

Integrating Highway Asset Management into Planning and Programming

Overview

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) hosted a two-day virtual peer exchange on integrating asset management into highway planning and programming. The peer exchange was held on Wednesday, November 1, from 1:00 PM to 4:00 PM, and Thursday, November 2, from 1:00 PM to 3:00 PM ET via a private Zoom link. The intent of the peer exchange was to share findings from a literature review, provide an opportunity to share notable practices, and identify remaining challenges for integrating asset management into highway planning and programming. The peer exchange was part of a larger initiative to identify notable practices to integrate asset management into planning and programming, which included the development of case studies on agencies with exemplary asset management practices and webinars to engage agencies from around the country on integrating asset management into highway planning and programming.

The peer exchange included 74 participants including hosts and speakers. Speakers included professionals specializing in highway asset management planning and programming from State Departments of Transportation (DOTs), and Metropolitan Planning Organizations (MPOs) around the United States. Participants included individuals from regional FTA offices, State DOTs, MPOs, and municipal governments from around the United States. Refer to the Appendix for details on the participants of the peer exchange.

Opening Remarks

Kenneth Petty, Director, Office of Planning, FHWA

*Tashia Clemons, Senior Transportation Specialist,
Office of Stewardship, Oversight and Management, FHWA*

Asset Management is an integral part of providing safe and reliable transportation options to the millions of travelers and passengers using FHWA systems. Asset management is defined as “A systematic approach to maintain and improve physical assets through engineering and economic analysis, with a focus on achieving a sustained state of good repair at the lowest practical cost.” Asset management goes beyond life-cycle management and maintaining a state of good repair. Asset management may be used to understand the current state of our highway systems and better communicate future needs to help meet user demand. The quality of data that asset management



provides is a tool that can help agencies meet performance goals and positively impact operating costs. Asset management plans can improve strategic decision-making, reduce safety risks, and secure necessary funding. The intent of the peer exchange is to provide an information-sharing platform for participants to share insights into new approaches for performance data sharing, setting performance targets, and coordinating with stakeholders. The goal of the peer exchange was for participants to leave with practical knowledge tailored to their agency's needs so that they may better integrate asset management into the planning process.

POLL QUESTIONS

What type of organization do you work for?

Responses:

- State DOT: 54%
- MPO: 26%
- City or County: 2%
- Federal agency: 19%
- Other: 0%

What is your primary job function at your organization?

Responses:

- Asset Management: 37%
- Long-range Planning: 37%
- Programming or S/TIP Development: 15%
- Modeling: 2%
- Other: 9%
 - Other responses included GIS and data programs.

How long have you been in your current position?

Responses:

- 1 year or less: 20%
- Between 2-4 years: 24%
- Over 4 years: 56%

Topic 1: Integrating Asset Management into the Planning Process

PRESENTATION SUMMARY

West Virginia Department of Transportation

Gehan Elsayed, Chief Engineer of Planning and Program Implementation at the West Virginia Department of Transportation (WVDOT), gave the first panel presentation. West Virginia has a population of 1.8 million people and has the sixth largest US Highway System, 90% of which is owned and operated by WVDOT. There are over 7,200 bridges statewide. The West Virginia highway system is maintained and improved by \$1.3 billion annually.

The WVDOT Division of Highways Planning and Program Implementation group includes TAMP oversight, Statewide Transportation Improvement Program (STIP) funding allocations, asset management systems, programming, and planning. WVDOT is actively tying the West Virginia Statewide Long-Range Transportation Plan and the STIP plan to align projects and plans to the agency's vision and goals. Continual review of the system by dedicated agency positions provides oversight and consideration of various funding scenarios to adapt and prepare for life-cycle asset management.

WVDOT considers the Long-Range Transportation Plan to be a family of plans that includes system and modal plans such as the TAMP, Freight Plan, and Highway Safety Plan. The trade-off analyses for asset needs in the Long-Range Transportation Plan were performed based on needs data and models, funding sources, programming principles, and targets from the TAMP. The trade-off analysis tool informs Long-Range Transportation Plan outcomes and implementation.

The investment scenarios in the TAMP inform project selection in the STIP. There is continuous feedback between the TAMP and STIP development. The TAMP was under development at the time of the recent STIP update. Similarly, STIP amendments to the bridge and pavement programs are anticipated based on TAMP findings.

Internal TAMP coordination is spearheaded through bi-weekly meetings with asset management groups, weekly STIP meetings, and bi-weekly development meetings. WVDOT also holds weekly leadership updates and quarterly district meetings to increase asset management buy-in agency-wide. WVDOT externally coordinates with the regional FHWA office, MPOs, and West Virginia Turnpike to keep stakeholders informed on the TAMP.

WVDOT is currently facing challenges with retaining TAMP staff and breaking agency silos. To combat these challenges, WVDOT is establishing a set of Standard Operating Procedures for integrated asset management, trying to shift agency culture by discussing other division involvement with asset management, increasing education and training for stakeholders, and recruiting new agency staff. WVDOT is considering equity by leveraging asset management best practices, moving to a data-driven approach, and taking advantage of life-cycle cost management to maximize taxpayer dollars.

Iowa Department of Transportation

Andrea White from Iowa DOT gave the second panel presentation. Iowa has a dense road system that is primarily county-owned. The state-owned highway system is 8% of all roads. Iowa DOT works with 9 MPOs, 18 regional planning affiliations, 35 public transit agencies, 99 counties, and 947 cities. External coordination involves the Metropolitan Planning Organization (MPO) planning process and agreements and supporting local agencies.

Almost half of the Iowa DOT planning chart is involved with highway asset management, particularly in the Transportation Development Division, Systems Operations Division, and Field Operations Division. The Transportation Development Division is involved in planning and programming. The Systems Operations and Field Operation Division is involved in asset management from a maintenance and engineering perspective.

TAM governance structure starts with TAM Systems: Bridge Management, Pavement Management, Safety Management, Traffic Operations, and Other Management Systems. These groups meet twice a month and are critical in forecast development. Leaders of TAM Systems teams and other key personnel meet as a part of the TAM Technical Committee. The next level is the TAM Implementation Team, which hires staff and coordinates with stakeholders. TAM Sponsors represent executive leadership, and the final level is the Iowa Transportation Commission.

The Long-Range Transportation Plan and the asset management plan inform each other, particularly in defining projects. Iowa is working to increase the connection between the two plans. The most recent Long-Range Transportation Plan incorporated system objectives and rightsizing policy. Public outreach for the plan also identified asset management needs. The rightsizing policy creates clearly defined project guidance and includes ten policy areas, several of which directly relate to asset management.

Iowa DOT is building upon existing asset management and planning integration to better meet Federal requirements, particularly in agency governance. The agency has successfully increased the emphasis on stewardship and Iowa Transportation Commission buy-in. The TAM governance structure encourages collaboration amongst TAM groups.

POLL QUESTIONS

To what extent is transportation asset management integrated into your agency's overall transportation planning process?

Responses:

- Very highly integrated: 0%
- Highly integrated: 33%
- Somewhat integrated: 54%
- Not very integrated: 8%
- Not sure: 5%

Are any of the following planning goals or factors integrated into your agency's asset management program?

Responses:

- Safety goals/considerations: 33%
- Mobility or reliability goals/considerations: 28%
- Equity goals/considerations: 8%
- Environmental goals/considerations: 8%
- Other goals or planning considerations: 23%

DISCUSSION

Moderated by Charles Pilson of Mott McDonald

Question from the moderator: What are some challenges with integrating asset management?

Response: A participant identified carving out enough funds from the greater budget as a challenge.

Response: A participant said it is challenging to get politicians and elected officials on board when asset management is often not as compelling as new projects.

Response: Another participant struggles with getting data from member agencies. Often, asset management and modeling are subject to the data quality of smaller municipalities and agencies.

Response: A participant is working to evolve established governance now that the asset management program involves more asset classes and Federal requirements. The participant also struggles with integrating separate planning processes.

Response: Another participant found a gap between needs and resources as a regional office.

Response: A participant struggles to integrate safety plans.

Response: Another participant finds difficulty meaningfully contributing to the asset management conversation as a non-asset owning MPO.

Response: Another participant struggles with a continued lack of funding and continued pressures to show progress in goal areas.

Response: A participant finds difficulty integrating periphery considerations such as safety, environmental, and equity considerations into asset management.

Response: Another participant replied that while communication is key to integration, many people do not view it as important work.

Question from participant: How are other groups incorporating local priorities into the asset management process?

Response: A participant responded that the asset management program is decentralized. Districts develop their own planning and programming priorities.

Question from participant: How have panelists initiated their asset management program and how do they keep track of data?

Response: Elsayed responded that the WVDOT has been working on asset management reports for a long time, but the official start of the TAMP was a result of the federal requirement. The operations division keeps track of data for bridge and pavement management.

Response: White responded that Iowa DOT has a similar process. Pavement data uses Deighton's dTIMS infrastructure asset management software and an in-house management tool. A consulting team helps collect data.

Question from participant: Why should integration of asset management and planning be a priority?

Response: The participant represents an MPO that oversees over 100 transit agencies and their asset management plans. They are working to better incorporate plans and targets into the regional transportation plan. The participant found little guidance on how to focus investments to help achieve targets within planning horizons.

Response: Jonathan Fok from Washington State DOT responded that the capabilities of urban and rural transit agencies can be very different. Washington State DOT has some competitive grant programs only for rural agencies to help achieve targets.

Question from the moderator: How do you reconcile different planning horizons from different agencies and plans?

Response: A participant responded that planning often has longer time horizons and different priorities. Asset management can be counterproductive to planning efforts without integration and collaboration.

Topic 2: Data Analysis / Scenario Analysis

PRESENTATION SUMMARY

Southeast Michigan Council of Governments

Michele Fedorowicz, from the Southeast Michigan Council of Governments (SEMCOG), gave the first panel presentation. SEMCOG is the Detroit area MPO and includes over 4.75 million people, which is roughly half of the state's population. SEMCOG is currently updating the long-range plan, Vision 2050. SEMCOG performs outreach to define goals, which feed into asset management plans. SEMCOG's Vision2050 also informs the state TAMP and TIP. Asset schedules are linked to project selection and coordination.

Michigan legislation supports TAMP efforts on state, county, and city levels. TAMP elements include asset data inventory, performance goals, risk of failure analysis, anticipated revenues and expenses, performance outcomes, coordination with other entities, such as water/sewer/utility, proof of acceptance, and multi-year programs.

SEMCOG works with local government agencies to build on asset management plans, to build treatment plans and coordinate with other municipal governments. Road agencies with over 100 miles in Michigan are required to submit a TAMP plan to the statewide Transportation Asset Management Council (TAMC). This plan is valid for three years and focuses on roads and bridges. TAMC provides templates, support, and training.

SEMCOG works to link asset management into planning through a focus on preservation throughout all plans. SEMCOG encourages a mix of fixed approaches to ensure the right fix happens at the right time, considering poor conditions and highly utilized roadways. Preservation requires infrastructure coordination, especially with water/sewer.

SEMCOG created the Capital Improvement Project (CIP) Coordination Tool. Projects can be voluntarily uploaded to the interactive mapping and planning tool. Road pavement and bridge conditions are also monitored and reported. The Michigan TIP has a first-come first-serve process for funding. SEMCOG is the agency responsible for the TIP.

Colorado Department of Transportation

Toby Manthey, the Asset Management Program Manager at Colorado DOT (CDOT), gave the second panel presentation. CDOT has a total budget of \$2 billion and the asset management budget is \$800

– \$850 million. CDOT assets include 23,016 pavement lane miles, 3,464 bridges, 5,946 culverts, and 20 tunnels.

The asset management program is within the planning division and has been in place since 2012. There are 12 asset classes: tunnels, traffic signals, pavement, walls, culverts, buildings, fleet, maintenance levels of service, geohazards, bridges, ITS, and rest areas. All asset classes have asset managers who are scattered throughout CDOT. The centralized TAM program determines budgets, develops treatment lists, meets Federal requirements, and helps develop National Performance Measure targets.

The budget is determined at an annual budget workshop with an executive committee. Before the budget-setting workshop, the CDOT TAM program holds an asset management summit with presentations from all 12 asset managers to provide decision-makers background before setting the budget. At the budget-setting workshop, each executive is given information on budget requests, request needs and justifications, performance and funding history, and scenario analyses of budget and performance for each asset class. The executive committee must come to a consensus on the budget.

Scenarios are run for each asset class. CDOT runs multiple budget scenarios: do nothing, current budget, plus/minus scenarios, and change investment strategies. The scenarios play a key role in budget decisions. In addition to general budget scenarios, five distributions between asset classes were modeled for the recent budget: funding all assets at a minimal level, funding all assets at 63% of the cost to achieve the target, funding more preventative maintenance for bridges through policy change, targeted funding distribution to individual asset classes, and dedicating additional funding to interstate pavement. Scenarios are selected at the request of executives or the recommendation of the TAM team and based on information from asset managers.

The final distribution scenario – to dedicate increased funding to Interstate pavement – was selected, largely as a result of a potential Federal penalty. The asset management budget has largely remained static, so funding for each asset class has remained steady, with the exception of the increased Interstate pavement funding.

Difficulty in setting the budget has led to a desire to use algorithms to determine it, but current programs do not provide reasonable recommendations. Another challenge is ad-hoc funding toward asset classes not done through the TAM program or budget.

POLL QUESTIONS

Does your organization conduct scenario analysis as part of long-range planning or asset management planning?

Responses:

- Yes – I am involved in this analysis work: 40%
- Yes – I am not involved in this work: 15%
- No: 25%
- Unsure: 20%

DISCUSSION

Moderated by Michael Grant of ICF

Question from the moderator: What challenges do you face conducting scenario analysis as part of long-range planning or asset management planning?

Response: Another participant identified estimating available funds as a challenge.

Response: A participant found forecasting unexpected cost increases to be challenging.

Response: A participant has difficulties figuring out the right long-range cost, especially with recent construction cost inflation.

Response: A participant has trouble narrowing down the number of scenarios.

Response: A participant is just starting an asset management system and has a limited scope.

Response: Another participant struggles to estimate project benefits.

Response: Another participant has challenges identifying how asset conditions may be impacted over the longer term by climate change, heavier vehicles, changing travel demand, emerging technologies, funding sources, and other factors.

Response: A participant faces challenges in accessing state-collected data, which is limited in its focus on pavement and bridges on state roads.

Response: Another participant has difficulty using programs to perform reasonable scenario analysis and predict budget variations from year to year.

Question from the moderator: Why and how is the MPO involved in data collection? Best practices or experiences?

Response: A participant noted the MPO collects data on highway assets owned on a local level.

Response: Another participant found that pavement and bridges have established data collection programs. For smaller assets, the MPO had to start the program and perform an inventory over time.

Response: A participant from Iowa said the Iowa Pavement Program provides support to all local agencies who want to advance pavement management practices. The state funds the collection of data on a four-year cycle and locals are encouraged to use their own funds to collect data in other years by piggybacking on our state data collection contract.

Question from a participant: Are any DOT/MPOs/Cities looking at collecting asset data on sidewalks or bike infrastructure?

Response: A participant said the MPO is collecting sidewalk asset data for the city, but the data will be maintained by the city in the long-term.

Response: Another participant is just starting to discuss adding new asset classes with the executive team.

Question from the moderator: What are agencies doing for scenario analysis?

Response: A participant is performing bridge and pavement funding scenario analysis but has challenges with anticipating funding due to ad-hoc projects.

Response: Another participant only does a baseline number of scenarios because the executive steering committee asks for over 20 scenarios and cannot prioritize amongst them.

Response: Manthey said that CDOT's scenarios are narrowly bracketed, although they do run quite a few scenarios for each asset class. The TAM program practice is to run many scenarios to have the results on hand when they are requested.

Response: Elsayed said that WVDOT runs nine scenarios for the TAMP and a sensitivity analysis.

Question from the moderator: Is anyone looking at scenarios for external factors, such as climate change?

Response: A participant noted that North Dakota recently gave a presentation on scenario planning and external factors.

Question from the moderator: Is the target-setting practice helpful for asset management and for linking the TAMP with other plans?

Response: A participant noted that the Federal framework is short-term, and it is difficult to manage asset management programs based on two- or four-year programs.

Response: Another participant noted a gap between targets at the system level and projects at a facility level.

Topic 3: Integrating Asset Management into the Programming Process

PRESENTATION SUMMARY

Delaware Department of Transportation

Pamela Steinbach from the Delaware Department of Transportation (DelDOT) gave the first presentation of the second day of the peer exchange. Steinbach is the Director of Planning at DelDOT, working on asset management. DelDOT is the second smallest state with a population of just under one million. DelDOT maintains 90% of roads and bridges in the state. The agency manages an over \$4 billion Capital Transportation Plan (CTP), which is updated every two years.

DelDOT is an expanding agency and has two asset management directors for which asset management accounts for about 10–20% of their work. The agency plans to add a full-time Asset Management Program Director to focus solely on coordinating asset management. The agency aims to transition its asset manager's mindsets regarding asset management from being "reactive" to "proactive."

DelDOT's next Long-Range Transportation Plan update is slated to be completed in 2024. The agency has \$4 billion in funding and 109 projects on its program list. Notably, roll-ups are utilized for greater flexibility in programming. Otherwise, toll funds and the gas tax make for a stable financial source for the agency's programming needs.

Steinbach shared a summary of DeIDOT's state of good repair (SOGR) sheets showing the SOGR sheet status of the different asset classes, indicating if the SOGR sheet is "Complete" or "In Progress." DeIDOT starts the SOGR summary development by collecting data on the smaller asset classes. Currently, the agency maintains a master list of assets, associated classes, asset size (or Tier), and associated actions.

Steinbach noted a couple of key practices DeIDOT uses to effectively communicate with upper management. In the "Recommended Investment Strategy" section of the TAMP, DeIDOT forecasts pavement conditions and generates investment scenarios to meet a SOGR for their assets. Forecasting pavement and bridge conditions over a decade helps visually communicate future conditions for specified investment scenarios and funding needs to upper management. Understanding and funding requirements for long-term conditions is crucial, given the rising costs associated with pavement and bridge engineering and inspection. DeIDOT also utilizes SOGR summary "fact sheets" for upper management to understand the predicted performance for different budget scenarios for all asset classes. Upper management at DeIDOT finds these SOGR sheets invaluable for informing cross-asset decision-making.

DeIDOT partners with MPOs, and transit providers to track asset conditions across the state. DeIDOT has 1,780 bridge structures, 340 (19%) of which are on the National Highway System (NHS). Asset managers must differentiate NHS and State assets and work with partners to understand asset conditions. DeIDOT also conducts quarterly meetings with all stakeholders and emphasizes an open line of communication with their partners.

The more recent asset management practice at DeIDOT includes consistency reporting and considering asset resiliency and equity in decision-making. In 2022 DeIDOT had a TAMP update. Like all states, DeIDOT also develops a consistency report annually showing the difference in planned spending identified in the TAMP and actual spending for pavements and bridges. Resiliency is at the forefront of asset management in Delaware as the state is low-lying and often experiences sunny day flooding. DeIDOT uses an equity mapping tool to track how vulnerable populations are impacted by asset management decisions.

Steinbach acknowledged the uphill journey in promoting asset management within DeIDOT, emphasizing the shift from a checkbox mentality to a proactive demonstration of informed decision-making to executive leadership. The agency is actively expanding its asset classes, incorporating a risk register, engaging in peer learning sessions, and transitioning towards more comprehensive asset programming to enhance efficiency and effectiveness in highway planning and programming.

Delaware Valley Regional Planning Commission

Brett Fusco from the Delaware Regional Valley Planning Commission (DVRPC) gave the second presentation on the second day of the peer exchange. Fusco is the Associate Director of Comprehensive Planning at DVRPC and primarily focuses on project evaluation and programming. DVRPC is the MPO for Philadelphia, Pennsylvania, and its surrounding counties. DVRPC is a relatively large organization and is slowly growing. The MPO serves around 5.7 million people and supports 100 million Vehicle Miles Traveled (VMT) and one million transit trips daily. Fusco noted that this mature transportation network has a large backlog of system preservation needs.

As a large MPO, DVRPC manages many different moving parts. The financial planning team supports the Office of Long-Range Planning, and the Office of Capital Programs. The offices are respectively responsible for developing the Long-Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP). Both offices work consistently on performance-based planning and programming by developing tools that are guided by the plan's goals.

Equity is a core principle of DVRPC's LRTP. At the outset of each update, the agency conducts a system-level equity analysis to understand where there may be undue burdens placed on environmental justice (EJ) population groups. First, they identify EJ community locations and then compare asset conditions to other locations within the DVRPC service area to see where there may be disparities. This information is used to inform project identification.

To aid in project identification, DVRPC issues a call for projects early in the update processes for the LRTP and the TIP. Project sponsors provide information on a project via an intake form. The projects are screened based on core principles such as equity, resiliency, and sustainability and then evaluated based on specific evaluation criteria such as Federal Transportation Performance Management (TPM) targets, geographic equity, regional and local priorities, political support, funding eligibility, project readiness, etc. Based on the evaluations, the DVRPC board selects projects to include in the TIP and LRTP. DVRPC coordinates with partners including Delaware and Pennsylvania DOTs, transit providers, local governments, and Federal government partners to collect asset data which aids in the evaluation process.

Once projects are selected, a system-level equity analysis is conducted, which compares the selected projects to EJ communities to guarantee that no undue burden is placed on these communities and that they are receiving a fair share of investment. The evaluation process helps distribute the limited funds available to the most critical transportation projects.

DVRPC has intentionally integrated the LRTP and the TIP process, with the goal of creating a singular financial plan. Fusco noted that the evaluation criteria are complex and multifaceted, and communicating the evaluation process and outcomes to decision-makers and the public remains an ongoing challenge. Outreach efforts to EJ communities to better understand transportation needs and preferences are also ongoing at DVRPC. The outcomes of this outreach include a report on Mobility Choices and a Supporting Communities program in which DVRPC works with historically marginalized and disadvantaged communities to build a project pipeline.

DVRPC aims for continual improvements in project evaluation while reflecting on Federal TPM targets. DVRPC's system-level analyses provide checks on programming equity aided by a formal project identification process to achieve long-range goals and in-house/partner tools for performing evaluations.

POLL QUESTIONS

To what extent is transportation asset management integrated into your organization's STIP, TIP, or other programming processes?

Responses:

- Very highly integrated: 0%

- Highly integrated: 31%
- Somewhat integrated: 55%
- Not very integrated: 14%
- Not sure: 0%

What challenges do you face in integrating asset condition performance or TAMPs into S/TIPs or other programming processes?

Responses:

- Coordination between different governments and agencies.
- Integrating rolling stock assets for transit versus other "fixed" assets (like bridges).
- Our capacity projects, which make up a good portion of the STIP, don't always consider the condition of the assets.
 - Not every department/division can get involved in capacity project developments. Hard to get the big picture of asset management. Capacity projects do not consider asset management planning. Maintenance cost not considered. State of good repair = good roads cost less, which means prioritizing frequent small improvements. Planning and design need to include maintenance planning across different asset classes.
- Resources and staff to implement and integrate.
 - Trying to get support behind integrating asset management, challenges with staffing capabilities and resources.
- Coordination between the different divisions.
 - Things always fall through the cracks during the STIP process. Consistency reports always produce issues. Emphasis on continuous coordination.
- Capture decision-making and make sure things get programmed accordingly.
- There are numerous issues with tying the TIP/STIP to the TAMP and the performance metrics. Tenth-mile segmentation used in Federal reporting doesn't tie back directly to logical project limits, inflationary pressures may hit the STIP but aren't reflected in the Asset Management projections, etc.

DISCUSSION

Moderated by Charles Pilson of Mott MacDonald

Question from the moderator: Do you have a process to ensure consistency between TAMP and STIP?

Response: A participant noted that their agency is fairly consistent, but they don't dive deep. They submit information in an off-hand way.

Question for Steinbach: What kinds of efforts does DelDOT use to develop plans for frequently underfunded assets?

Response: DelDOT is working to identify those assets and assess the severity. They use sensors and boots on the ground to assess assets vulnerable to natural hazards.

Response: Pilson noted that bringing risk and resilience into asset management is extremely important. The benefits of doing something to reduce risk are possible to quantify.

Question for Fusco: DVRPC has different criteria to evaluate different assets. How do you pull in improvement impacts?

Response: Fusco noted that it used to be the worst first condition. DVRPC is now looking at projects and scope and timing, trying to get more at cyclical nature and life-cycle costs. The agency worked closely with PennDOT and used their models. They compare capital project recommendations from the PennDOT model. They face challenges with timing candidate projects.

Question for Steinbach: Your TAMP outlines processes and asset management operating procedures. Can you elaborate?

Response: It is important to create a type of document, so everyone is on the same page in terms of roles and responsibilities. The document should outline what separate groups are supposed to do and give overall information on asset management.

Hot Topics Breakout Session

In the last 30 minutes of the peer exchange, the hosts opened three breakout rooms to discuss three different topics including Communicating Tradeoffs in Asset Management Planning and Programming, Engaging MPOs and Local Agencies in Asset Management, and Incorporating Resilience into Asset Management. There were two 15-minute breakout room sessions hosted by the moderators and speakers. Participants selected which breakout room they wanted to join in for each session based on their agency's primary needs.

GROUP 1: COMMUNICATING TRADEOFFS IN ASSET MANAGEMENT PLANNING AND PROGRAMMING

Session 1

The moderator asked participants about their experience with communicating asset management tradeoffs with their organizations.

Response: A participant mentioned that rural roads are not being maintained to the same degree as urban roads.

Response: A participant responded that this initiative came out of DOT and presented it to the legislature. A good portion of the state is rural.

Response: Elsayed noted a similar situation at WVDOT. They sorted the secondary roads – and always had complaints about them. They presented the case to the legislature. We received \$50 million initially, and last year, we got \$100 million.

Response: Manthey noted they forecast and show assets. People can get complacent and used to seeing them. When you say there will be a drop-off in 10 years, you must know/be able to show it is true, or people will not trust you. Manthey is not just showing the model curve but also pictures of what happens when a culvert fails. Sometimes, real-life examples are needed.

Response: A participant noted one of the challenges they have is similar to Manthey. They tell partners about poor conditions and what needs to be done. When they see graphs showing the goal is 60% and we are at 58%, they think we are doing well. But if they do not maintain above that level, it will deteriorate faster. UDOT needs people to understand why the money is needed.

Response: Manthey added that when you only pay attention to the poor condition assets, people do not pay attention to the good. The population is shrinking, which is a challenge. CDOT had this issue with culverts, too, being close to achieving culvert percentage goals but still had failures. Poor goals can hide the true picture of what is happening.

Response: A participant is trying to quantify the risk – not just financial but public risk.

The moderator noted that trading off between programs can be tricky and that you can test tradeoffs with different scenarios.

Response: Elsayed did a lot of trade-off scenarios. Very restricted by bridge conditions. The pavement conditions were relatively very good compared to bridges. So, the proposal was to allocate funding from pavement to bridges – but it was not well-received. There were hard discussions with leadership. Bridge work is restricted by funding, and they are currently under penalty. For the public, the pavement is the most important part. Elsayed added one scenario to scale down the target. The previous target was hard to achieve with the level of funding they had.

Response: A participant sees it as more of a preservation than a construction deal. Have projects for each budget partition. A lot of the time, projects come from phone calls they are getting. It is hard to tell them, “Let’s not do worst first,” and maintain what we have. They must tell them why this will make progress go further.

Session 2

The moderator asked participants about their experience with communicating asset management tradeoffs with their organizations.

Response: A participant noted that the agency struggles with asset management, and it becomes an emotional rather than logical process. It comes down to comparing apples and oranges. Even before communicating, it’s important to make sure that the tradeoffs are very clear and that data is informed. Data-informed decisions come first, then figuring out how to communicate that information. It is important that when they have metrics, they agree that these metrics tell the story. Sometimes, there are “behind the scenes” metrics that show a different story or show it’s not really what the data means.

Response: A participant acknowledged that they are a smaller state. They had a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis recently as part of the maintenance and asset management team. The program was \$35 million and after the SWOT analysis moved up to \$60 million. By improving low-volume roads, they are going to improve the performance measures.

Response: A participant noted that they are just now bringing on the first MPO. The participant asked if others had any advice on how to bring an MPO on board and create a transit asset management plan or anything related to asset management.

Response: A participant from FTA said he would send the participant the TAM Plan guidance.

Response: A participant mentioned that their biggest challenge with consistency reviews is communicating why tradeoffs were made. Communicating with the FHWA Illinois Division has been a

challenge. More specifically, the biggest challenge is communicating ticking time bombs with the FHWA Division office.

GROUP 2: ENGAGING MPOS AND LOCAL AGENCIES IN ASSET MANAGEMENT

Session 1

Question from the moderator: What issues are you facing in terms of the role of MPOs or local agencies in asset management?

Response: A participant mentioned that in their jurisdiction, some MPOs have rural areas. Getting those MPOs in alignment with prioritization is a challenge. The participant asked how others are addressing rural areas.

Response: A participant mentioned that when it comes to asset management for funding programs, they administer federal funds, and they are split up by project type. Road preservation and construction must be consistent with guiding principles and prioritize lower-level rehab and preservation. They also look at regional transportation significance. They do not look at rural or urban areas but just measure priority.

Response: A participant noted that they have a lot of rural areas in their jurisdiction.

Response: A participant responded that their MPO is completely rural. States have divided out rural chunks and focused on that.

Question from the moderator: Among your organizations, has your State DOT worked well with MPOs?

Response: Fusco mentioned that when they make a call for projects, asset management isn't the first thing they think about. They prioritize system expansion projects and then think about system preservation.

Session 2

Question from the moderator: How are your agencies thinking about asset management on a regional scale? Are there any issues at the MPO or local level?

Response: A participant mentioned that they hosted a local government workshop. They gave the participants a snapshot worksheet, then analyzed their local assets for the STIP, and then gave that analysis to them. They intend to conduct this workshop every four years. They need to know how the local governments intend to spend their money and need to track their consistency and report that as well.

Response: Gathering information from MPOs and local governments proves challenging.

Response: A participant mentioned that their state DOT puts a newsletter together, including data and resources for MPOs and local governments to help when they review targets with their respective committees. They also conduct webinars to explain asset management principles.

Response: The most challenging activity is translating data into a pavement management strategy.

Response: Usually, there is a pavement analysis with definitive data points you can use.

Response: Fusco asked the group what data they use and if it's system level or project level. Data can help move the needle, and it is important to know how you want to use it.

Response: A participant responded that their end goal is to create an area that stakeholders can feel comfortable with. A lot of MPOs talk about performance management once per year.

GROUP 3: INCORPORATING RESILIENCE INTO ASSET MANAGEMENT

Session 1

The moderator asked the participants how their organizations incorporate resilience into asset management.

Response: A participant explained that resilience in asset management has revolved around natural hazards. Risk and resilience are intertwined. He asked how we can go beyond that and be resilient to other risks. Natural hazards are good practice. Funding, political, and natural degradation risks.

Response: Steinebach noted that DelDOT has stable funding. Since Delaware is small, the legislature is generally always blue, but they always want infrastructure. Politicians are highly communicative with DelDOT, and DelDOT is consistently responsive.

Response: A participant noted that there are issues with increasing needs and unstable funding. Balancing different needs.

Response: A participant noted that they spend a lot of time trying to make the case that they are underfunded. The TAMP emphasizes that they cannot use state funds for the NHS. They are trying to find unmet needs to make a case. They used asset management tools to project future conditions, and there are concerns.

Response: A participant asked how we model climate refugees.

Response: A participant asked how we adapt to population changes.

Response: A participant noted that this is an interesting point; we might have increased urban density if people leave rural areas due to drought.

Response: A participant mentioned a massive influx of distribution centers being built, and roads are not able to handle the increase in traffic. What about resilience to increased truck traffic?

Response: A participant explained that adding weight and motion sites to monitor increases in freight traffic.

Session 3

The moderator asked the participants how their organizations incorporate resilience into asset management.

Response: A participant is having to address infrastructure that has been affected by extreme weather but does not have other issues. New standards to increase hydraulic opening are increasing costs. They asked if other people were running into the same issues.

Response: A participant confirmed that they are having some similar challenges.

Response: Steinebach said that DelDOT has not had many changes in engineering plans due to weather. They used to do a planning level estimate of a project that would go onto the Capital Transportation Program (CTP). However, the actual costs vary. DelDOT would put estimated costs into CTP that would be inaccurate, which led to a series of kicking the can down the road. Preliminary analysis would frequently be a much higher cost. The CTP now only includes project development costs.

Response: A participant mentioned that they are just starting to consider resiliency. Recent storms have been impacting moveable bridges. Not a good grasp of how to replace or improve moveable bridges. Just raising the bridge is not accurate.

Response: A participant said they are developing a resiliency plan looking at software solutions that pull in different factors, quantify risks, and help prioritize funding.

Wrap-Up Discussion

After the hot topics concluded, the hosts brought all participants back to the main session, and the moderators posed a series of open-ended questions to the whole group. Participants unmuted and discussed the questions.

Question from the moderator: What support can FHWA/FTA provide to help you and partner agencies integrate asset management into planning and programming?

Response: A participant would like processes to facilitate collaboration with MPOs.

Response: Manthey seconded this. Especially collaboration on obtaining investment data for local investments (non-DOT) in the NHS and collaboration on obtaining data for twice-damaged assets for local (non-DOT) assets.

Response: Steinebach would like to see flexibility in targets, additional peer exchanges, and how to work with MPOs

Response: Fusco would like to see an update of the state of good repair definition for the lowest life-cycle cost approach, update thresholds, or use different data indicators than 5% / 10% of bridges/pavement in poor condition. The lowest life-cycle cost will naturally lead to a higher percentage of poor asset conditions.

Response: A participant would like resources and examples on asset management beyond state DOT-owned roads (local roads, pedestrian facilities, etc.)

Question from the moderator: Has your agency had success integrating asset management into planning or programming? What advice would you give to another agency?

Response: A participant mentioned that their Division office has suggested that, with their current bridge trajectories, the Division would be willing to support the agency by making a case for funding. This might mean telling the bridge story to the administration and legislature about what would happen if the bridges were closed.

Response: Pilson noted NCHRP 08-118 Tools and Techniques for Risk Management, which has just been published and is available on the National Academy of Sciences website.

Key Takeaways

Three topics addressing the integration of asset management into planning, data and scenario analysis, and integration of asset management into programming were discussed, as well as a session on specific 'hot topics' identified as part of the exchange. The sessions were well attended, and discussions during the sessions indicated a high level of interest in the overall subject. This was understandable since states have just submitted their 2022 updates to their transportation asset management plans (TAMPs), but maturity around implementing these plans to connect them with long-range and project-level programming is still developing.

Integration – The sessions uncovered some recurring themes as well as some specific observations. Polls taken during the sessions indicated that only a third of attendees (31– 33%) indicated their TAMPs were highly integrated, with none indicating they were very highly integrated. This highlighted the current challenge of taking high-level strategy developed in LRTPs into TAMPs and thereafter translating the planned investments into maintenance, preservation, rehabilitation, and reconstruction/ replacement identified in the TAMPs into programming-specific projects. Based on the presentations, best practice agencies are developing ways to meet these challenges, with a couple of agencies tightly aligning the LRTP and TAMP by extending the LRTP funding scenarios and analysis in the pavement and bridge management systems for use in the TAMP and then setting up standard processes to include the TAMP investment strategy in annual project development for use in the capital plan. The need for scenario analysis to evaluate tradeoffs between programs was a common theme. The Southeast Michigan Council of Governments (COG) created a specific Capital Improvement Project (CIP) Coordination Tool.

Coordination and Communication – Another common theme was the need for coordination and communication across multiple entities, both internal and external to the agency responsible for the asset management planning. The coordination discussion spanned from the need to actually include external asset owners' data in the asset management system analyses, to ensuring close coordination on asset management within an agency to ensure smooth transitions from long-range planning, through investment strategy plans in the TAMPs, to implementing these plans through programming. It was apparent from the peer exchange that this coordination requires dedicated asset management staff. State DOT asset management engagement was shown to be growing beyond the initial pavement and bridge assets to include many other assets, thus requiring even more coordination among stakeholders. It was noted that evaluations of consistency between TAMP planned and actual investment provided a key mechanism that encouraged coordination between planners and program managers.

Other Themes – Other recurring themes included the need for incorporating risk and resilience, climate change and equity into all levels of asset management; the need to ensure analysis and planned investments find a balance between typically rural secondary roadways and urban high-volume roadways; and incorporating the uncertainties of future project costs into longer-term scenario analyses.

Summary – In summary, the peer exchange sessions were highly beneficial in facilitating discussion through the many elements of asset management staffing and organizational structure, through

processes to ensure smooth transitions between planning stages, and technical tools to aid communication and data access, and accomplish the necessary predictive modeling and scenario analyses. Findings from this exchange will help FHWA and FTA identify the needs of transportation agencies, which may be addressed through training, research, and guidance.

Appendix

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 - Five County Association of Governments, Utah
 - Greensboro North Carolina Municipal Government, North Carolina
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 - Illinois Department of Transportation, Illinois
 - Indianapolis Metropolitan Planning Organization, Indianapolis
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 - Louisiana Department of Transportation, Louisiana
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 - Memphis Municipality, Tennessee
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