TPM Peer Exchange: Using Performance Management to Respond to Uncertainty

Tuesday, September 23, 2025

Host State Introduction

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MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
Taking you places!
STATE HIGHWAY ADMINISTRATION

Introductions

Host State Welcome

Sutapa Samanta, P.E.

Chief Engineer

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STATE HIGHWAY ADMINISTRATION

CPBM Welcome

Christos Xenophontos

Chair, CPBM

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AASHTO Perspective on Uncertainty

Susan Howard

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AASHTO

Federal Perspective on Uncertainty

LaToya Johnson, P.E.

Transportation Asset Performance (TAP) Team Leader

Office of Stewardship, Oversight, & Management, Federal Highway Administration

U.S. Department of Transportation
Federal Highway Administration

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Purpose of Peer Exchange

- Share transportation performance management (TPM) practices and lessons amid uncertainty.
- Collaborate with State DOTs, FHWA, and agencies for knowledge exchange.
- Apply TPM strategies to adapt to unexpected changes.
- Foster a collaborative environment to improve outcomes.
- Support peer problem-solving and share successful TPM strategies.
- Prioritize TPM needs to enhance adaptability and optimize investments.

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Peer Exchange Objectives

1

Applying and advancing TPM practice to help agencies respond to uncertainty.

2

Fostering a collaborative environment to improve outcomes using performance management.

3

Engaging in peer-to-peer problem-solving, sharing noteworthy TPM practices, and exploring innovative solutions to enhance transportation agency adaptability in the face of uncertainty.

Today's Session Agenda

9:00 AM **Welcome & Introductions.**

- Host State Welcome & Opening Remarks. Sutapa Samanta & Laurie Goudy, Maryland DOT SHA.
- AASHTO CPBM Welcome. CPBM Chair Christos Xenophontos, Rhode Island DOT.
- AASHTO Perspective on Uncertainty. Susan Howard, AASHTO.
- FHWA Perspective on Uncertainty. LaToya Johnson, FHWA.
- Peer Exchange Overview & Objectives, Lori Richter, Spy Pond Partners, LLC.
- Icebreaker.

10:00 AM **A. Understanding & Responding to Uncertainty.**

- Educational Session.
- CPBM Subcommittee Panel Discussion.

Today's Session Agenda

11:00 AM **B. Navigating the Future: Key Trends Impacting Transportation Agencies.**

- Laurie Goudy, MDOT SHA.
- Keynote. Kristin White, Google.
- Q&A.

12:00 PM ***Lunch*.**

1:00 PM **C. Applying Performance Management to Address Uncertainty.**

- Breakout Exercise #1.
- Group Presentations.

2:05 PM ***Break*.**

2:20 PM **C. Applying Performance Management to Address Uncertainty (cont.)**

- Large Group Discussion.

Today's Session Agenda

2:50 PM **D. How to Effectively Communicate Uncertainty.**

- Mini Training Session.

3:20 PM **E. Communicating Uncertainty.**

- Breakout Exercise #2.
- Group Presentations.

4:15 PM **Peer Exchange Wrap Up.**

- Peer Exchange Summary, Wrap Up, and Next Steps. Anna McLaughlin, AASHTO.

Icebreaker

Time Allotment: 10 minutes

- Think about a time when you or your agency experienced an unexpected challenge or disruption.
- Discuss within your tables:
  - What was the specific challenge or disruption?
  - What made this situation unpredictable?
  - How did your agency respond to this uncertainty?
  - What was the most important takeaway or lesson learned from this experience regarding managing uncertainty?

Capture on Flipchart:

What one implementable idea will you take away from the peer exchange?

A. Understanding & Responding to Uncertainty

Session Objective

EDUCATION ON APPROACHES TO MANAGING UNCERTAINTY.

APPROACH FOR UNDERSTANDING UNCERTAINTY.

INTRODUCTION TO STRATEGIES THAT WILL BE USED IN AFTERNOON BREAKOUT EXERCISES.

Session Overview

- Types of uncertainty
- Decision-making approaches & agency strategies
- CPBM subcommittee panel discussion on current/new approaches, and related subcommittee/task force initiatives

What is Uncertainty?

Uncertainty:

- What it is: The existence of more than one possibility, where the "true" outcome, state, or result is not known.
- What it is not:
  - Ambiguity
  - Complexity
  - Error

Performance Management & Uncertainty

- Measurement as a tool: The act of measurement reduces uncertainty, which in turn helps us make better decisions.
- Impact of initial measurement: When you know very little, even small measurements greatly reduce uncertainty.
- Cost and value of measurement: By measuring something, you are paying for uncertainty reduction, and you can quantify the value of further measurement.
- Decision-making and risk: You only need further measurements if you're uncomfortable with the risk of a wrong decision.

(Adapted from Todd Shepherd)

Economic & Fiscal Uncertainty

- Declining fuel tax revenue
- Uncertain federal funding
- Limited state revenue options
- Inflation & supply chain issues

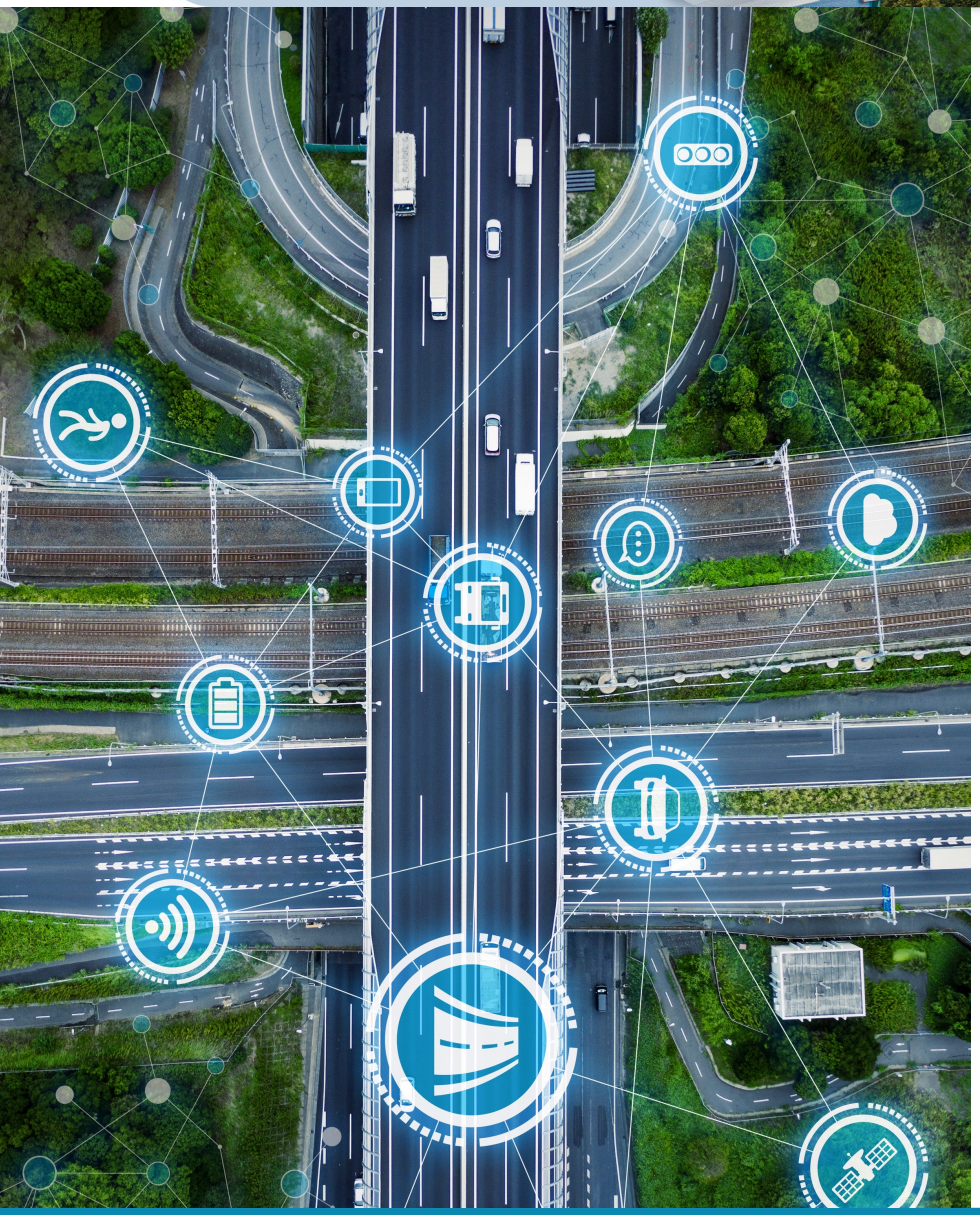
(California Legislative Analyst's Office, 2023)

Assessing California's Climate Policies—Implications for State Transportation Funding and Programs

Options to Address Approaching Transportation Funding Gap

Options	Key Trade-Offs to Consider
Increase Existing Fuel Taxes and Vehicle Fees	
Increase Existing Fuel Taxes	• Generally linked to road usage, but varies based on fuel efficiency. • Larger relative impact on lower-income households who tend to drive less fuel-efficient vehicles. • Relatively easy to implement. • Additional revenues raised would decline over time due to continued increases in fuel efficiency and ZEV adoption.
Increase Existing Vehicle Fees	• While not linked to road usage, does target vehicle owners—who likely use and benefit from the state's transportation system. • Larger relative impact on lower-income households, but could be mitigated to some extent based on how increases are implemented. • Additional revenues raised would not automatically track with fuel tax revenue declines and would require very significant increases to keep pace.
Shift Transportation Costs to Other Fund Sources	
Use General Fund or Existing Special Funds for Transportation	• Not linked to road usage. • Equity considerations would depend on the source of the funding. • Would need to weigh against other, non-transportation state expenditure priorities. • Would not be linked to rate of revenue declines from increases in fuel efficiency and ZEV adoption, meaning additional amounts would be needed over time.
Reduce Spending on Transportation Programs	
Reduce and Reprioritize Transportation Spending	• Would not require the state to increase taxes and fees or redirect funding from other sources. • Likely would have negative impacts on the condition and performance of the state's transportation system. • Some local governments could take local actions to offset losses in state funding, but likely not all.
Adopt New Transportation-Related Charges	
Implement Road Charge	• Directly linked to road usage. • Larger relative impact on lower-income households, but could offset existing disproportionate impacts related to average vehicle fuel efficiency across income groups. • Significant implementation and administrative costs. • Would address revenue declines from increases in fuel efficiency and ZEV adoption.
Implement New Taxes on Alternative Fuels	• Generally linked to road usage. • Larger relative impact on lower-income households, particularly if focused on public charging locations. • Poses unique implementation challenges, such as taxing the electricity used to charge vehicles at home. • Could address revenue declines from shift to ZEVs, but not declines from increases in fuel efficiency.

ZEV = Zero-emission vehicle.



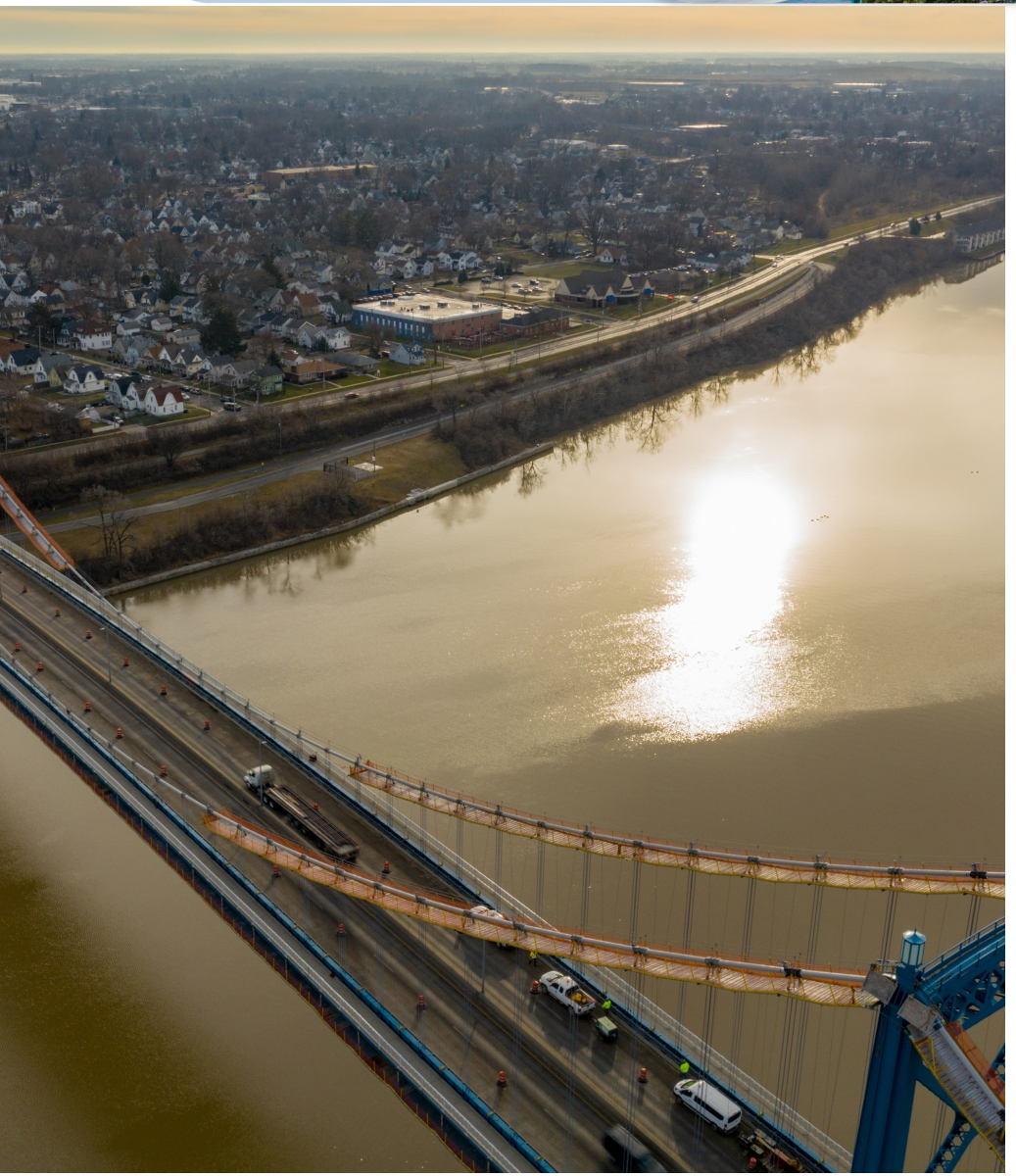
Technological Uncertainty

- New technologies
  - CAVs/EVs
  - Innovative construction
- Increasing demand on existing infrastructure
- Data management & security
- Uncertain speed of adoption

Socio-Political Uncertainty

- Changing federal and local policies and regulations
- Travel behavior changes and related needs
- Accountability & transparency
- Urban, suburban, & rural land use

(Empower Field, Denver, 2024)



Organizational Uncertainty

- Workforce demographics
- New capabilities
- Leadership
- Evolving workplace
- Partnerships

(Aerial drone bridge inspection, Anthony Wayne Bridge, Toledo, OH)

Environmental Uncertainty

- Climate change
- Extreme weather events
- Greenhouse gas emissions
- Pollution
- Land use

(Hurricane Debby)

Decision-Making Approaches & Agency Strategies

- Margin of safety
- Inversion/failure pre-mortem
- Pathways to success
- Strengthen ”change muscles”
- Embrace discomfort
- Focus on short- to mid-term goals, then prioritize the crisis and ignore the noise

Margin of Safety

- Description: Build resilience and preparedness through contingency planning/building a buffer.
- Example: Michigan DOT safety contingency fund

U.S. Department of Transportation
Federal Highway Administration

WORK ZONE MANAGEMENT PROGRAM

FACTSHEET

INNOVATIVE HIGHWAY PROJECT DELIVERY METHODS:
Safety Contingency Funding

Change orders are the traditional mechanism used to address unforeseen conditions that arise during construction. Unfortunately, when unexpected traffic safety concerns are identified during the project, the time and labor required for processing and approving a change order may impede efforts to address the safety issues quickly and efficiently. Establishing a safety contingency fund on a project can significantly reduce these impediments and improve safety much more quickly.

Examples of Safety Contingency Funding Initiatives

For the past several years, the Texas Department of Transportation (TxDOT) has been incorporating safety contingency funding into its projects.[1] More recently, the Michigan Department of Transportation (MDOT) pilot tested the establishment and use of safety contingency funds on a sample of projects.[2] The Washington State Department of Transportation (WSDOT) has also started including a new bid item labeled "work zone safety contingency" into its plans, specifications, and estimates (PS&E) packages.[3] Table 1 summarizes some of the key differences between the three initiatives.

Table 1. Comparison of the TxDOT, MDOT, and WSDOT Safety Contingency Funding Initiatives.

Parameter	TxDOT[1]	MDOT[2]	WSDOT[3]
What is the status of the initiative?	• The initiative is integrated into TxDOT workflows and processes.	• A pilot program effort was designed to encourage innovative thinking of ways to improve safety on a project.	• Integrated into WSDOT workflows and processes.
How is the initiative administered?	• A State force account item designated "Safety Allowance" is required for all construction contracts, unless reasons not to include are explicitly provided. • Funds do not need to be spent if they are not needed.	• Project engineers/managers prepare a special provision for safety contingency proposal form about the innovation to be deployed on the project.	• A new bid item "work zone safety contingency" is included on contracts and will be paid as a force account. • Funds do not need to be spent if not needed.
How is the amount of funding determined?	• TxDOT guidance is to provide 2–5 percent of the overall contract amount in the force account. • Districts determine the actual amount to include in the bid package for each project.	• The project engineer/ manager determines the needed funding amount to deploy the proposed innovation.	• Based on the Engineer's estimate of the total project:

Engineer's Project Estimate	Amount of Contingency Funding
< $5 million	$25,000
$5–$10 million	$50,000
>$10 million	$75,000

[1] See *Using Safety Contingency Funding to Address Unforeseen Safety Needs During Construction in Texas*, FHWA-HOP-20-009, for more information. Accessible at https://ops.fhwa.dot.gov/publications/fhwahop20009/index.htm.
[2] "Work Zone Safety Task Force" (WZSTF). MDOT. Accessible at https://workzonesafety-media.s3.amazonaws.com/workzonesafety/files/documents/SWZ/MichSafetyContFund.pdf.
[3] *Work Zone Safety Contingency*, Construction Bulletin #2022-04. WSDOT. November 2, 2022. Accessible at https://wsdot.wa.gov/sites/default/files/2022-11/ConstructionBulletin2022-04.pdf.

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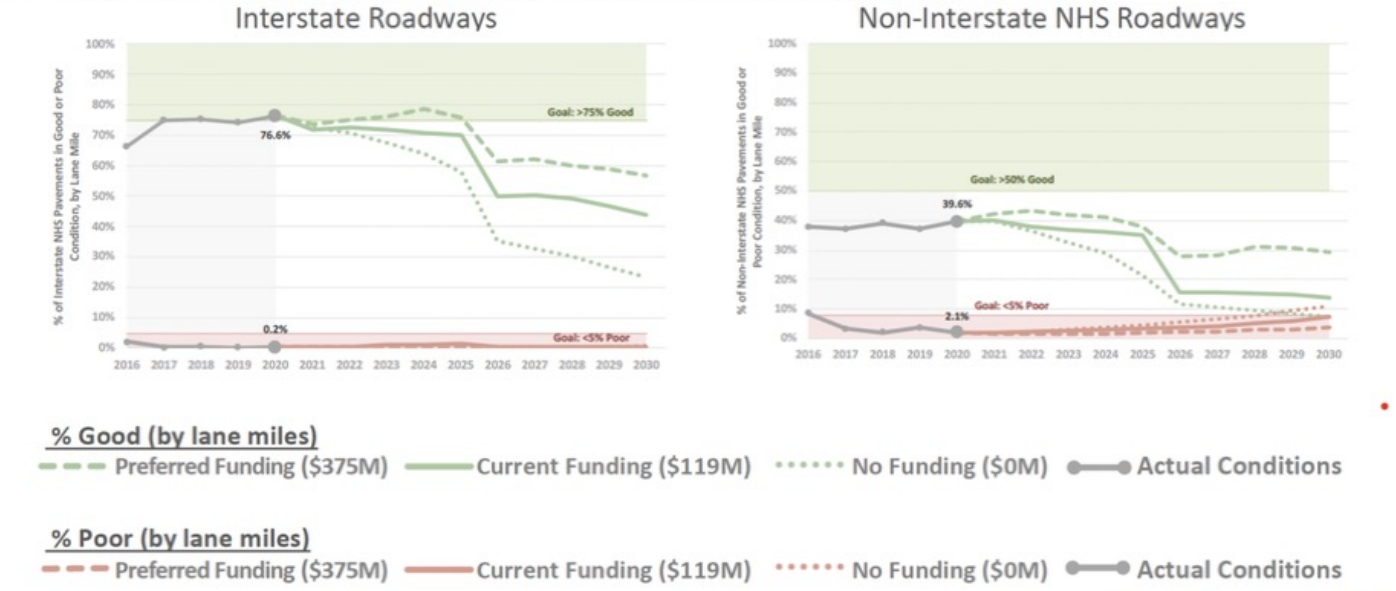
Inversion/Failure Pre-Mortem

NHS Pavement Performance Projections

Federal Requirements by lane miles for 4,868 lane miles of NHS pavement



Based on funding as of 12/31/21

Performance Projections at Current Funding Level ($119M Budget)

End of Year	2021	2022	2023	2024	2025	Goal
Interstate Good	71.8%	72.5%	72.0%	71.0%	70.0%	75.0%
Interstate Poor	0.2%	0.2%	1.0%	1.1%	1.3%	<5.0%
Non-Int NHS Good	40.2%	38.1%	37.0%	36.0%	35.0%	50.0%
Non-Int NHS Poor	2.0%	2.2%	2.7%	3.1%	3.5%	<8.0%

- Description: Look at things through opposite lens - what if worst case happens?
- Example: 2022 CTDOT TAMP

Source: https://www.tam-portal.com/wp-content/uploads/sites/12/2024/02/Connecticut_TAMP_2022_FHWA-certified.pdf

Pathways to Success

- Description: Develop a scientific mindset for decision-making and treat decisions as experiments for learning and adaptation.
- Example: Caltrans Monte Carlo Band

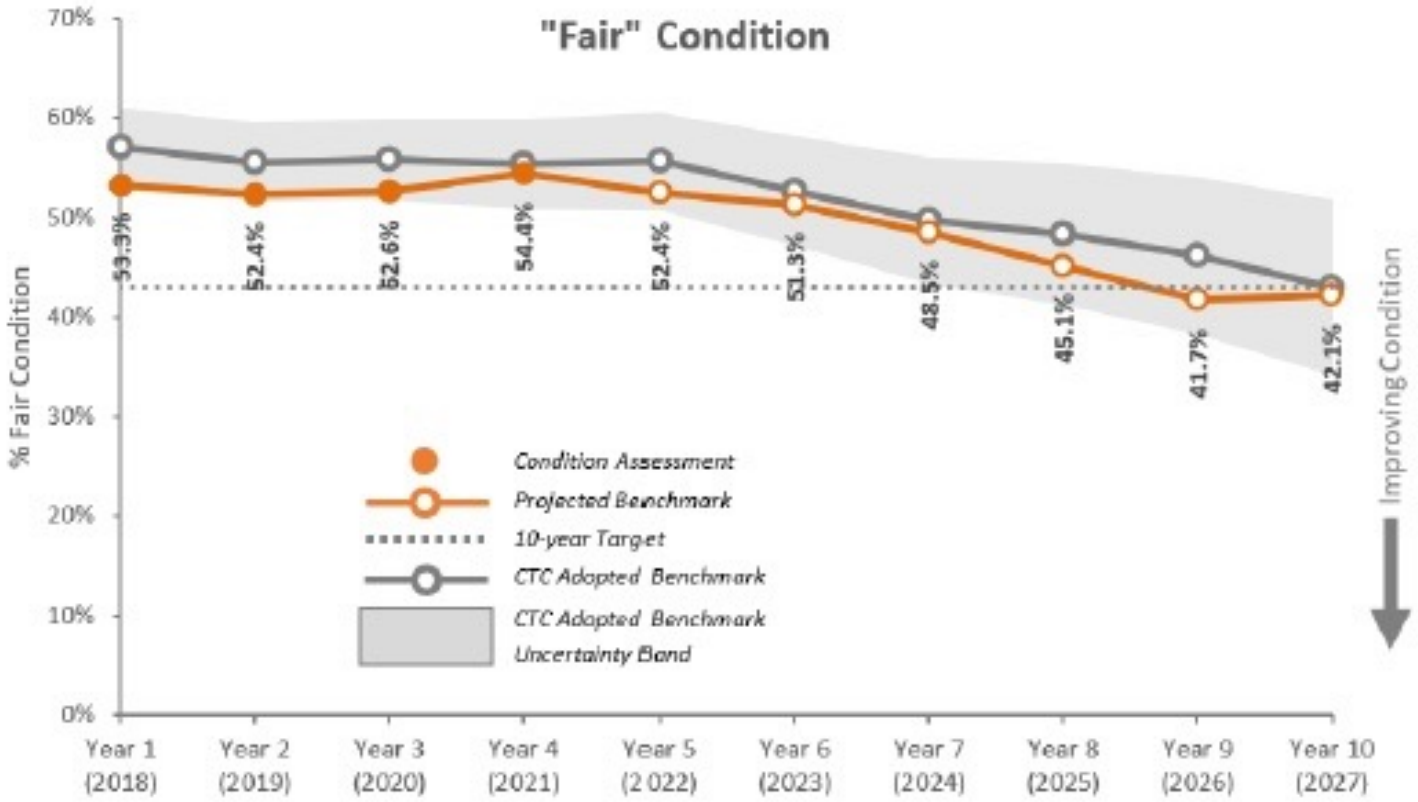
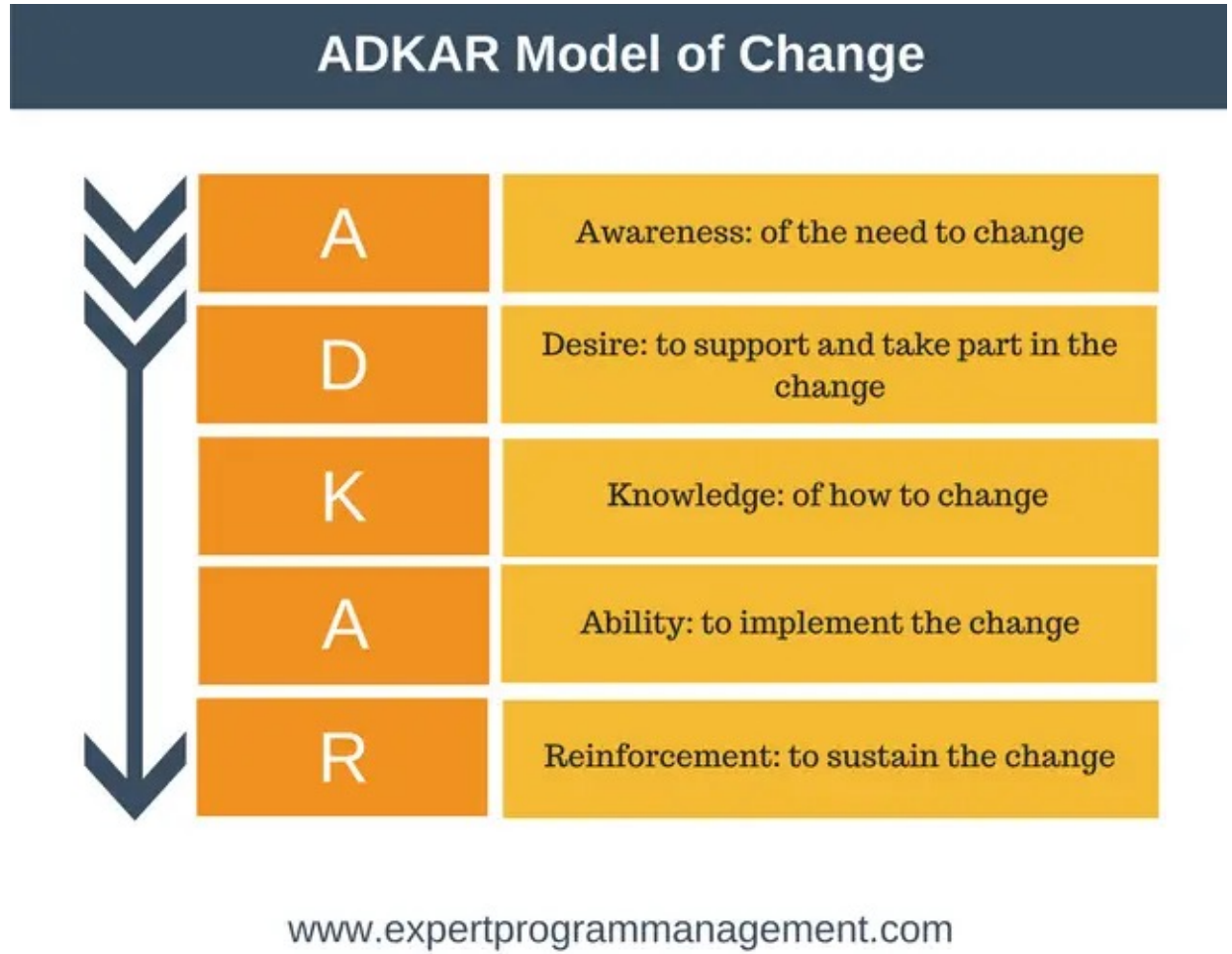


Figure 5 - Pavement Class II, Fair

Strengthen "Change Muscles"

- Description: Using change management to quickly adapt and be open to starting, stopping, and changing direction.
- Example: Colorado DOT Change Management



Strengthen "Change Muscles"

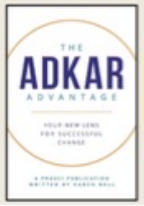
4 Core Roles in Change Management
(other than the people impacted by the change)

4

Employee-Facing Roles		Enabling Roles	

Sponsor	• Authorize the change
	• Fulfill three key roles: (ABCs)
	  • Actively and visibly participate throughout the project
	  • Build a coalition of sponsorship with peers and managers
	  • Communicate directly with employees
		Change Practitioner	• Apply structure and intent to change
			• Enable and equip other change roles
			• Collaborate on a unified approach with the project manager

People Manager	• Support direct reports in their change journeys
	• Fulfill five key roles: (CLARC)
	  • Communicator
	  • Liaison
	  • Advocate
	  • Resistance Manager
	  • Coach
		Project Manager	• Design, develop and deliver the technical solution with employee adoption and usage in mind from the beginning
			• Collaborate on a unified approach with the change practitioner



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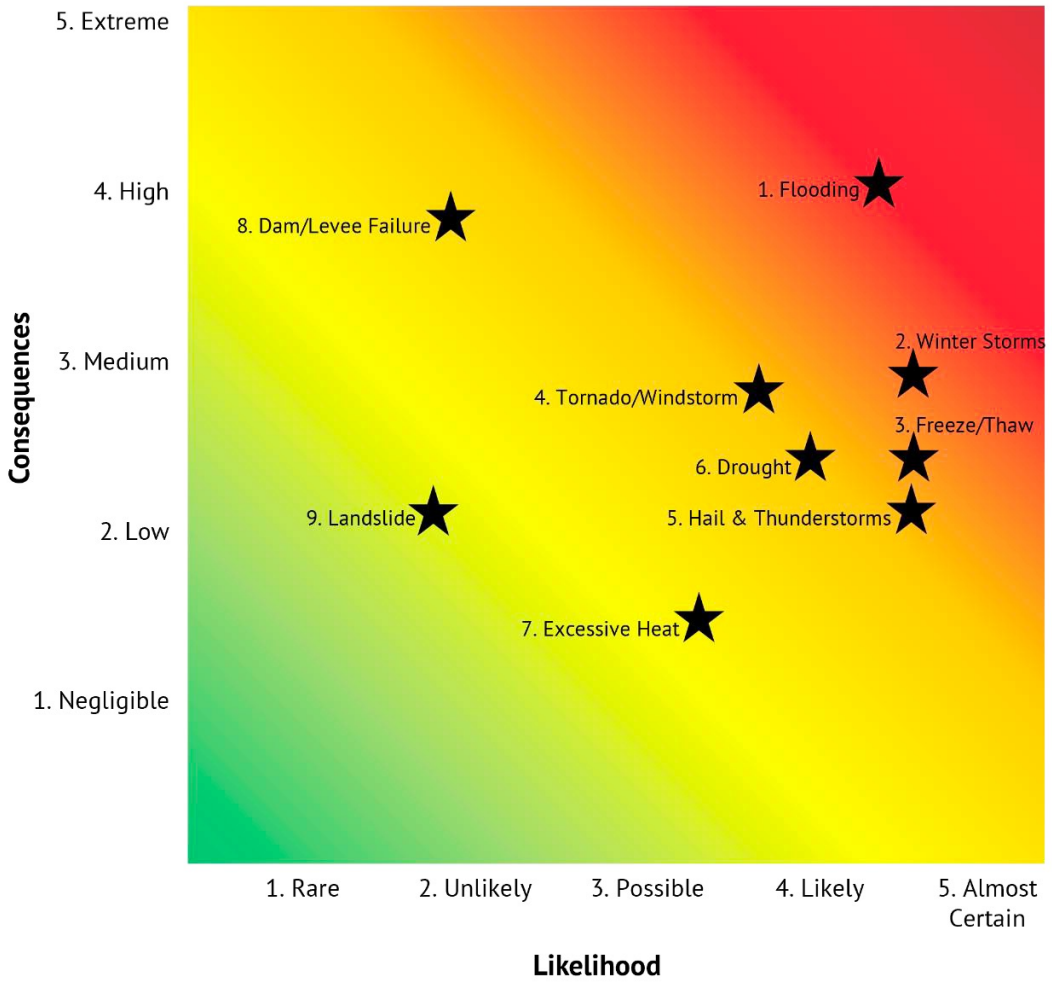
Embrace Discomfort

- Description: Being transparent about uncertainty to build trust.
- Example: Iowa DOT 2024 Resilience Improvement Plan

Source: https://iowadot.gov/media/2596/download?inline=



Embrace Discomfort

Reslience Related Risks and Responses

Risk Statement	Response Strategies
3. If appropriate protective features are not integrated into projects in locations vulnerable to extreme weather impacts, then assets may be less resilient and response and recovery efforts may be prolonged. *Likelihood: 3.9* *Consequence: 4.0*	**3A.** Adapt to and incorporate evolving protective measures utilizing findings of the Resiliency Working Group. **3B.** Incorporate climate change and extreme weather considerations into design manuals and processes.
4. If Iowa DOT takes advantage of increased discretionary funding programs, then additional funds could be available to implement asset management and resiliency investments. *Likelihood: 4.0* *Consequence: 3.5*	**4A.** As an agency be more strategic in pursuing discretionary grants. **4B.** Monitor local agency applications for discretionary grants. **4C.** Coordinate on what will be the priority applications in order to avoid competing internally for funds. **4D.** Undergo vetting process of options within and across the agency.
9. If flooding becomes more severe and/or frequent then additional labor, funding, and other resources will be diverted from TAM and other activities. *Likelihood: 3.4* *Consequence: 3.6*	**9A.** Improve documentation of flood incidents to maximize reimbursement opportunities for Federal ER funds. **9B.** Fund resiliency investments for critical infrastructure (e.g., U.S. 30 over the Skunk River).

Focusing on Short-Term Goals, then Prioritizing the Crisis & Ignore the Noise

AMAZING:

The Rebuilding of the MacArthur Maze

This half-hour Special tells the remarkable story of the fiery collapse and rebuilding (in only 26 days) of a key connector in the Bay Area's MacArthur Maze, where three major freeways meet just east of the San Francisco-Oakland Bay Bridge.

Amazing was produced and directed by David L. Brown, winner of two Emmy Awards for "The Bridge So Far," his recent documentary on the Bay Bridge. ***Amazing*** tells the story of the Maze reconstruction from the perspectives of all the main players in the drama: the now legendary contractor **C.C. Myers**; Caltrans Director **Will Kempton** and his Caltrans engineers; the Arizona steel fabricator whose company built the steel girders; the firefighter who responded to the accident; and the reporters who covered the story.

In addition to interviews, ***Amazing*** includes a wide variety of news and archival footage of the entire 26-day process beginning with the fire that melted and collapsed the structure and an animated depiction of the gasoline tanker truck which overturned and created the fireball. The film captures the vivid impressions of the first responders, the overnight creation of new design plans, and C.C. Myers capturing the winning bid, planning on a large bonus for early completion. Viewers will see how Caltrans and the Myers team tracked down enough steel and worked day and night to rebuild the structure in record time.

The Emmy Award-winning animation team from "The Bridge So Far" enhances the educational and entertainment aspects of the special: 3-D animation by Rick Pepper depicts the accident and rebuilding, and humorous cartoon animation by Charlie Canfield portrays key moments in the story.

Amazing is the first broadcast entertainment/documentary on this extraordinary story.

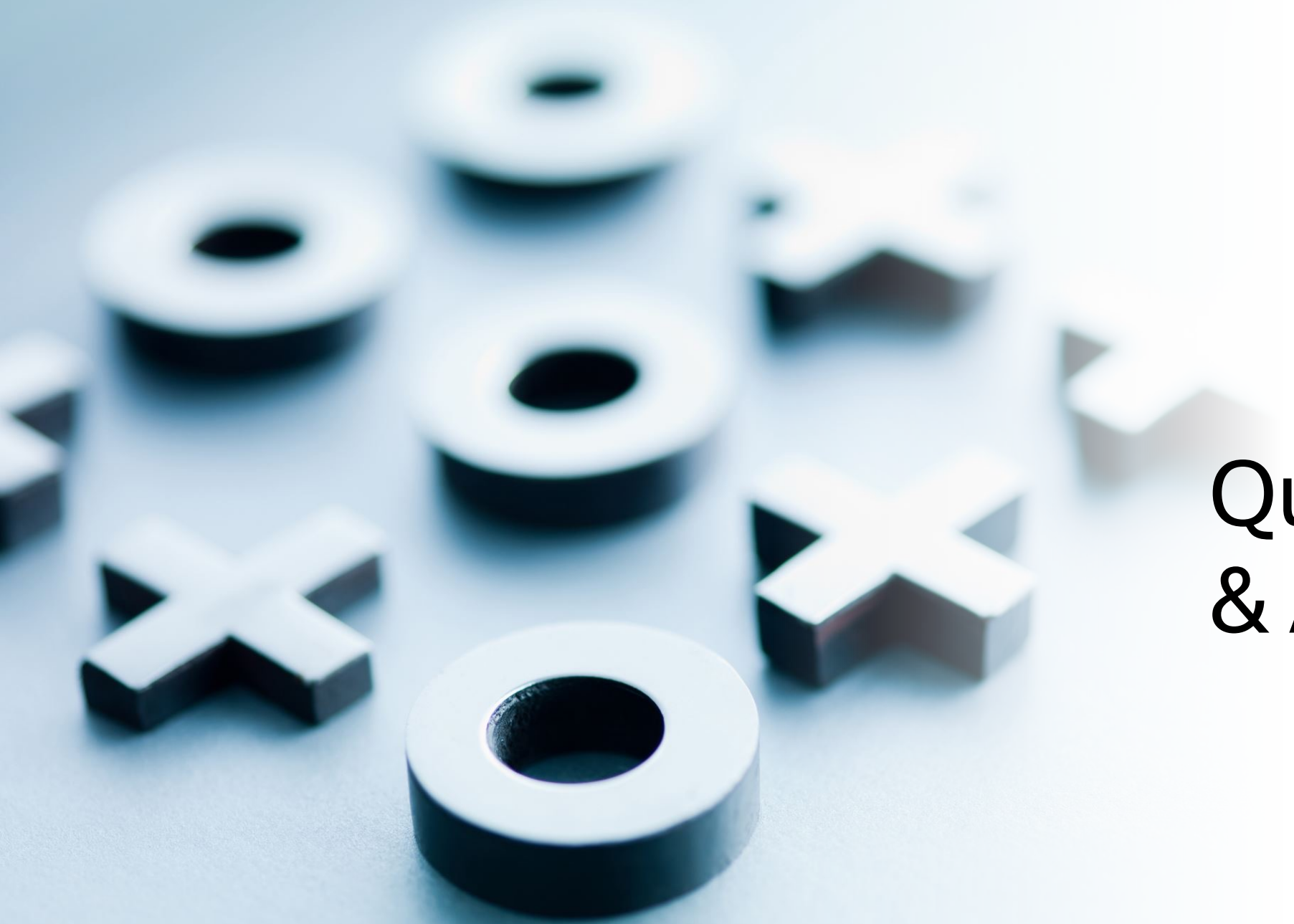
Visit the website at: www.amazingmaze.org Email us at amazing@amazingmaze.org

- Description: focus on the most pressing and critical issue at hand, while deliberately disregarding distracting information, concerns, or opinions.
- Example: "Amazing" story of interagency MacArthur Maze rebuilding

  https://pecg.org/communications/documentaries/amazing/

CPBM Subcommittee Panel Discussion

- Current approaches in performance management for addressing uncertainty
- New approaches & innovations
- Subcommittee initiatives & future needs



Questions & Answers

B. Navigating the Future: Key Trends Impacting Transportation Agencies

How Efficient Data Management Can be Paired with Performance Management

Laurie Goudy

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MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
Taking you places!
STATE HIGHWAY ADMINISTRATION

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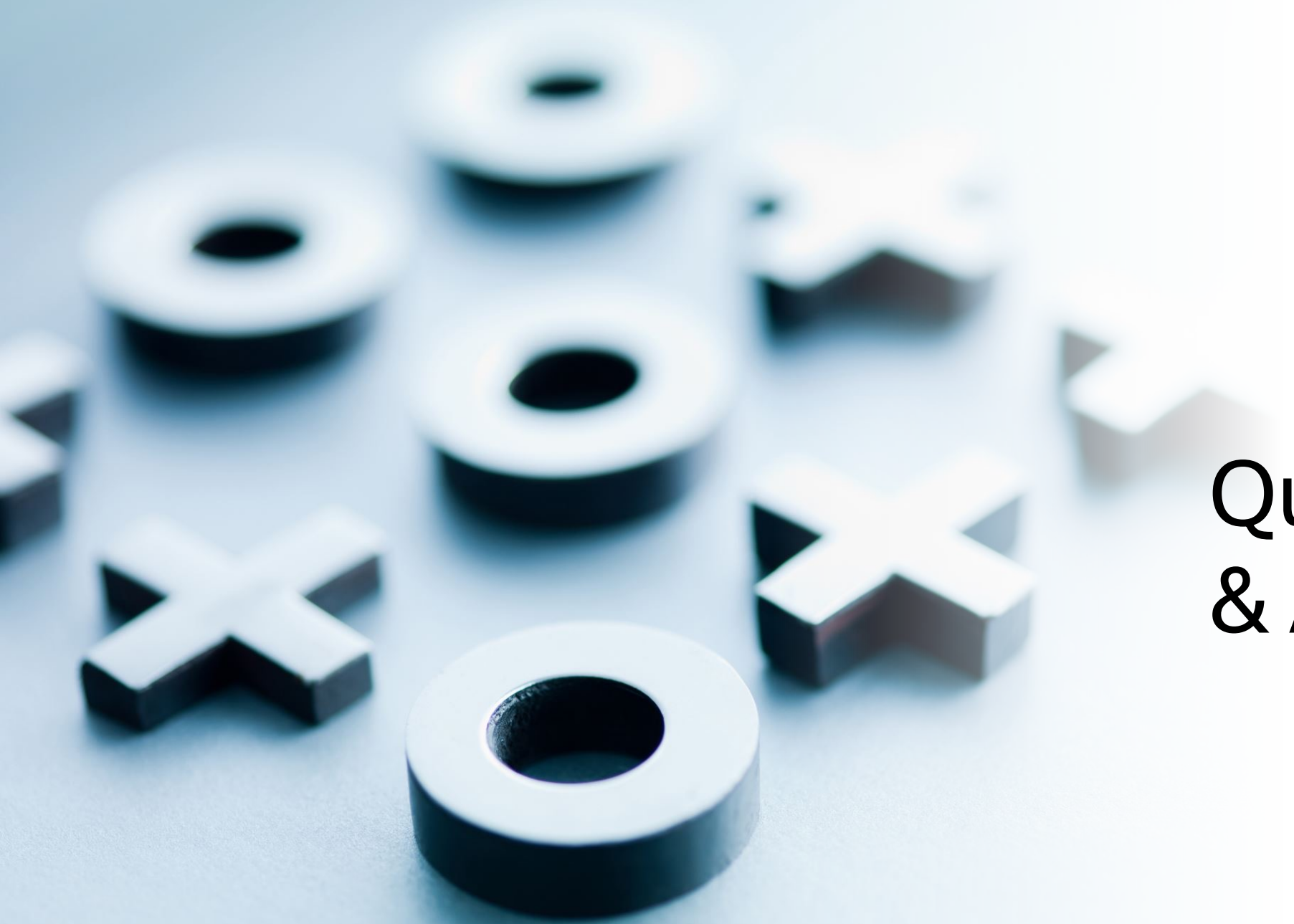


Questions & Answers

Lunch Break

C. Breakout Exercise #1: Applying Performance Management to Address Uncertainty

Session Objective

IDENTIFY KEY UNCERTAINTIES & IMPACTS.

APPLY PERFORMANCE MANAGEMENT STRATEGIES.

DETERMINE RELEVANT DATA & PERFORMANCE MEASURES.

SCOPE PROPOSED ACTIONS.

Instructions

Time Allotment: 45 minutes

- Designate spokesperson to present
- Read scenario; identify key uncertainties and transportation implications
- Select 1-2 strategies to address the key uncertainties
- Brainstorm actionable steps, focusing on performance management approaches, data, and processes
- Document using Google Sheet

Report Out

- Uncertainty scenario
- Key uncertainties and impacts
- Performance management strategies
- Relevant data and performance measures
- Proposed actions

Break

D. How to Effectively Communicate Uncertainty

Mini Training Session

Key Principles for Communicating Uncertainty

- Transparency about what you know, what you don't know, and what the process looks like *("If you're not giving… regular updates, they'll make up what they don't know to fill the information vacuum.")*
  - Current picture
  - Contributing factors
  - Realistic outlook
- Empathetic toward those impacted
- Clear, proactive messaging
- Follow generally good communication practices – simple, clear, and engaging

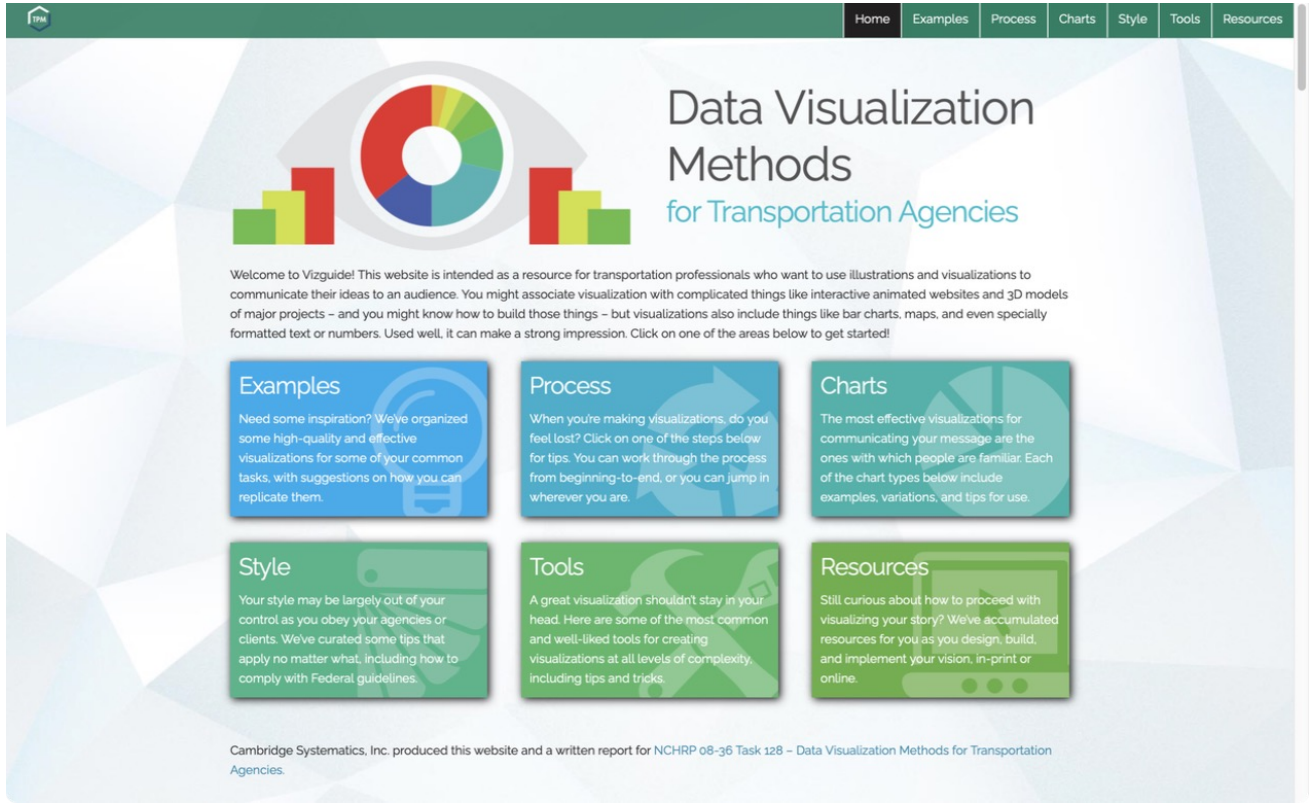
Communication Techniques

Start with what we know

Explain contributing factors and areas of uncertainty

Use compelling graphics to tell the story

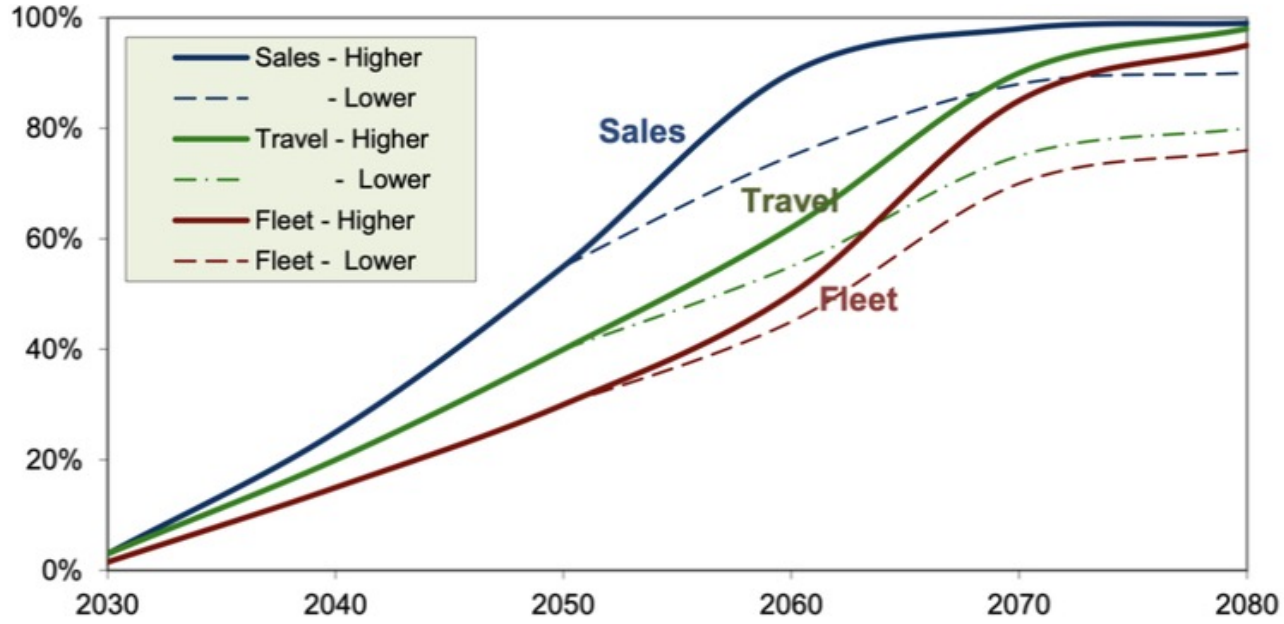
Communicating actions the agency is taking



https://vizguide.tpm-portal.com

Start With What We Know

- What this looks like:
  - Show historical and current performance data clearly
  - Talk about pace and trajectory of trends
- Example: "Autonomous Vehicle Implementation Predictions," Todd Litman. (VTPI, 2025)
  https://www.vtpi.org/avip.pdf



If autonomous vehicles follow previous vehicle technologies, it will take one to three decades for them to dominate new vehicle sales, and one or two more decades to dominate vehicle travel, and even at saturation a portion of vehicle travel may continue to be human operated, indicated by dashed lines.

Explain Contributing Factors & Areas of Uncertainty

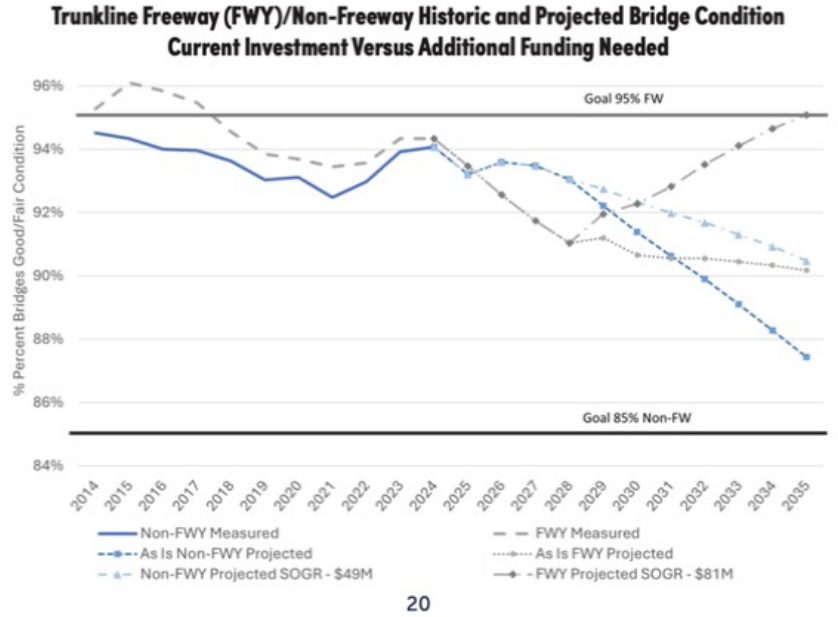
- What this looks like:
  - Explain which factors may impact performance
  - Why they are influential
- Agency example: Michigan DOT

Fast facts:

- MDOT Chief Bridge Engineer Rebecca Curtis testified in front of the House Appropriations Subcommittee on State and Local Transportation today, Aug. 13.
- While MDOT made record bridge investments during the height of Gov. Gretchen Whitmer's Rebuilding Michigan bond program, lack of sustainable funding means Michigan's bridge network and pavement conditions face a steep decline.
- MDOT's future budget projections allocate funding to replace fewer than 10 bridges per year of the 4,500 state-owned bridge network.

NBI Condition Ratings

Rating	Condition	Action
7-9	Good Condition	Routine maintenance candidate.
5-6	Fair Condition	Preventive maintenance and minor rehabilitation candidate.
4	Poor	Major rehabilitation or replacement candidate.
2-3	Serious or Critical	Emergency repair or high-priority major rehabilitation or replacement candidate. Unless clo monitored, it may be necessary to close until corrective action can be taken.
0-1	Imminent Failure/Failed	Major rehabilitation or replacement candidate. Bridge is closed to traffic.



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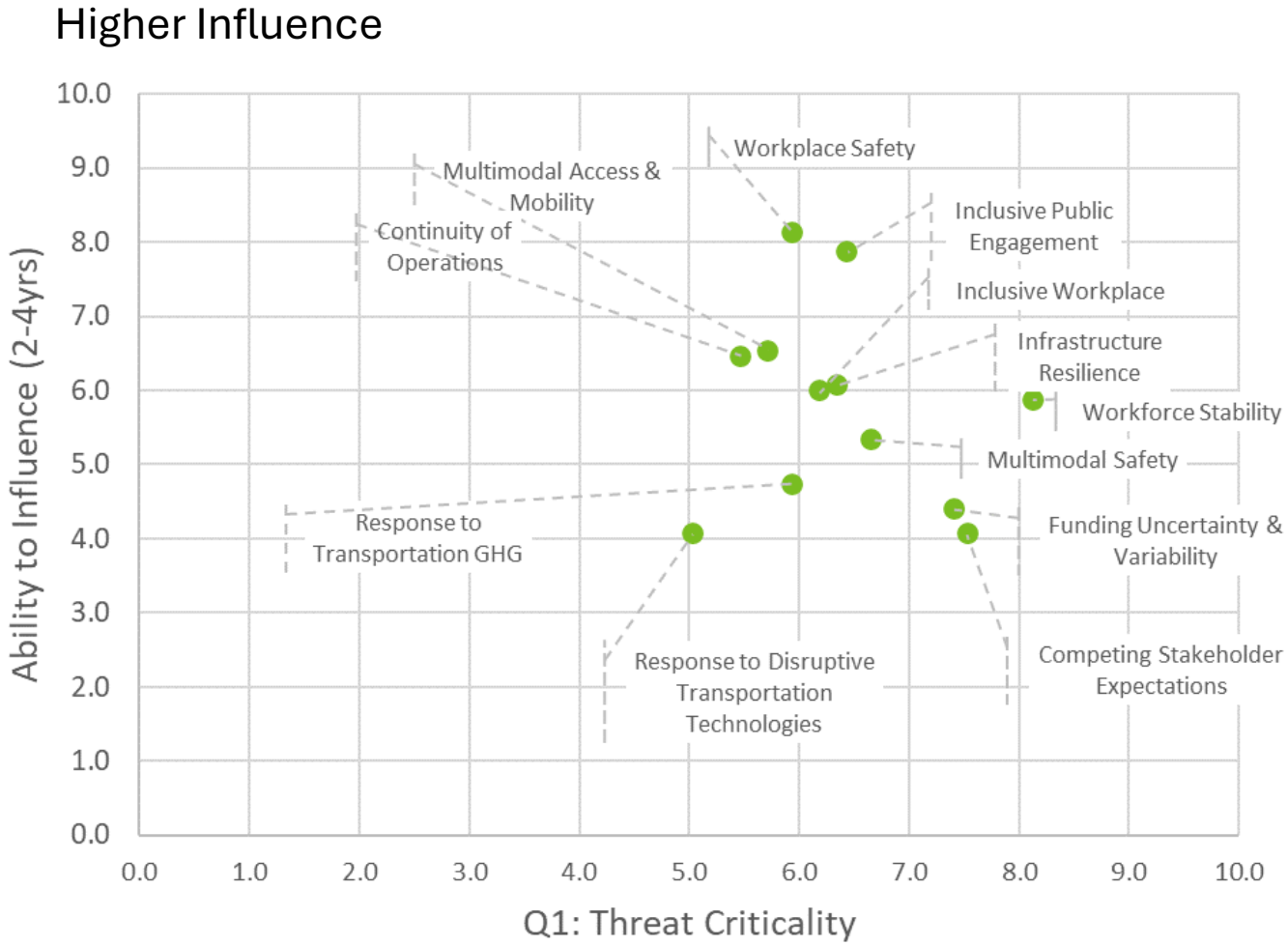
Use Compelling Graphics to Tell the Story

- What this looks like:
  - Clear labels showing various scenarios
  - Show ranges, error bars
  - Icons like most likely, worst case, etc.
- Agency example: Clean Energy and Climate Plan for 2050, Commonwealth of Massachusetts (2022)

https://www.mass.gov/doc/2050-clean-energy-and-climate-plan/download

Enterprise Risk Register Priorities: Threat and Influence



Risk Appetite

Impact Categories

As a leader who has to manage scarce resources and people, **what is your level of comfort with accepting these _____ risk impacts**?

Legal / Statutory / Policy	Reputation / Customer Trust	Financial (Capital, Operations, etc.)	Disruption of Services (Natural Disaster, Pandemic)	Workforce / Employee Safety / Organizational Capacity

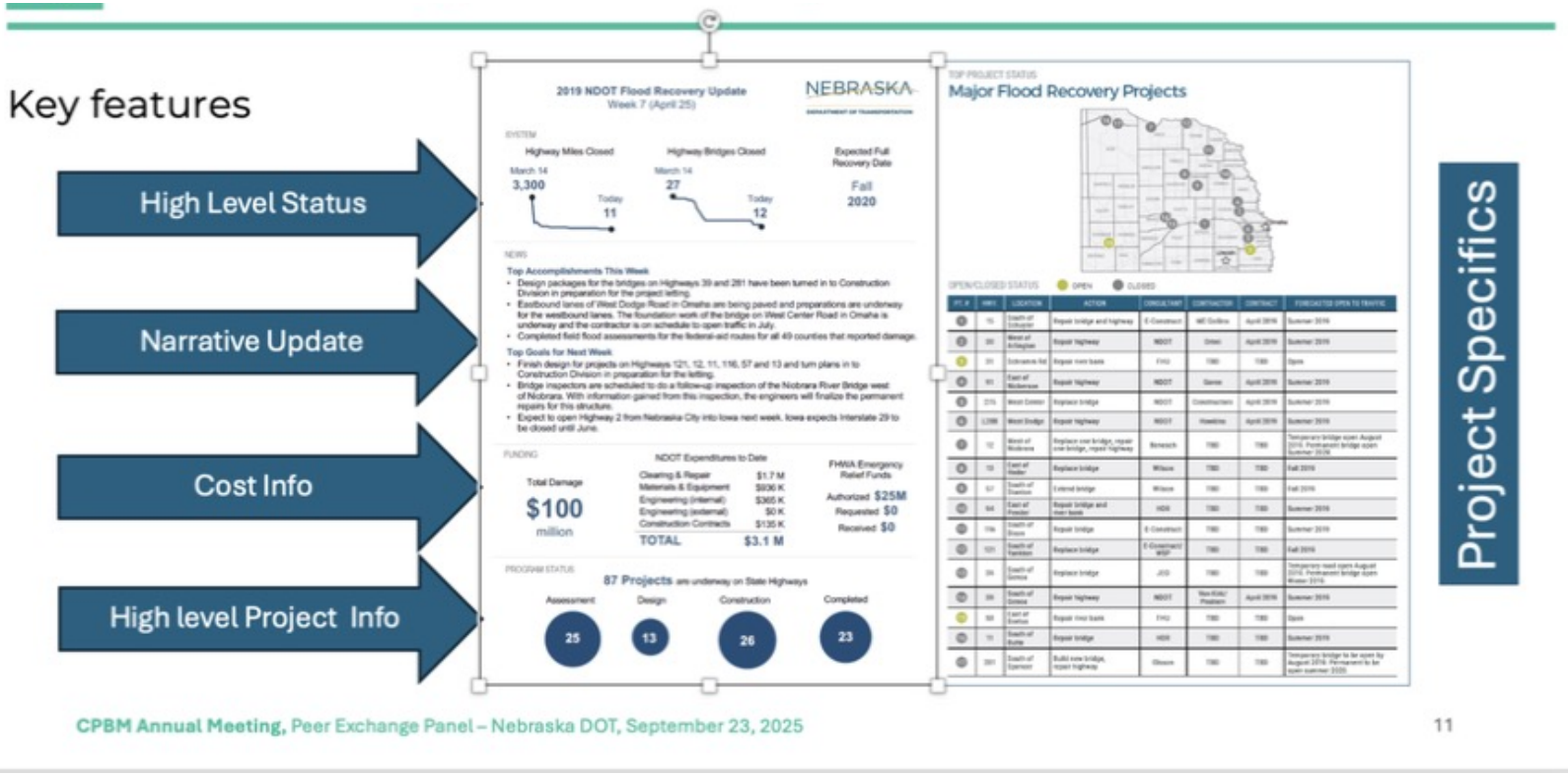
Comfortable: we need to manage scarce resources & people

Uncomfortable: The impact must be addressed, even if we have to move significant resources & people from another area

1	2	3	4	5	6
	Somewhat Comfortable	Slightly Comfortable	Slightly Uncomfortable	Somewhat Uncomfortable	

Communicating Actions the Agency is Taking

- What this looks like:
  - How agency is monitoring, analyzing, committed to addressing, etc.
- Agency example: Nebraska DOT



Discussion

- What are the challenges in effectively communicating uncertainty to stakeholders, leadership, or the public?
- How can we apply principles of clear communication to better convey performance information when outcomes are uncertain?
- How can performance management help in communicating the agency's adaptability and commitment to transportation outcomes?

E. Breakout Exercise #2: Communicating Uncertainty

Exercise Objective

DEVELOP COMMUNICATION MATERIALS TO CONVEY UNCERTAINTY IN PERFORMANCE REPORTING.

APPLY PRINCIPLES FROM PRIOR TRAINING ON COMMUNICATING UNCERTAINTY.

CREATE TALKING POINTS AND GRAPHICS TO ILLUSTRATE UNCERTAINTY.

Instructions

Time Allotment: 35 minutes

- Designate spokesperson to present
- Read scenario; identify performance measures and key uncertainties that need to be communicated to target audience
- Select 1-2 engaging communication channels, graphical elements, and a timeline for your communication
- Brainstorm 3-5 concise talking points that you will use to communicate
- Document using Google Sheet

Report Out

- Communication Challenge Scenario
- Performance Measures & Key Uncertainties
  - Measure
  - Specific uncertainties that need to be communicated
  - Audience
- Proposed Communication
  - Medium or media
  - Elements
  - Timing
  - Content (3-5 concise sentences)

Peer Exchange Wrap Up

Anna McLaughlin

Wrap-Up & Next Steps

- Thank you for your valuable participation!!
- Output from this session will inform future CPBM activities.
- Next Steps

Questions?