spells out the entire data collection, management, and analysis process, though parts of the overall process are documented.
- The organization includes traffic operations, MPO, and transit. As a result, data has been structured in a way that it can be used by many different agencies.
- Look at traffic management centers and the people who work there as an opportunity for data-related improvements.

State 7:

- The pair is focused on data collection efficiency; while each agency has different constituencies to report to, the same data can be used.
- Often, an agency's decision to use a particular data source or tool will force other agencies to adopt those same practices for the sake of efficiency.
- Larger MPO tends to represent other MPOs with the State DOT, and smaller agencies are concerned about travel time data and being able to collect and report.
- There are different ways to understand mobility: people v. car movement and rural v. urban focus between different agencies.
- Policy paradigms are shifting toward allocating resources based on diagnostics. This is a major change and a challenge.

KEY THEMES AND STRATEGIES

Key themes emerged from the group and breakout discussions throughout the peer exchange:

- **Changing technology:** Technological advances are becoming more and more rapid, creating a major challenge for agencies as they attempt to use the most recent and valuable data collection and analysis methods available. In addition, new technology can be expensive; this is a particular challenge in an era of resource constraints. Related to this are staff skills. Ensuring staff are capable of understanding and using new methods and tools is critical to success. A new data collection system or analysis tool will produce little added value without staff capabilities. To address this challenge, agencies should provide opportunities for staff to learn about new developments and to attend trainings both internally and externally to improve overall agency performance. Recruit data science staff that has these new skills as positions open. When necessary, private data can reduce the need for new staff training. However, some challenges do arise with private data that should be considered.

- **Partnerships with external groups:** Universities were frequently mentioned as valuable partners in data collection and warehousing. Universities can also act as conveners, providing the opportunity for partner agencies and other organizations to coordinate and collaborate on issues of common concern. Agencies can also partner with universities on skills training as these organizations are often developing or aware of new technology.

- **Communication and reporting:** Effective communication to various audiences both internal and external was commonly mentioned as a challenge. Participants had a number of ideas for improvement, such as: tie funding to performance and think creatively about reporting mechanisms. One suggestion included the use of a color system like the air quality scale to report performance results. Thematic mapping was also suggested. The WSDOT Corridor Capacity Report was held up as a good example of joint reporting by partners; this approach can provide a more holistic perspective to report users.

- **Resource constraints:** Resource constraints affect all other elements of a TPM approach. Participants suggested a data assessment/inventory to determine where duplicative data collection efforts can be eliminated to reduce resource use. Coordinating with partners can also reduce data collection efforts, and data sharing agreements can formalize such coordination. For small MPOs, the Oregon MPO consortium was held up as a successful model for collaboration.

Participants identified areas where more technical assistance would be helpful in implementing improved data management and/or usability processes at their agencies.

- Aligning data formats and developing data strategy.
- Developing business plans and standards.
- Template/example document for data governance documentation.
- Examples of agency pairs that are successfully collaborating and have the process well documented.
- Strategies for implementation: how to leverage larger organization efforts to promote and improve data capabilities and collaboration?
- How can ITS people be blended into the organization so that these data skills permeate and take hold?
- Documentation on how National Performance Management Research Data Set (NPMRDS) has been performing over time: are people concerned about this dataset because of real issues with the data, or are issues within the expected range for datasets in general.
- What local efforts are underway to clean the NPMRDS data for use?
- How to shift policy to support improvements surrounding data capabilities?

Michael Nesbitt of FHWA concluded the peer exchange by emphasizing the importance of documenting things such as sources, how data is used, and who it is shared with. A data management plan is an excellent way to document these items so that institutional knowledge of processes and data management is not lost when individuals leave the agency. Michael acknowledged the need for examples and templates for data-related documentation, and will begin working with peer exchange participants to develop said templates. He also will push for assistance related to strategies for facilitating coordination within existing funding levels.

Chris Allen of FHWA commented on the value of conversations over breaks and lunch during these events and how data visualization is an important tool in analyzing data. Visualization can provide a new way to see the data and can help make quality corrections.

DeLania Hardy of AMPO and Matt Hardy of AASHTO both emphasized the need for transit to be involved in mobility and congestion performance discussions because transit plays an integral part. It will be important to consider mode-agnostic measures in the near future.

Other participant comments included:

- Data have four dimensions that must be addressed: quantity, quality, accessibility, and usability.

- North American Travel Monitoring Exposition and Conference (NATMEC) reinforced the idea that technology and data processes are constantly in flux and changing, and this results in significant uncertainty, especially when various data professionals are making contrary assertions.
- In the past, work has been reactive, and this event will allow the agency to be interactive and proactive in the future.
- Resources have not increased, but somehow agencies are expected to do more. The gap can be filled by innovating.

Appendix

AGENDA

Day 1

8:00 AM	Welcome and Introduction Michael Nesbitt, FHWA Jon Makler, ODOT Region 1 Planning Manager Matt Hardy, AASHTO Hyun-A Park, Spy Pond Partners
8:30 AM	National Perspectives Francine Shaw-Whitson, FHWA – Final Rules Chris Allen, FHWA – Data Integration Effort DeLania Hardy, AMPO – Opportunities and Challenges Anita Vandervalk-Ostrander, Cambridge Systematics – Operations Data Business Plan
9:45 AM	TPM Toolbox Frances Harrison – CMM, Self-Assessment Tool, Guide
10:15 AM	Break
10:30 AM	Leading Agency Presentations Washington Oregon
12:00 PM	Lunch
1:00 PM	Warmup Exercise
1:05 PM	Key Themes from Participant Questionnaires
1:15 PM	Breakout Sessions Part I: Assembling and Managing the Data
2:45 PM	Report Out
3:00 PM	Break
3:15 PM	Breakout Sessions Part II: Using the Data
4:45 PM	Report Out
5:00 PM	Day 1 Wrap Up and Instructions for Day 2

Day 2

8:00 AM	Recap of Day 1 Breakouts
8:15 AM	Exercise: Action Planning Using the Capability Maturity Model – Frances Harrison

10:15 AM	Break
10:30 AM	Key Takeaways and Identifying Technical Assistance Needs
11:30 AM	Peer Exchange Wrap-Up
12:00 PM	End of Day 2

PARTICIPANTS

Name	Agency
Jack Stickel	Alaska DOT & PF
Reese Brewer	Anchorage Metropolitan Area Transportation Solutions
Kim Carpenter	Anchorage Metropolitan Area Transportation Solutions
Rich Arnold	Oregon DOT
Denise Whitney-Dahlke	Oregon DOT
Jon Makler	Oregon DOT
Steve Callas	TriMet
Tom Kloster	Metro (Portland MPO)
Kim Ellis	Metro (Portland MPO)
Jeff Frkonja	Metro (Portland MPO)
John Mermin	Metro (Portland MPO)
Ray Jackson	Salem-Keizer Area Transportation Study
Paul Thompson	Central Lane Metropolitan Planning Organization
Sreenath Gangula	Washington DOT
Dale Robins	Southwest Washington Regional Transportation Council
David Coladner	Idaho Transportation Department
Sabrina Minshall	Community Planning Association of Southwest Idaho
John Selmer	Iowa DOT
Jim Appleton	Caltrans
Dave Vautin	Metropolitan Transportation Commission (MTC)
Dave Wresinski	Michigan DOT
Elisa Hoekwater	Macatawa Area Coordinating Council
Peter Aiyuk	Nevada DOT
Brian Hoeft	Regional Transportation Commission of Southern Nevada
Erik Sabina	Colorado DOT
Steve Cook	Denver Regional Council of Governments

Name	Organization
Matt Hardy	AASHTO
DeLania Hardy	AMPO
Anita Vandervalk-Ostrander	Cambridge Systematics
Michael Nesbitt	FHWA DC
Francine Shaw-Whitson	FHWA DC
Chris Allen	FHWA DC
Jasmine Harris	FHWA Oregon Division
Satvinder Sandhu	FHWA Oregon Division
Frances Harrison	Spy Pond Partners
Hyun-A Park	Spy Pond Partners
Chris Plano	Spy Pond Partners

WASHINGTON PERSPECTIVE – QUESTIONS AND ANSWERS

Q: What level of staffing is required to complete the work described in the presentation?

A: The processes typically require 11-12 individuals for roughly 6 months.

Q: How does WSDOT physically move data between partners like MPOs? Do you use a flash drive, shared drive, etc.?

A: Puget Sound Regional Council (Seattle MPO) can access drives directly. They are the biggest partner and share the most data so this process works well. Another system used is TRACFLOW that is hosted by the University of Washington. This data is publicly accessible and is cleaned and ready to use. In other cases, the IT office at WSDOT provides access to MPO and other partner agency staff if data needs to be shared.

Q: What is the political side of data management and usability? How does an agency go about creating a collaborative structure that works for this issue?

A: A lot of the impetus for collaboration stems from Federal requirements through various processes, and WSDOT builds upon those interactions. MPOs also want to use the data that WSDOT is developing, which requires a system to be created for data sharing. Before that system can be built, however, staff at MPOs must reach out to WSDOT and this can provide the beginning of an inter-agency relationship that will grow.

WSDOT published its first Corridor Capacity Report and transit agencies saw the level of coverage it attracted from the media and the public. The report told the transit story to some extent, but transit agencies saw future reports as an opportunity to amplify their story and really make the case for transit's importance. This led transit agencies to reach out and engage with WSDOT staff to take advantage of future reports for their own interests, and collaboration was a means to this end.

Q: Can WSDOT share documents about how relationships were built?

A: Unfortunately, nothing formal is available; relationships have not been formalized.

Q: Are travel times based on calculation or observation?

A: WSDOT is using real data/observation.

OREGON PERSPECTIVE – QUESTIONS AND ANSWERS

Q: What is ITERIS providing that is not available with NPMRDS?

A: They have an additional MAP-21 module they are trying to market.

Q: How did you develop agreements with Portland State and other universities? Is there documentation of these agreements?

A: Formal contracts exist with Portland State, but presenters were not sure of the particular terms. They suggested that John Mermin, another participant from Metro, might have more information about this relationship. Some of the contracts were modeled from the I-95 Corridor Coalition.

Q: With resource constraints, how is Metro expecting to undertake activities related to data management and usability?

A: Metro is looking to the state for new data streams that will enable some of the planned/desired activities, as well as for compliance purposes.

Action Planning Exercise

In this exercise you will identify 3-4 high priority improvements and develop a plan for implementation.

Step 1: Select level of maturity

For each subcomponent, use the Capability Maturity Model tables to select the level that best fits your agency pair. Fill in the matrix below for both agencies in your pair.

Step 2: Consider actions that apply to your agency pair

Use "Actions to move to next level" in third column of CMM tables, as well as ideas stemming from discussions during breakout sessions (separate handout) to jot down some potential actions for each subcomponent.

Subcomponent	DOT Maturity	MPO Maturity	Actions
C.1 Data Quality			
C.2 Data Accessibility			
C.3 Data Standardization & Integration			
C.4 Data Collection Efficiency			
C.5 Data Governance			
D.1 Data Exploration and Visualization			
D.2 Performance Diagnostics			
D.3 Predictive Capabilities			

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Step 3: Identify priority actions for improvement

Select 3-4 actions from the matrix and list below by subcomponent. Adjust them to reflect your agency context.

Subcomponent	Action

Step 4: Complete improvement evaluation form for each priority action

Use the "Data Improvement Action Plan" handout.

Data Improvement Action Plan

Data Improvement Action Item #1	
Action Item:	**Subcomponent:**
What is the problem we are trying to solve? How will this action help?	
How will you know if your action is successful? (e.g. tangible results, progress milestones)	
Responsibilities: Who should take the lead in implementing this action item? Who else should be involved?	
Key Issues to be resolved for implementation:	

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