# 2023 Transportation Asset Management Peer Exchange

# The Art of Selecting Projects

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### 1 Overview

This report summarizes the proceedings of the 2023 Transportation Asset Management Peer Exchange hosted by the Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO). The peer exchange was held in Boston, Massachusetts on July 8-9, 2023.

#### 1.1 Peer Exchange Purpose

The 2023 FHWA/AASHTO Transportation Asset Management (TAM) peer exchange focused on the important topic of prioritizing projects and making the best selections. Good TAM includes the ability to make the best investment choices and deliver them effectively. Participants from State Departments of Transportation (DOTs) shared project prioritization practices and discussed lessons learned.

Participants engaged in a dialogue about how all of the elements of good project selection come together and prioritized what is most important to pursue for research and other advancement activities that will benefit the TAM community.

#### 1.2 Peer Exchange Format and Summary

The peer exchange consisted of four sessions with a panel for speaker presentations and time for questions, as well as various exercises and activities. The two-day event concluded with a discussion of key issues and future activities followed by a wrap-up summary.

To begin the event, Matt Haubrich (Iowa DOT) and Mshadoni Smith (FHWA) welcomed participants on behalf of the AASHTO TAM Subcommittee and FHWA, respectively. Next, Mike Johnson (Caltrans) discussed the purpose of the peer exchange and reviewed the agenda. Hyun-A Park of Spy Pond Partners (SPP) reviewed the logistics and related events of the peer exchange.

The first session of the peer exchange, Elements of Good Prioritization, discussed the importance of making informed priority choices that result in maximum performance improvements given the available resources. Presentations were given by Lina Chapman and Brad Sharlow (Michigan DOT), Shaker Rabban (Minnesota DOT), Justin Bruner (Pennsylvania DOT), and Jonathan Fok (Washington DOT). The session closed with a group discussion of the key elements that support good TAM.

The second session, Balancing and Aligning Needs, examined the process of prioritizing and balancing competing objectives and aligning across performance programs. A presentation was delivered by Mike Johnson followed by a small group exercise simulating the prioritization of a set of projects given a budget constraint and a discussion of how and why groups made their choices.

To wrap up the first day, Hyun-A Park asked participants to share what they learned by walking through the group exercise with different agencies, and she discussed the importance of learning from other agencies and implementing them back into their agency.

To begin the second day, Mike Johnson gave an overview of Day 1 and previewed the activities of Day 2. Hyun-A Park shared the results of the Scavenger Hunt from Day 1 and introduced the fishbowl exercise that took place in the third session.

The third session, Agency Practices and Challenges, was a fishbowl exercise that allowed intimate dialogue in a larger group with 3-4 people talking at a time. The speakers were seated in the front of the room, the fishbowl, while the rest of the participants sat and observed from their tables. Once a speaker was finished, they moved out of the fishbowl for another participant. This exercise was centered around the idea that a good TAM practice requires agencies to make the best choices in selecting projects that get funded and implemented.

The fourth and final session, How Can We Improve Practice?, developed practical applications of the ideas from previous sessions to improve TAM. Participants broke into small groups to come up with ideas for what can be done at a national level to improve practice. Each group presented their ideas followed by a large group discussion of how research and other implementation actions can advance practice. The session concluded with a prioritization of the ideas generated.

The peer exchange concluded with a discussion of key issues and future activities, and a summary by Mike Johnson.

#### 1.3 Peer Exchange Agenda

#### Day 1: Saturday, July 8, 2023

#### Introductions

1:00-1:30 PM Welcome, Opening Remarks, Participant Introductions

AASHTO (Matt Haubrich) FHWA (Mshadoni Smith) Agenda Review (Mike Johnson)

#### A. Elements of Good Prioritization (1:30-3:00 PM)

Making good priority choices that result in maximizing performance improvements for the resources available is key for good TAM. Many elements of good prioritization – goals and objectives, performance measures, leadership support, established business processes, collaborative culture, tools, good data, etc. – have to come together to enable making the best project selection choices. Presenters will share their thoughts and experiences related to what the elements are for good project prioritization followed by a group discussion of what the participants think are the key elements.

- Michigan Presentation (Lina Chapman and Brad Sharlow)
- Minnesota Presentation (Shaker Rabban)
- Pennsylvania Presentation (Justin Bruner)
- Washington State Presentation (Jonathan Fok)

#### 3:00-3:15 PM Break

#### B. Balancing and Aligning Needs (3:15-4:45 PM)

The art of good prioritization is the ability to balance competing objectives and align across performance programs. What are the relationships between asset conditions and other performance objectives such as safety, mobility, and air quality? How do equity objectives relate to TAM objectives? How do you prioritize when there are competing and sometimes conflicting needs? How do you align across an agency's entire performance management program? An introductory presentation will kick off this session followed by a small group breakout exercise. Each group will be asked to prioritize a set of projects with a constrained budget and explain how and why they made their choices.

- California Presentation (Mike Johnson)
- Small Group Exercise
- Group Reports

#### Day 1 Wrap Up

4:45-5:00 PM Summary of Day 1 Discussion, Ideas to Consider, Overview of Sunday's Agenda Note: A Saturday evening scavenger hunt and dinner will be planned for the group.

#### Day 2: Sunday, July 9, 2023

#### **Day 2 Introduction**

8:30-8:45 am Recap Saturday's Agenda and Overview of Sunday's Agenda

#### C. Agency Practices and Challenges – Fishbowl (8:45-10:00 AM)

Practicing good TAM requires transportation agencies to make the best choices in selecting projects that get funded and implemented. Participants will be invited to share their challenges, progress made, and ideas for improvements related to project prioritization using the fishbowl format.

Some agencies have innovations they would like to share that have been pre-recorded. They will provide a high-level summary of their innovations. All participants will share their challenges and successes as well as other ideas related to topics such as connecting their plans to programs, linking financial information across the life-cycle of a project from need identification to completion, using performance measures effectively to prioritize projects, decision-making processes, balancing transparency with need to adjust decisions, balancing competing objectives, and aligning across agency-wide performance programs.

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#### D. How can we Improve Practice? (10:15-11:45 AM)

The ultimate goal is for agencies to pull all of the elements together to have well-aligned prioritization and selection processes that agency stakeholders understand and follow. In the first part of this session, the elements from Saturday's first session will be used to break into small groups to develop ideas for what can be done at a national level to improve practice. Each group will present their ideas followed by a large group brainstorming on how research and other implementation actions can advance practice.

We will end this session with a prioritization of the ideas that have been generated.

#### Peer Exchange Wrap-Up (11:45-Noon)

Discussion of Key Issues and Future Activities, Summary of Peer Exchange.

#### 1.4 Peer Exchange Attendees

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# 2 Peer Exchange Introduction

#### 2.1 Welcome, Opening Remarks

Matt Haubrich of Iowa DOT (Chair of the AASHTO Subcommittee on Asset Management and Iowa DOT TAM Lead) welcomed participants on behalf of the AASHTO TAM Subcommittee. Mshadoni Smith (Performance and Asset Management Team Leader) welcomed participants on behalf of FHWA. She also thanked the states' DOT participants for their work to develop the transportation asset management plans (TAMPs) and support the annual process of certifying the plans.

#### 2.2 Overview, Objectives, and Introductions

Hyun-A Park of SPP reviewed the logistics of the peer exchange and related events. Mike Johnson of Caltrans (TAM Peer Exchange Chair and Caltrans TAM Lead) introduced the agenda and discussed the purposes of the peer exchange, which included:

- Advance the state of the TAM practice, including lessons learned
- Discuss the elements for good transportation asset management (TAM) based project prioritization and selection
- Gain knowledge of the available resources
- Share the experience of recent TAM advancements
- Including balancing multiple objectives such as equity and asset condition
- Discuss what TAM-based project prioritization will look like in the future
- Provide input on future TAM initiatives for FHWA, AASHTO, and Transportation Research Board (TRB)

One motivation for the peer exchange is the recent federal legislation that provided new funding and created new programs in areas such as equity and climate change. Transportation agencies face new challenges in trying to select projects considering these new fundings.

Mike asked for volunteers to discuss what their objectives are for the peer exchange.

- Omar Smadi of Iowa State University is working on a project for FHWA that involves working with various state DOTs. Information from state DOTs on their approach to prioritizing will be helpful to support this work.
- Chris Harris from Tennessee DOT has worked on estimating project costs and developing projects but has not gotten into the details on how projects are actually selected previously – interested in learning more about that.
- Drew Pavey, Alaska DOT&PF is interested in learning more from states on how they prioritize TAM projects.

Hyun-A asked participants for any initial insights they had on the topic of the peer exchange.

• Ken White of Rhode Island DOT (RIDOT) described that at RIDOT much of the focus has been on addressing poor bridges, and the agency has been successful in addressing

those. However, now it is harder to determine which projects come next. Now there are "a lot of immovable objects left on the board."

- Matt Haubrich described a recent incident at Iowa's transportation commission. Often petitioners come to the commission requesting that 2-lane roads are converted to 4 lanes. From the DOT's perspective, these projects are often hard to justify but often they have strong public support. When a petitioner requested such a project recently, a commissioner spoke up in response about the problems caused by trying to over-expand the system. It was clear the commissioner had been listening to the information provided by DOT staff, such as on the importance of maintaining existing infrastructure rather than investing more in expansion. It showed Matt that the types of ideas discussed in TAM peer exchanges are important, and in Iowa, the DOT is having some success in communicating with its transportation commission.
- Mike described his experience in Caltrans. Safety is always a high priority at Caltrans, but there are other priorities as well, such as improving the resilience of the transportation system to flooding and reducing dependence on internal combustion, single-occupancy vehicles to reduce congestion and reduce impacts of climate change. These are big issues in California, particularly given all of the recent flooding experienced in the state, and the fact that certain roads are now routinely flooded. All of these things are priorities, but everything can't be the highest priority, or nothing is really a priority, so there is a need to improve approaches for prioritization. Other agencies may have different challenges, but every agency contends with the concept of balancing multiple, competing priorities.

# 3 Elements of Good Prioritization

Making good priority choices that result in maximizing performance improvements for the resources available is key for good TAM. Many elements of good prioritization – goals and objectives, performance measures, leadership support, established business processes, collaborative culture, tools, good data, etc. – have to come together to enable making the best project selection choices. Presenters shared their thoughts and experiences related to what the elements are for good project prioritization followed by a group discussion of what the participants think are the key elements.

Link to presentations: https://www.tam-portal.com/collections/2023-tam-peer-exchange/

#### 3.1 Elements of Good Prioritization at MDOT

Lina Chapman and Brad Sharlow from Michigan DOT presented MDOT's approach. Lina described that for pavement, MDOT has set targets for pavement conditions since 1997. The basis for pavement condition is the Remaining Service Life (RSL) measure. MDOT updates its pavement condition file with data on RSL each year and uses the Road Quality Forecasting System (RQFS) to predict future conditions and set funding. Once funding is established, the Highway Call for Projects (CFP) Process is used to develop specific projects, which are intended to support meeting performance targets MDOT is required to develop by state legislation.



Next, Lina showed an example target allocation developed to support the CFP. This shows target allocation by region and type of work. From the perspective of the regional staff, there is always pressure to use the Rehabilitation and Reconstruction (R&R) program for non-pavement items. The program is intended to address pavement, but it is MDOT's largest program, so there is often pressure to add other components to pavement projects. Another challenge is contending with inflation, which erodes the buying power of MDOT's construction funds. An overriding challenge is obtaining funds needed to maintain the system, especially given that MDOT predicts conditions to decline given available funding. MDOT has three research and IT projects underway to improve MDOT's models and tools.

Brad presented on MDOT's State Long Range Transportation Plan (SLRTP). In order to support this long-range plan, MDOT has articulated an asset management vision and now has an initiative called MiTAM to bring asset management to all assets and develop an enterprise asset management system.



Brad summarized the work Michigan's Transportation Asset Management Council (TAMC) is performing to support the implementation of asset management at local agencies. MDOT is continually looking out how to bring these different efforts together to coordinate on how best to manage transportation assets.

#### 3.2 Project Prioritization and Selection (MnDOT)

Shaker Rabban of Minnesota DOT (MnDOT) presented on project prioritization and selection at MnDOT. One key document is Minnesota State Highway Investment Plan (MnSHIP), the agency's 20-year highway investment plan, which is fiscally constrained but not project-specific. The 10-year Capital Highway Investment Plan lists specific projects and is updated annually. He showed an example of the 20-year plan and described the different investment categories. The budgeted amounts are set in MnSHIP and used to help develop projects.



To prioritize projects, MnDOT has developed different lists of projects. The agency adopted a new policy in 2018 for prioritizing projects between these different lists (between categories). MnDOT calculates a score for each project and posts the scores for all projects, including those not selected. The score is one factor in project selection, but the agency considers other nonquantitative factors. The agency documents the rationale for using low-scoring projects or not choosing high-scoring projects. He described that districts have some discretion for scoping projects given their allocation - e.g., they can add additional assets to certain projects as needed.



In the 10-year plan, only pavement and bridge projects are scored. There are also standalone projects for other assets, but the majority of projects are pavement and bridge projects. Thus, the general approach is to add other assets to a planned pavement or bridge project, making it better defined, and other asset needs typically get added when a project is about 5 years out.

### 3.3 Project Selection Process (PennDOT)

Justin Bruner of Pennsylvania DOT (PennDOT) presented on PennDOT's project selection process, detailed in TalkPATransporation.com. A big emphasis of the current process is to encourage public involvement. The materials on the website address how projects are selected but do not describe "Step 0" in which the initial list of projects is developed. Using District 1 as an example, Justin explained that PennDOT has 11 engineering districts, each with one or more planning partners, who have funding allocated and develop a transportation improvement program (TIP). The planning partners and districts work together to identify projects and develop draft TIPs.



PennDOT recently reviewed the processes used by different planning partners and in different districts, and there is significant variation between them. However, all of the districts and planning partners work within the same procedural and funding guidance. These documents set overall funding levels and establish the "rules of the road" for developing PennDOT's 12-year program and the individual TIPs.

Justin described the relationship of PennDOT's TAM program to this process. Ideally, PennDOT's systems should help identify needs and recommend candidate projects. Some districts have been successful in doing this. District 8 is using PennDOT's Bridge Asset Management System (BAMS) to evaluate different funding levels. PennDOT is developing ProjectBuilder, a new system that recommends an initial capital program that incorporates proposed work candidates from its pavement and bridge asset management system (PAMS and BAMS), and it allows for specifying additional work candidates, bundles candidates into projects, and recommends an initial set of projects considering budget constraints. The system has been developed and is now in testing. One question is whether better results are actually obtained with these systems – that is the end goal.



#### 3.4 WSDOT Asset Management Program

Jonathan Fok of Washington State DOT (WSDOT) presented on WSDOT's asset management program and approach to prioritizing. WSDOT's executive order for asset management provides overall direction on the department's asset management process. The agency has 21 asset classes organized into 4 categories (inter-agency, multimodal, ferries, and highways). Jonathan listed some of the key data systems used to support asset management and summarized an internal asset management Geographic Information System (GIS) application the agency has developed that allows for showing asset needs together with needs for other types of investments, such as for safety, resiliency, and complete streets. Historically, much of the focus has been on pavement and bridges, and more work is needed to obtain data on other assets. Specifically, WSDOT is interested in adding more assets to the Asset Management GIS Application.



#### 3.5 Panel Discussion

Mike Johnson posed questions to the participants. He first asked whether there was anything people saw that they would like to take back to their agencies.

• William Johnson of Colorado DOT described that CDOT is at the point of beginning to develop a multi-objective prioritization approach. He is interested in discussing with MnDOT and other agencies how they group projects into a package.

Louis Feagans of Indiana DOT asked for more information on how MnDOT communicates scores and decisions back to stakeholders.

• Shaker Rabban responded that the focus is often on de-emphasizing the scoring. Often other issues determine when a given project is or isn't selected, and it is important to discuss those factors.

Mike asked whether there is a lot of second-guessing of the scoring process.

• Shaker responded that there isn't a lot of second-guessing; typically, stakeholders are appreciative of seeing the scoring data.

Another participant asked how frequently MnDOT will change its scoring.

• Shaker responded that the criteria will be updated every 4 years with each MnSHIP update.

Jack Moran of MassDOT described that MassDOT established an approach in 2014-2015, but that it was focused specifically on mobility and modernization projects. One issue is the timing of when projects are scored – information changes as the project is scoped. Also, he asked whether different scoring approaches are used in MnDOT for different types of projects.

• Shaker responded that some scores are specific to a program – different approaches for specific types of projects.

One participant asked whether projects get resubmitted from one year to the next.

• Shaker responded that in some categories this does routinely happen, such as for the noise wall program.

Omar Smadi asked about Michigan's targets for pavement conditions. Are these tied to specific types of work?

• Lina Chapman responded that Michigan does establish assumed funding for different types of work using a "mix of fixes" philosophy. Targets for types of work are communicated as part of the CFP Process.

Patrick Cowley of Utah DOT discussed that a theme of many of the presentations was the importance of communication – laying out the process clearly to all stakeholders. This is needed; if not, a prioritization process can become untenable.

Matt Haubrich described that Iowa DOT established a prioritization process, but it is applied at a corridor level before projects are scoped. This limits the value of the process. The timing question Jack raised is critical – may need to prioritize multiple times over a project's life cycle as more information is obtained on a project.

Mike closed the session by asking participants to think about how AASHTO and FHWA can help agencies make progress in the areas discussed during the session.

# 4 Balancing and Aligning Needs

The art of good prioritization is the ability to balance competing objectives and align across performance programs. What are the relationships between asset conditions and other performance objectives such as safety, mobility, and air quality? How are equity objectives related to TAM objectives? How do you prioritize when there are competing and sometimes conflicting needs? How do you align across an agency's entire performance management program? In a small group exercise, each group was asked to prioritize a set of projects with a constrained budget and explained how and why they made their choices.

#### 4.1 Exercise Results and Summary

The exercise involved prioritizing among a hypothetical set of eight projects, each with a budget and specific performance outcomes.

Project	Description	Cost	Performance Outcomes		
А	Safety Improvements to address run off the road crashes into fixed objects along a 50 mile stretch of highway.	\$45,000,000	Reduction of fatal injuries expected to be 1.2 per year		
В	Pavement rehabilitation projects on high volume roadway with poor condition pavement.	\$20,000,000	25 lane miles of poor pavement will be replaced		
С	Pavement rehabilitation on rural highway with poor condition pavement.	\$5,000,000	8 lanes miles of Poor pavement will be replaced		
D	A bridge replacement project involving a poor condition bridge in a disadvantaged community. The project will provide bike and pedestrian access that doesn't exist currently.	\$55,000,000	35,000 sq ft of new bridge with ped/bike access will be built		
Е	A highway raising project that will elevate a 2 mile stretch of roadway to avoid future inundation. The highway serves 55,000 vehicles per day and the closest available detour is 12 miles of additional travel.	\$10,000,000	Inundation and unplanned closure of approximately 4 days per year will be mitigated until 2075		
F	Rehabilitation of 5 bridge decks in a corridor. The bridges are all in poor condition with decks being the only identified deficiency.	\$45,000,000	A total of 100,000 sq ft are assumed to improve from Poor to Good condition		
G	Bike and pedestrian improvements including crosswalks and pedestrian signals for a corridor frequently used as an elementary school route.	\$15,000,000	Reduction in fatal injuries expected to be 0.5 per year		
Н	This project will construct operational improvements on a high volume 15 mile stretch of highway in an urban setting.	\$30,000,000	Project will reduce travel times by 5 min for 75,000 vehicles a day		

Each group was asked to select and rank the projects given a budget constraint of \$130 million. The results of the exercise are summarized in the table below, with rank 1 being highest priority:

ţ	1	2	e	4	5	9	7	8	ank	cted
Projec	Group	Avg. Ra	% Sele							
Α		2	3	1	1	1	1	1	1.4	88%
В	6							4	5	25%
C	5			1	5		5	5	4.2	63%
D			2		3		3		2.7	38%
E	3	4			4	3	4		3.6	63%
F	2	3		1		2		3	2.2	63%
G	1			1	2		2	2	1.6	63%
Н	4	1	1	1		4			2.2	63%

# Rank Scale: 1 2 3 4 5 6

Note that Group 4 ranked all selected projects as top priority.

Mike Johnson led a discussion of what projects were selected and what were not selected:

- **Project A (avg. rank 1.4)** most teams selected as a top priority given safety is identified as a priority. One group noted they did not select this project given another safety project was more cost effective. Mike pointed out that safety is identified as a top priority by many agencies, but that doesn't necessarily mean agencies fund all of their safety projects.
- **Project B (avg. rank 5)/C (avg. rank 4.2)** these two projects address pavement conditions. Maintaining conditions is identified as a target, though pavement targets are being met. Some groups selected given the priority of maintaining conditions. In some cases, Project C was either included or excluded based on the budget.
- **Project D (avg. rank 2.7)** this project was selected in some cases to make progress on bridge conditions and equity but ruled out in other cases based on the high cost. Only 3 teams selected this bridge/equity project but all ranked it in the top 3 of their selections.
- **Project E (avg. rank 3.6)** Where this was selected this was based on the desire to make progress towards resilience and reduce detours. Also, as in the case of C, this was either included or excluded in some cases based on budget.
- **Project F (avg. rank 2.2)** Most teams selected given the need to meet bridge targets. Some teams opted against it, however.

- **Project G (avg. rank 1.6)** Some teams included this project considering it addresses safety, a high priority. One did not, because the project would add more assets to the inventory, driving up future costs.
- **Project H (avg. rank 2.2)** All but 3 teams funded. One did not think other projects made progress toward congestion and noted the project could induce demand, leading to no net improvement in congestion.

Some of the goal areas had no specific targets and it appears these were valued based on the results. Some participants described giving those areas less weight. Only one team left money on the table, meaning that an overriding objective groups had was to maximize the use of available funds.

Mike asked how realistic the exercise was. A number of participants agreed the exercise was representative of what agencies must do.

- Emily Burns of Seattle DOT and Patrick Cowley of UDOT noted that in reality, one would have more information to substantiate project selection e.g., qualitative data about the communities affected or reactions of the public to specific roads.
- William Johnson discussed the "color of money" challenge not addressed here projects need to be matched to different funding programs/sources with different criteria and constraints.

# 5 Day 1 Wrap-Up

Hyun-A Park asked participants what they learned by walking through the exercise with different agencies.

• One participant noted that there were a lot of commonalities between groups in how they made decisions, even though different groups arrived at different conclusions.

Hyun-A discussed the importance of learning from different agencies and bringing that experience back to the participants' agencies.

# 6 Day 2 Introduction

Mike Johnson introduced the second day of the peer exchange by recapping the first day. He noted that the exercise of balancing across the small 8-project portfolio was eye-opening in contrasting the differing perspectives across an agency as well as the pressures of acting as an employee of a transportation agency. Communication is key, and these exercises can really expose that "selecting the right projects" can mean very different things to different people and many do not fully appreciate how different the "right" project can be to different stakeholders. It is a tough job to select the program of TAM projects, given limited budgets and the vast number of permutations. Participants agreed that similar exercises could be valuable as internal tools to raise awareness and help people navigate and connect with the programming process. Justin Bruner's animated graphic video explaining the programming process was noted as a helpful, fun way to explain the process to those looking to engage in the process.

Mike gave an overview of the Day 2 activities, Hyun-A Park shared the Scavenger Hunt Results and introduced the fishbowl exercise, highlighting the availability of the innovation videos on the portal.

# 7 Agency Practices and Challenges – Fishbowl

Practicing good TAM requires transportation agencies to make the best choices in selecting projects that get funded and implemented. Participants shared their challenges, progress made, and ideas for improvements related to project prioritization. The 'fishbowl' format was used to generate intimate dialogue in a larger group by having just 3-4 people talk at any one time. The speakers were seated in the front of the room while the rest of the participants sat at their tables and observed without interrupting. Once a speaker was done making his/her point, they moved out of the fishbowl and another participant became the speaker.

Some agencies had innovations they wanted to share that had been pre-recorded. They provided a high-level summary of their innovations. All participants shared their challenges and successes as well as other ideas related to topics such as connecting their plans to programs, linking financial information across the life-cycle of a project from need identification to completion, using performance measures effectively to prioritize projects, decision-making processes, balancing transparency with need to adjust decisions, balancing competing objectives, and aligning across agency-wide performance programs.

Link to pre-recorded videos: https://www.tam-portal.com/collections/2023-tam-peer-exchange/

#### 7.1 Innovation Elevator Pitches

- Drew Pavey, Alaska DOT new scoring criteria for projects, including authoritative data.
  - o Proactive keep good roads good
  - Reactive can't neglect poor roads
  - o General human priorities (e.g., of the maintenance group)

- Louis Feagans, Indiana DOT 20-year plans for each asset (pavement, bridge, culverts, MSE walls, traffic assets), addressing maintenance and capital program, and incorporating them using AI bundling techniques to create 5-year programs of projects for design. Also provide modeling to asset engineers to ensure projects selected are executed.
- **MnDOT** District lifecycle plans for pavement, bridges, and four other assets, compiling key risks, targets, and projections for a 10-year period to help create corridor risk tools for holistic approaches.
- North Dakota DOT Executive Draft STIP Meetings, used to better engage executives and explain various factors (including pseudo-political factors) and impacts of the TAMP and TAM programs.
- **Performance-Based Planning and Programming** Selecting projects through costbenefit analysis of newer projects, sharing various scoring methodologies and outcomes.

#### 7.2 Sharing Challenges, Progress Made, Ideas for Improvement

- **Patrick Cowley, UDOT** programming challenges around executive trust of data need the right measures and underlying data to build trust in the programming outcomes and shift from a "battle of assets" to a central, statewide TAM program. This requires data more than ever, so need to understand what data is useful and trusted to support the STIP meeting.
- **Doug Maki, MnDOT** successes convincing senior leadership, however, are struggling with downstream decision-makers. Need to convince them to shorten the capital project extent to include additional asset needs and the data isn't always trusted or embraced especially for really long-life assets such as retaining walls.
- Jamie Waller, TNDOT the biggest challenge is the implementation of a more TAMdriven program. Specifically, utilizing and trusting pavement data, given historical priorities and knowledge of the Districts. Hard to shift from worst-first to preservation through a data-driven approach. This is a big mind-state shift across fields and leadership. Focusing on that for the next few years.
- Andrew Williams, City of Columbus currently focusing on people, processes, and solutions and understanding what they don't know. Hard to communicate when you don't know, but it's worth communicating that you don't know. It can be a struggle implementing data-driven asset management systems, but it's about tough discussions. Currently implementing various MMS, AMS systems and also putting together Asset Mgmt. Lifecycle to focus on handoffs between various lifecycle stages in the asset life (plan, design, construct, operate/maintain).
- **Michigan DOT** trying to balance current preservation needs with the future needs for new mobility options, trying to balance asset management with long-range planning strategies within their current "call for projects" process. Developing crosswalks between asset management and planning investment strategies. Doing well with asset management-related strategies, but harder to bridge the gaps with mobility and equity strategies and asset management strategies. Trying to also bring more corridor-based planning before project selection.

- Alma Mujkanovic, Georgia DOT among the first state DOTs with a TAM plan and recall there was very little US asset management experience at that time. Now have pavement and bridge management systems, have confidence in those systems, and are in the process of data validation. But now they are trying to move beyond those two assets into the ancillary assets. Beginning by creating lifecycle practices for these assets as a basis for continued growth. Also learning how to better communicate TAM, providing services to internal SMEs to help with change management and knowledge transfer (especially in high turnover positions). Also working with automated processes for data collection (e.g. transition from manual inspection of pavement to automated approach).
- Ken White, RIDOT have existing and improving bridge and pavement systems, but struggling with secondary assets signals, sidewalks, guardrails, median barrier. Working on a pilot for data collection on ADA assets sidewalk and curb ramp. Trying to set up a shared contract to allow "crowd-sourced" sidewalk data collection. Interested to hear about others' successes in this area.
- David Schwartz, Kansas DOT sharing a mix of fix information with Kansas Road data, and exploring impacts on impacts of state of good repair. Shows how focusing on just one strategy can get you in trouble. Facing current challenges with expected turnover in key asset management positions and sharing knowledge with those who follow you. Also considering where TAM should live within the agency currently in planning and programming.
- Stephanie Shippee, CTDOT have 11 assets in TAM program, with SOGR placeholders in STIP, with asset stewards selecting projects for those pots of asset-specific funding. Working with stewards to educate and coordinate with stewards regarding the project selection process. For example, getting paving projects to incorporate ancillary asset replacement.
- Maryland DOT project selection is a competitive process between Districts, to convince executives to fund projects. Shifting to the presentation of the top five projects against Safety, Mobility, Access Needs, and top five projects for Asset SOGR (14 assets with district management of 7-8 of those assets). The funding office then looks at full lists across all Districts, to make the best funding decisions.
- William Johnson, Colorado DOT were the federal measures going to change the way projects are selected, Executives had thought they would not, but for the first time, they used the measures to select ~200M investment on the Interstate. Previous measures (drivability life) did not align with the federal measures and this is a significant shift.
- Jonathan Fok, WSDOT challenges of siloed systems, which are complex and don't talk with each other. Also struggle with similar data presented in each system but with different meanings. Currently in the process of replacement of these systems, which creates an opportunity to address these.
- **Caltrans** reflecting on the needs shared, all resonate with them. Made a lot of good progress on tools and methods to establish the program, now focusing on maturing data and models (e.g. condition projection, lifecycle, investment decisions). Have 30 different assets/objectives, there is a lot to juggle in their decisions, with a wide range of current maturity and sophistication, including big concepts, like climate what do they need to set aside and plan for in these areas?

- Charlie Purcell, Iowa DOT business case process, new project selection process intended to support capacity expansion project selection. Have a standard spreadsheet template and data to make the case for these projects, which are reviewed by a small group to test whether there is a compelling need with appropriate scope, to shorten project delivery time by focusing on top priorities and provide better customer service by avoiding frustrations around public engagement on projects which do not have a serious commitment to proceed with project execution.
- Laura Heckel, Illinois DOT challenges with decentralized org structure, asset management office (1 person) has to work with each District to try to implement TAM. They will ask Districts to use the AMS and have them see the value of TAM. Have included a TAMP breakout session within the annual district meeting, which had surprising interest and engagement, with Districts teaching other Districts what is working. Their approach is to leverage decentralization to create buy-in and expand the footprint of the small program.
- **TNDOT** have had fiscally conservative leadership, with fix it first mentality, however, this has created a challenge with historic growth and inflation making it hard. This is forcing tough decisions which have forced a prioritization approach that was not needed, with more competition between TAM and other programs (safety, capacity expansion). Also looking to incorporate other assets into their TAMP, beyond the required pavement and bridge starting a culvert condition data collection effort (19,000 inspected so far, with \$90M in critical needs) and will need an objective way to prioritize investments.
- Michael Weakley, Ohio DOT getting leadership onboard with data-driven TAM decisions. Data governance office includes the TAM office. Trust in data has led to a desire to expand data-driven investment to other assets OH signs, signals, towers, ADA. This has created changes between historical vs. data-driven funding distribution which are addressed through transparent communication.
- Scott Schoenmann, Wisconsin DOT internal acceptance, compliance, and training is the biggest challenge. Have executive buy-in with getting Regions on board. Have heard people say they are hamstrung by Asset Management, so need to make sure people understand TAM is about lowering the cost to achieve the lifecycle objectives. More training and tools should help get people to think about and embrace the system health tradeoffs over project-specific thinking.
- Maureen Kelley, Delaware DOT no county roadways, so maintain 90% of the state roadways. Borrowed CT factsheets to help expand TAM practice from pavement and bridge to other asset programs, helping those asset stewards better advocate and communicate their needs. Also focused on better utilizing capital programs for asset management, balancing short and long-term needs and spending, given it's a forecast.
- **Texas DOT** challenge of state vs. federal measures, currently run on state measures, but seeing federal measures are trending down despite good performance by state measures. Need to have better alignment of state approach with federal outcomes. Data is important, but the culture change is the real challenge made a switch between visual vs. automated collection with a lot of initial frustration due to differences. Opened up the audit to the practitioners to help build confidence and also asked them to show planned work and hold them accountable for plan implementation and outcomes this has exposed that the

Districts which collaborate are successful, while the Districts that don't are struggling. Also, the decentralized organizational structure has created challenges for long-term planning (e.g. 10+ years), need to work closely to get Districts thinking 10+ years in advance.

- New Mexico DOT culvert program has not historically been a data-driven program, with Districts avoiding CO involvement due to costs to the projects. Three years ago, received a grant to begin culvert inventory, trying to figure out TAM data needs to incorporate culverts into the TAM programming and planning processes. Trying to use technology to overcome the lack of resources, Districts are starting to see the value and are requesting CO support, which is creating a risk to CO resources needed to effectively utilize the data that is being collected. Focus is maturing from understanding basic inventory to understanding conditions to beginning TAM processes that save money and improve long-term outcomes.
- Meredith Hill, MDSHA executive culture of "money ball", understanding that balancing/optimizing how various colors of money are packaged together to achieve greater outcomes, incentivizing partnership by breaking down barriers in siloed project decisions by executives requiring partnership to advance project requests. Advice go into your agency and talk with the Federal Programs, who understand how to balance.
- Michigan DOT lean process improvements across the agency in all areas of business, trying to make things work better through their integrated program management program a Governor level initiative, led by HNTB with others working through them, bringing lots of historical knowledge to improving. Elevating awareness and motivation to improve processes and break down silos and change culture.

#### 7.3 Session Wrap-up

Matt Haubrich summarized trends from the DOT challenge report-out.

- 1. Challenge with Data trust, integrity, do I have what I need?
- **2.** Communication various forms, with public, executives, stakeholders? Kansas videos and the use of factsheets
- 3. Ancillary Assets e.g. culverts
- 4. Connecting Short- and Long-Term Plans
- 5. Changing the Culture get executive buy-in, navigating decentralized structure with Districts or Regions, how do we shift to data-driven TAM culture and decisions
- 6. Workforce and Training how do we do more workforce development and training to increase buy-in and improve outcomes?
- 7. Integration with non-TAM programs getting involved with all the colors of money and working with capital programs
- 8. Modeling tools and forecasting what can we do to improve modeling and understanding future needs?

# 8 Exercise – How Can We Improve Practice?

The focus in Day 1 was on individual agencies – but how can TAM practice be collectively shaped/advanced for all? There are mechanisms to fund federal research (e.g. AASHTO, TRB) – so what needs to happen at the national level to advance practice, what can be done to share and extend current practices? What research and actions should be funded and taken?

The ultimate goal was for agencies to pull all of the elements together to have well-aligned prioritization and selection processes that agency stakeholders understand and follow. In the first part of this session, the elements from Saturday's first session were used to break into eight small groups to develop ideas for what can be done at a national level to improve practice. Each group presented their ideas followed by a large group brainstorming on how research and other implementation actions can advance practice. The session ended with a prioritization of the ideas that had been generated.

Each participant had four votes to allocate to the best ideas. The ideas are listed below in order of priority:

- (15 Votes) Work Type Tracking & Forecasting
  - o Collect better data to develop better models
- (15 Votes) Need More Opportunities to Learn Cross-discipline
- (13 Votes) Leverage AASHTO to Develop Consistency
  - o B.P. for TAMPs
  - o Encourage FHWA to Adopt
- (12 Votes) FMIS & Track Different Colors of Money to better understand how money is being spent on TAM
- (12 Votes) Framework for Addressing Fed Grants in Long-Term Planning
- (11 Votes) Linking/Monetizing Maintenance vs Adding Assets
- (10 Votes) Inflation Factor Usage Modeling Inflation Contingency
- (10 Votes) Training/Capacity Building & National Coordination
  - Michigan TAM Champion
  - Create a basic toolbox
- (10 Votes) Data Collection on Ancillary Assets
- (9 Votes) Asset Treatments -> Projects
- (7 Votes) Framework for Handling Ancillary Assets
- (6 Votes) Framework for Breaking Down Silos in Agency
- (6 Votes) Data Mapping
- (5 Votes) Tradeoff Analysis Tools
- (5 Votes) Breaking Projects into Components

   TAM affect safety
- (5 Votes) Synthesis on Project Selection
- (5 Votes) Create Incentives for TAM implementation in Agency
- (5 Votes) Looking at Scope Creep in Projects
- (4 Votes) Data Fitness -> How to Determine

- (4 Votes) NHI Course/Training on TAM/TPM
- (3 Votes) Use Disruptive Tech for Data Collection
- (3 Votes) Need Clear, Succinct, and Concise Priorities
- (2 Votes) ID How to Measure Success in TAM Implementation
- (2 Votes) Project Coordination with Local Agencies
- (1 Vote) 2x Assets and Associated D.M.
  - o ID, Data, Guidance, Tracking
- (1 Vote) Project Selection Challenges between Districts and Central
- (1 Vote) Uniform Project Selection Criteria
- (1 Vote) Research Implementation Testers
- (1 Vote) Performance-based O&M Contracting
- (1 Vote) CBA National Level for Asset Units (e.g., \$/mile) and Guidance
- FHWA Regional Calls
- National TAM Vision for Funding
- What Assets can be a Guidepath to Failure

# 9 Summary of Peer Exchange

Hyun-A Park provided a brief summary of the common themes of the peer exchange:

- Lots of work towards making better, data-driven project selections
  - Having data and having good data are not the same thing
  - Several agencies talked about automating data collection, even in traditional pavement and bridge
  - Many agencies are broadening out into other ancillary assets
  - Revisiting legacy decision-making approaches and whether they are aligned with TAM motivation and context
- A lot of discussion about the communication of TAM e.g. the CTDOT factsheets, PennDOT animations to engage the public
  - Raising awareness with public and internal stakeholders
  - Making tradeoffs can result in winners and losers unique idea around publishing what didn't get selected
- Aligning Maintenance and Capital Work
- Advisory Groups coordinating all the groups and stakeholders forces much broader discussions e.g., disadvantaged community project or climate resiliency project and sitting them alongside the traditional asset management project how is that done?
- Project Selection is it driven by the desire to achieve performance? Seems to be the case for pavement and bridge, but maybe less so in other objectives. Are we just quantifying what projects we want to do, or are we really evaluating the objective to select the projects?
- Culture Change navigating mid-level buy-in, given there will be programs that lose out given historical investment levels.
- Modeling, Algorithms, Decision Software many agencies are working on this, with lots of references to MODA

Following the completion of the final session, Matt Haubrich, Mike Johnson, and Mshadoni Smith thanked participants for their engagement during the peer exchange. The hosts encouraged participants to take the energy for TAM and project prioritization back to their agencies and to continue learning from their peers.