Committee on Performance Based Management

2025 Annual Business Meeting

September 25, 2025

Baltimore, Maryland


NAVIGATING TRANSPORTATION SOLUTIONS


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for addressing
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ee initiatives & future
Committee on Performance-Based Management transportation.org/cpbm
NAVIGATING TRANSPORTATION SOLUTIONS
PERFORMANCE MANAGEMENT
RISK MANAGEMENT
ASSET MANAGEMENT
PROJECT PLANNING
AASHTO


A–27 N–18
B–6 O–24
C–6 P–6
D–12 Q–3
E–36 R–18
F–6 S–12
G–9 T–18
H–6 U–12
I–27 V–6
J–3 W–6
K–3 X–3
L–12 Y–6
M–6 Z–3
BLANK–6
MERICSCRABBLE
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THEMES
- MEASURING/COMMUNICATING WHAT COUNTS
- ACTING BASED ON PERF. INFORMATION
- STRENGTHENING ORGANIZATIONAL CAPACITY
- SHARING EXPERIENCE / LEVERAGING RESEARCH
HIGH IMPACT
LOW FEASIBILITY
IMPACT
LOW IMPACT
Gehan
Justin
David


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PNC
PNC
JACKPOT TOTAL: $7,488
Visit WILLIAMSBURG
333

Agenda

1. Welcome and Kick-Off
2. AASHTO Updates
3. TRB Updates
   - AQB13 – Standing Committee on Asset, Performance, and Risk Management
4. NCHRP 23-32 Risk and Resilience Manual Update
5. Analysis and Assessment of the National Performance Management Data
6. CPBM 2025 Accomplishments and 2026 Action Plan
7. Research Road Map
8. 2026 and 2027 In-Person Meetings
9. Wrap-Up and Adjourn

Welcome and Kick-Off

CPBM Leadership

Christos Xenophontos, CPBM Chair

Assistant Director for Administrative Services – Rhode Island DOT

Jean Wallace, CPBM Vice-Chair

Deputy Commissioner and Chief Engineer – Minnesota DOT

Ryan Huff, CPBM Secretary

Chief Strategy Officer – Nebraska DOT

AASHTO Staff

Anna McLaughlin

Program Manager for Transportation Program Management

John Dean

Associate Program Manager for Performance and Planning

Abigail Butterick

Program Specialist for Performance and Data

AASHTO Updates – Anna McLaughlin

1. AASHTO Overview and Resources
2. Performance Management Technical Services Program Update
3. Reauthorization

Policy Bodies:

Transportation Policy Forum

Freight

Councils:

- Aviation
- Water
- Highways and Streets
- Rail
- Public Transportation
- Active Transportation

Board of Directors

- Executive Committee
- Strategic Management Committee

Special Committees:

- AASHTOWare
- Research and Innovation
- Associate Members

Program Delivery and Operations Committees:

- Planning
- Environment and Sustainability
- Design
- Bridges and Structures
- Traffic Engineering
- Right of Way and Utilities
- Materials and Pavements
- Construction
- Maintenance
- Transportation System Operations

Enterprise/Cross- Discipline Committees:

- Safety
- Communications
- Transportation System Security and Resilience
- Performance-Based Management
- Data Management and Analytics
- Funding and Finance

Administration Committees:

- Agency Administration
- Human Resources
- Internal and External Audit
- Knowledge Management
- Civil Rights

AASHTO re:source

https://transportation.org/services/technical-service-programs

Training and Professional Development

AASHTO Management Institute

AASHTO Leadership Institute

AASHTO Executive Institute

AASHTO Leadership Development Series

Presented by: KU The University of Kansas Public Management Center | CMC & Associates

AASHTO TECHNICAL TRAINING SOLUTIONS

Communications and Marketing

- Daily Transportation Update
- AASHTO Journal
- Transportation TV
- AASHTO Magazine
- AASHTO Newsletters
- Social Media
- Transportation History Blog

transportation.org/news

Performance Management Technical Services Program

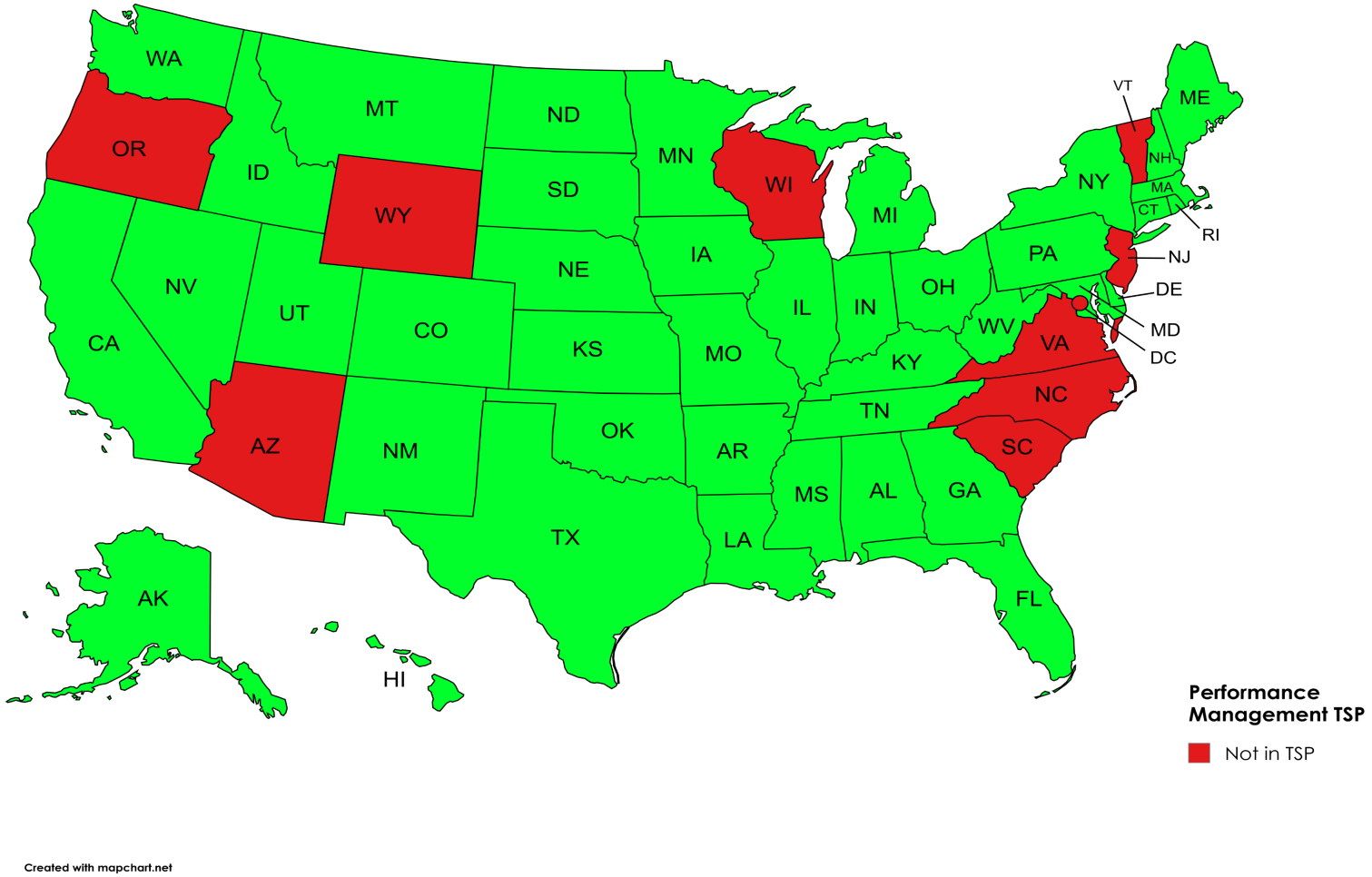
- Encompasses the many aspects of transportation performance management including asset management, risk management, and organizational management.
- Focus on supporting state DOTs with developing and delivering performance management training and education, facilitating the sharing and retention of performance management best practices, supporting AASHTO Performance Management tool development and access, and providing access to web-based technical services.

Performance Management TSP

The TSP includes the following areas for supporting member agencies:

- Develop and Deliver Learning and Capacity Development Resources
- Establish and Maintain the Transportation Management Web Portals
- Support Knowledge Transfer among state DOTs
- Provide Access to PM3 Web Tools

Performance Management TSP



FY23/24:

19 Original Pooled-Fund States

FY25:

41 Participating States

FY26:

42 Participating States

AASHTO/UMD CATT Lab Partnership

- There are presently 23 participating states taking advantage of the optional services available through the TSP:
  - Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Montana, Nevada, New Hampshire, New Mexico, Ohio, Oklahoma, South Dakota, Texas, Washington, and West Virginia

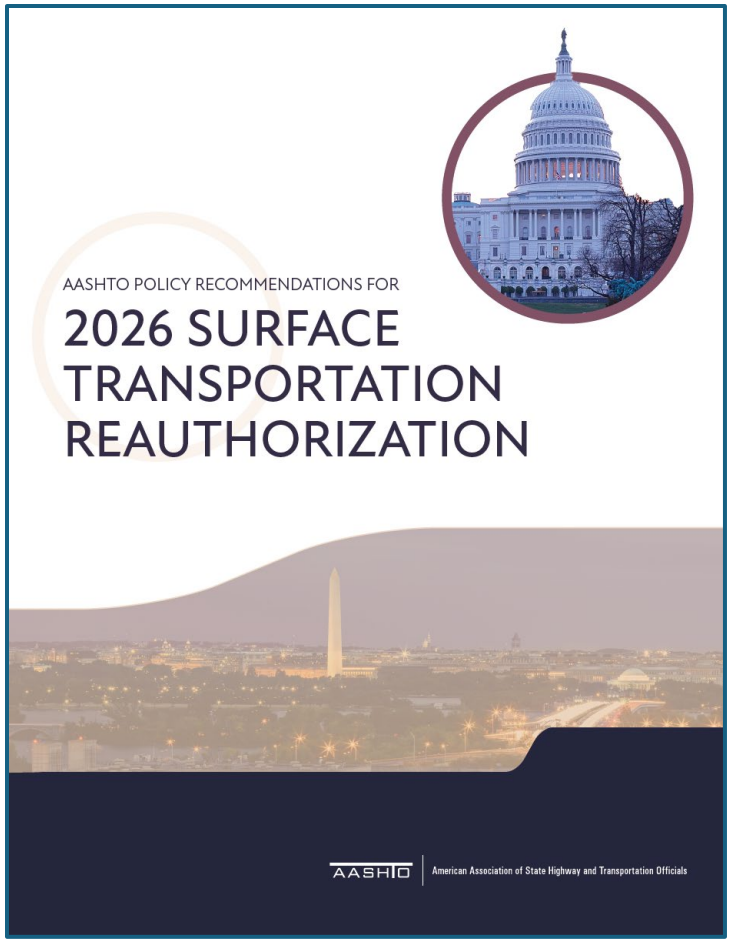
CATT LABORATORY

Surface Transportation Reauthorization

AASHTO's Vision for Surface Transportation Reauthorization calls for a world-class transportation system that supports and strengthens the nation's transportation infrastructure for a strong economy with improved safety and mobility.

Achieving this vision requires the following:

- Federal funding stability
- Formula-based federal funding paired with state contributions
- Current funding levels plus inflation must be the baseline
- User pay principles for all vehicles



Core Policy Principles for Surface Transportation Reauthorization

1. Prioritize formula-based federal funding to states.
2. Improve project delivery and program administration by increasing flexibility, simplifying environmental regulations, and reducing program burdens.
3. Create a more safe, resilient, and efficient future by supporting state DOTs' ability to harness innovation and technology.

TRB Update - AQB13 – Standing Committee on Asset, Performance, and Risk Management

- Meredith Hill, AQB13 Chair
- Shushanna Thompson, TRB

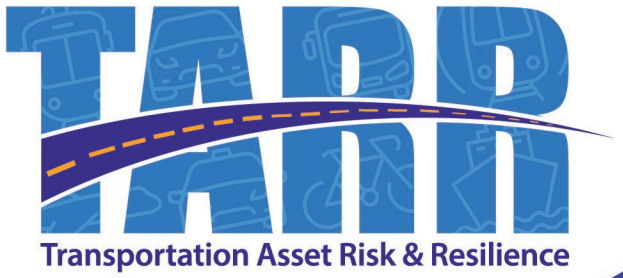
NCHRP 23-32 Risk and Resilience Manual Update

Aimee Flannery, Ph.D., PE

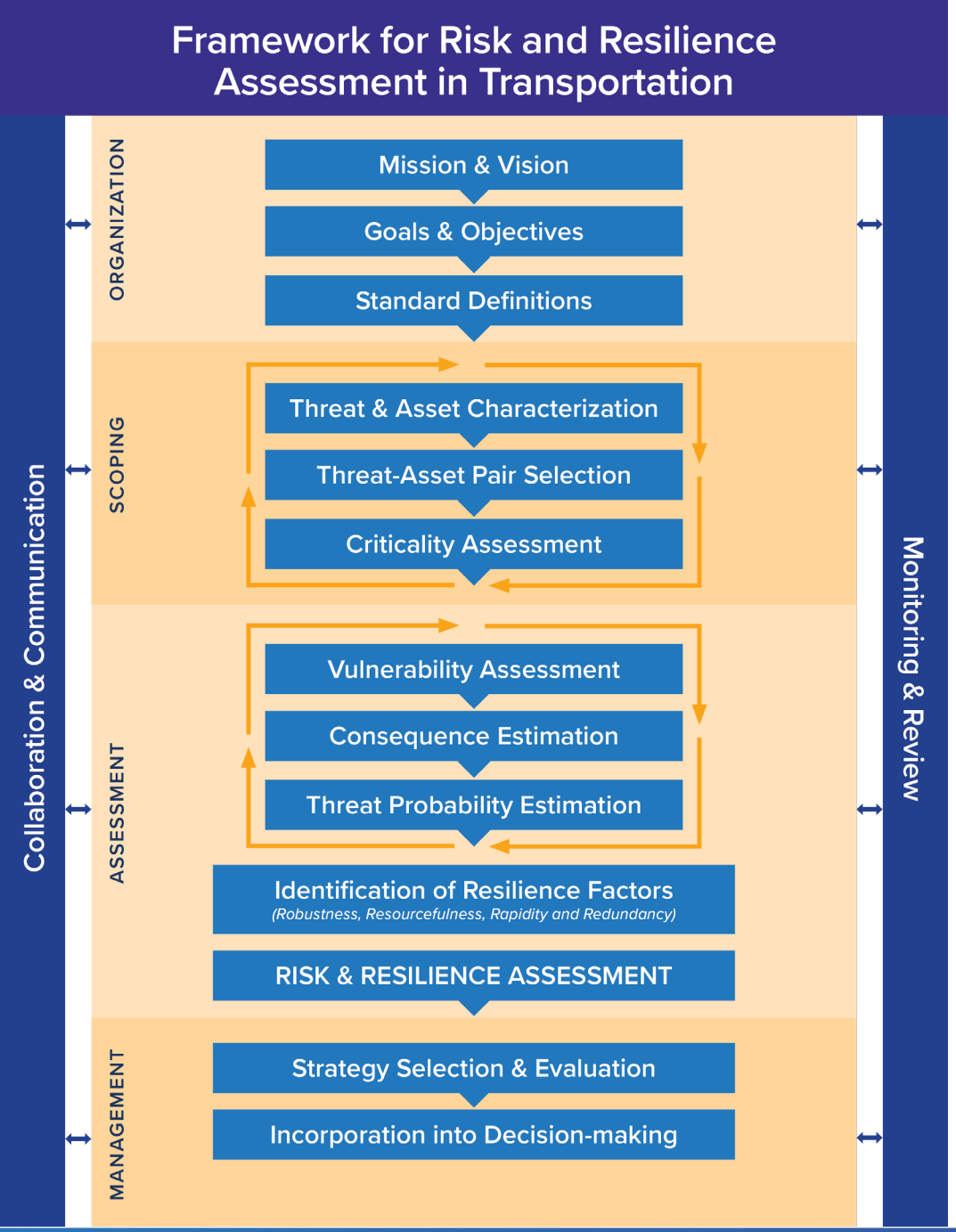
Global Principal Jacobs

Principal Investigator NCHRP 23-32

The National Cooperative Highway Research Program (NCHRP) *Project 23-32 Transportation Asset Risk and Resilience Manual*



Introduction/Overview



Project Scope

TARR
Transportation Asset Risk & Resilience

- Develop a *Transportation Asset Risk and Resilience Manual* based on NCHRP 23-09.
- Scope Manual to reflect agency resources
- Engage stakeholders for technical input and AASHTO publication support
- Develop quantitative risk & resilience models
  - Quantify financial impact to owner & travelers
- Demonstrate how other transportation modes could develop their own similar manual
- Identify future research needs

Threat-Asset Risk Models Included

Threat	Asset	Model Type
Flood	Bridge	Simulated behavior of bridge under stress Probabilistic modeling of anticipated performance based on engineering & physics (representative of ~97.5% of NBI bridges)
Storm Surge	Bridge	
Scour	Bridge	
Sea-Level Rise	Pavement	Mechanistic-empirical (ME) approach to modeling pavement behavior under stress.
Flood Inundation	Pavement	
Flood	NBI Culvert	Bayesian Models utilizing empirical data & engineering judgement.
Erosion	Roadway Embankment	
Rockfall	Roadway	
Marine Vessel Strike	Bridge	
Wind	Mast Arm	
Extreme Temp	Rail Track	
Extreme Temp	Airport Runway Ops	

Resilience Modeling Approaches Included

- **Manual will include input from NCHRP 23-26 and provide the user with approaches to estimate resilience.**

- **Resilience includes 4 Rs:**
  - **Robustness**
  - **Rapidity**
  - **Resourcefulness**
  - **Redundancy**

Two Methods to Measure Rapidity

Approach #1 (Data-Focused)

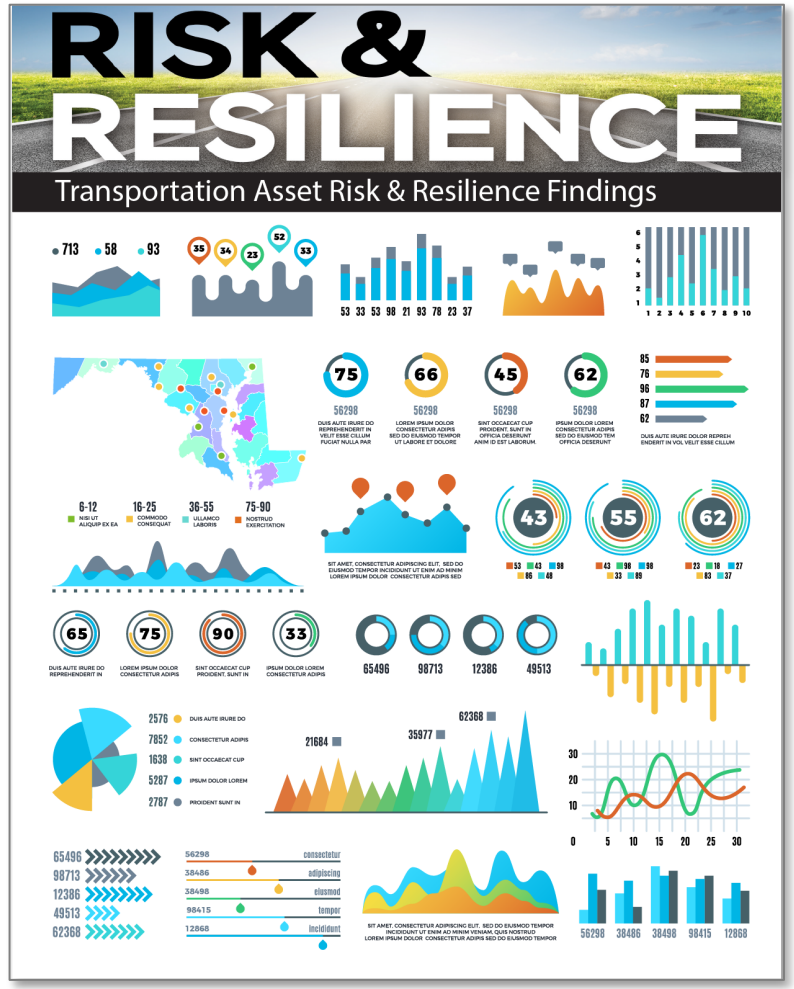
Probe Data Based Methodology

Approach #2 (Model and Defaults)

Leverages HCM-Based Methodology or Equivalent

Project Final Deliverables

1. Transportation Asset Risk & Resilience Manual
   - The **first-of-its kind** manual for surface transportation to be considered for adoption by AASHTO
2. Final report documenting research effort and key findings
3. Recommendations for future research, including research problem statements
4. Stand-alone memorandum that identifies implementation needs and pathways



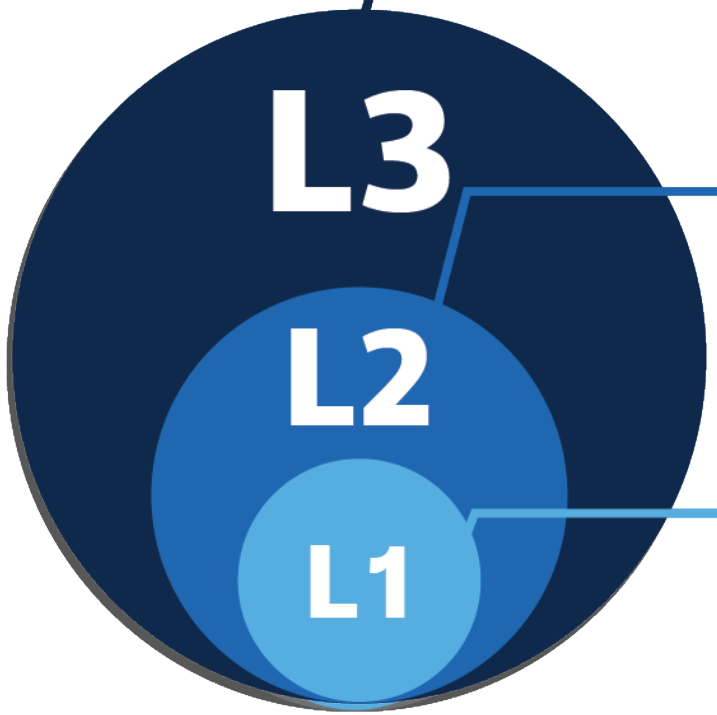
Model Development

Risk & Resilience

Data Throughout Planning & Project Development Phases

- Asset-specific and threat-location-specific data improves throughout the planning and project development process
- Risk & Resilience Models or Methods needed to support **planning**, **preliminary engineering**, **detailed design or assessment of existing assets**.
  - Models need to reflect available information or data at the time of analysis

Modeling Levels



LEVEL 3

Risk exposure methods most applicable when limited asset-specific or location-specific threat data is known. Initial screening models for narrowing the universe of assets that require more detailed analysis to understand annual risk. Reliance on existing threat mapping and asset location mapping. May include a consideration of asset criticality within overall system operations to identify for further assessment.

(Planning – Screening)

LEVEL 2

Models that are most applicable when information is available about the setting of the asset including watershed characteristics, NBI data, global design characteristics, etc. Risk assessment is conducted with semi-probabilistic methods.

(Preliminary Design)

LEVEL 1

Models that include asset-specific and threat-specific information. Threat-Asset pairs that can be modeled in a fully quantitative manner (deterministic or probabilistic). Level 1 would assess the specific conditions of a given pavement asset or bridge asset under various threats using location-specific threat data (probabilistic or deterministic; stationary or non-stationary).

(Detailed Design or Assessment of Existing Assets with known design parameters and in-situ threat data available)

Erosion-Road Embankment

Model Overview

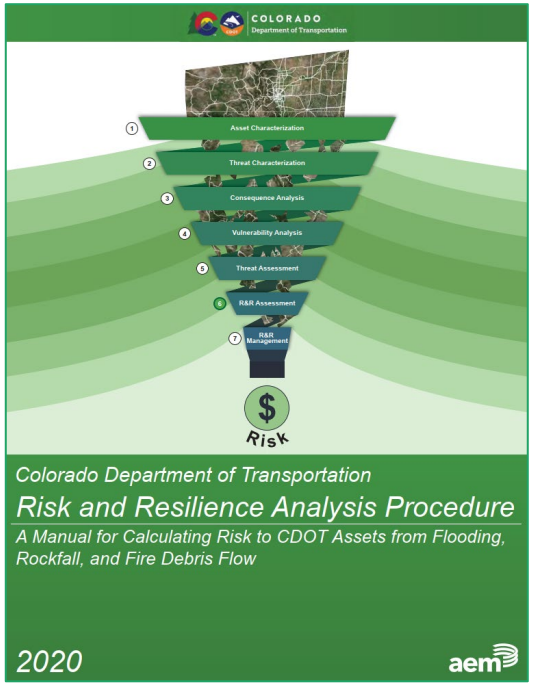
Model Steps	Data Sources	Methodologies	Resources needed	Output
Step 1 : Asset Data Collection	HPMS database Agency's asset management databases As built Plans**		*Agency's HPMS or roadway geospatial data*	**Asset Data**
Step 2 : Threat Data Collection	National hydrology and hydraulics tool-sets** Agency's H&H tool-sets Detailed H&H Assessments Expert Knowledge		National Elevation Dataset National Hydrography Dataset SME - H&H	**Threat Probability & Magnitude (T)**
Step 3 : Consequence Assessment	Estimated Unit Costs for Impacted Roadway** Agency's Maintenance Records Expert Knowledge		SME - Pavement / Roadway Planning for Pricing	**Consequences (C)**
Step 4 : Vulnerability Assessment	**4.1 Stream Power Assessment** Percent Max Stream Power **4.2 : Stream Proximity Assessment** Range banding statistics		SME - GIS Analyst SME - H&H	**Vulnerability (V)**
Step 5 : Risk Assessment	**Risk = C * V * T**			**Risk in $ value**

*** Data sources and Methodology used*

Example Level 3 Vulnerability Assessment

Colorado Department of Transportation Tool

CDOT developed vulnerability scores (from 0–1) to estimate highways to assess the vulnerability of roadways (highways) based on flood magnitude, terrain, and potential embankment erodibility. These values were developed based on research, stakeholder input, and engineering judgment and represent the probability the overtopped roadway segment experiences failure or the Worst Reasonable Consequence (CDOT 2020).



Flood Event Magnitude	Terrain	Embankment Erodibility Potential				
		Very Low	Low	Moderate	High	Very High
100-yr	Level	0.22	0.23	0.25	0.31	0.33
	Rolling	0.26	0.28	0.30	0.36	0.39
	Mountainous	0.35	0.37	0.40	0.48	0.52
500-yr	Level	0.55	0.59	0.63	0.77	0.83
	Rolling	0.66	0.70	0.75	0.91	0.99
	Mountainous	0.88	0.93	0.99	0.99	0.99

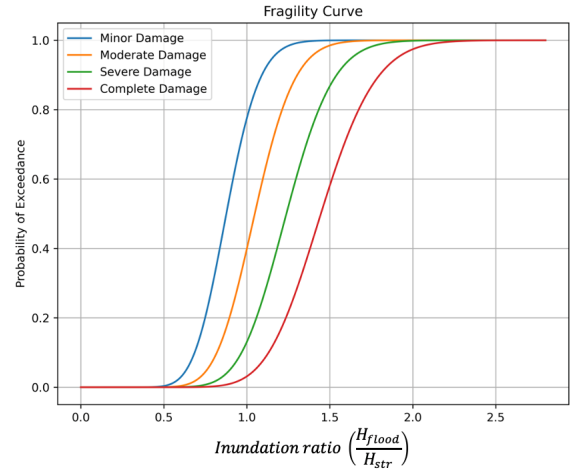
source: Flannery et al., (2017)

Level 1 Example: Vulnerability Modelling in NCHRP 23-32

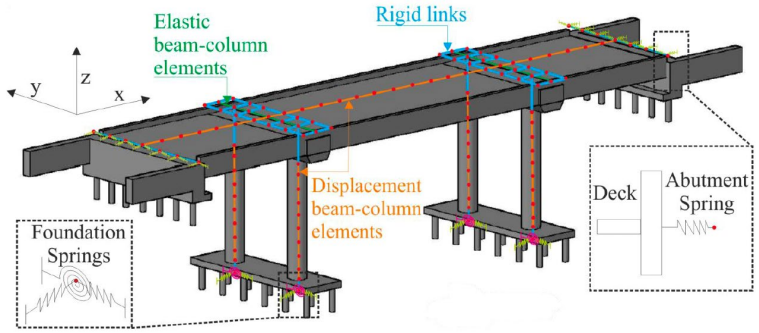
Fragility Curves – Bridge - Flooding TA Pair

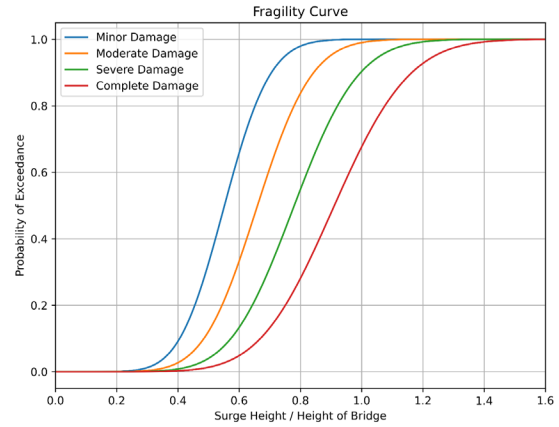
Define Limit State → FEA Modelling → Simulation → Develop Fragility Curves

Limit State	EDP (Lateral displacement)
Minor damage	0.25 inches
Moderate damage	0.75 inches
Severe damage	1.5 inches
Complete damage	2 inches



Fragility Curves – Bridge - Storm Surge TA Pair





Risk Model

Step 1: Threat Data Collection

Identify data sources for threat

Step 2: Asset Data Collection

Identify data sources for asset

Step 3: Vulnerability Assessment

Capture the exposure, condition, sensitivity, and adaptive capacity of the asset to the given threat magnitude

Step 4: Owner Consequence Calculation

Quantify the impacts of asset damage to owner

Step 5: Risk

Quantify risk

Risk Equation: Risk = C * V * T

T: Threat probability (%)

C: Consequence value ($)

V: Vulnerability factor (%)

Example

Determine the probability of exceeding each damage state using Fragility curve

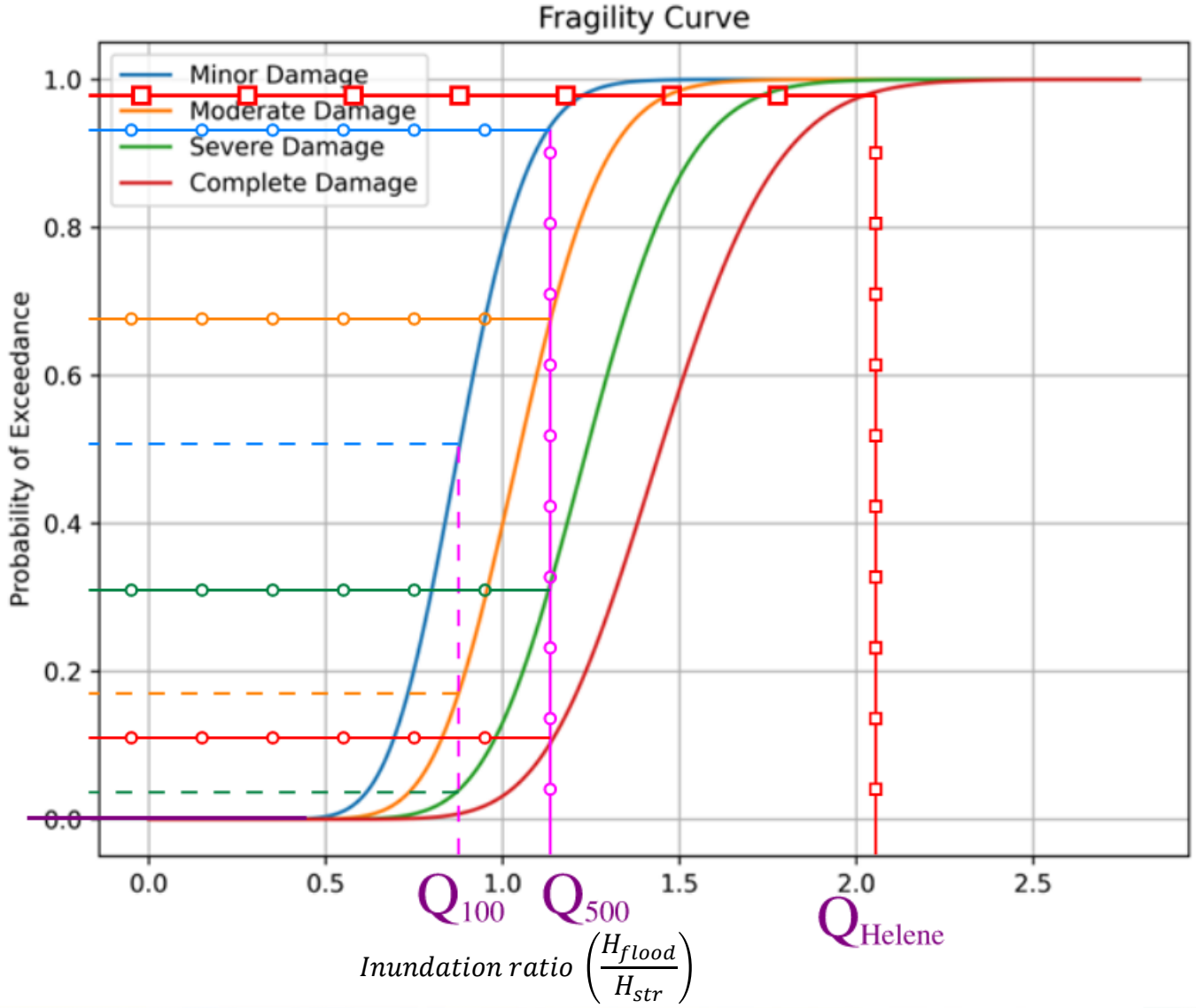


Table 7: Probability of exceedance of Damage States for 500-year flood

Damage State (DS)	Probability of Exceeding a given DS	Probability of being only in a given DS
Minor	0.94	0.26
Moderate	0.68	0.38
Severe	0.3	0.16
Complete	0.14	0.14

Example

Annual Risk for Example Bridge

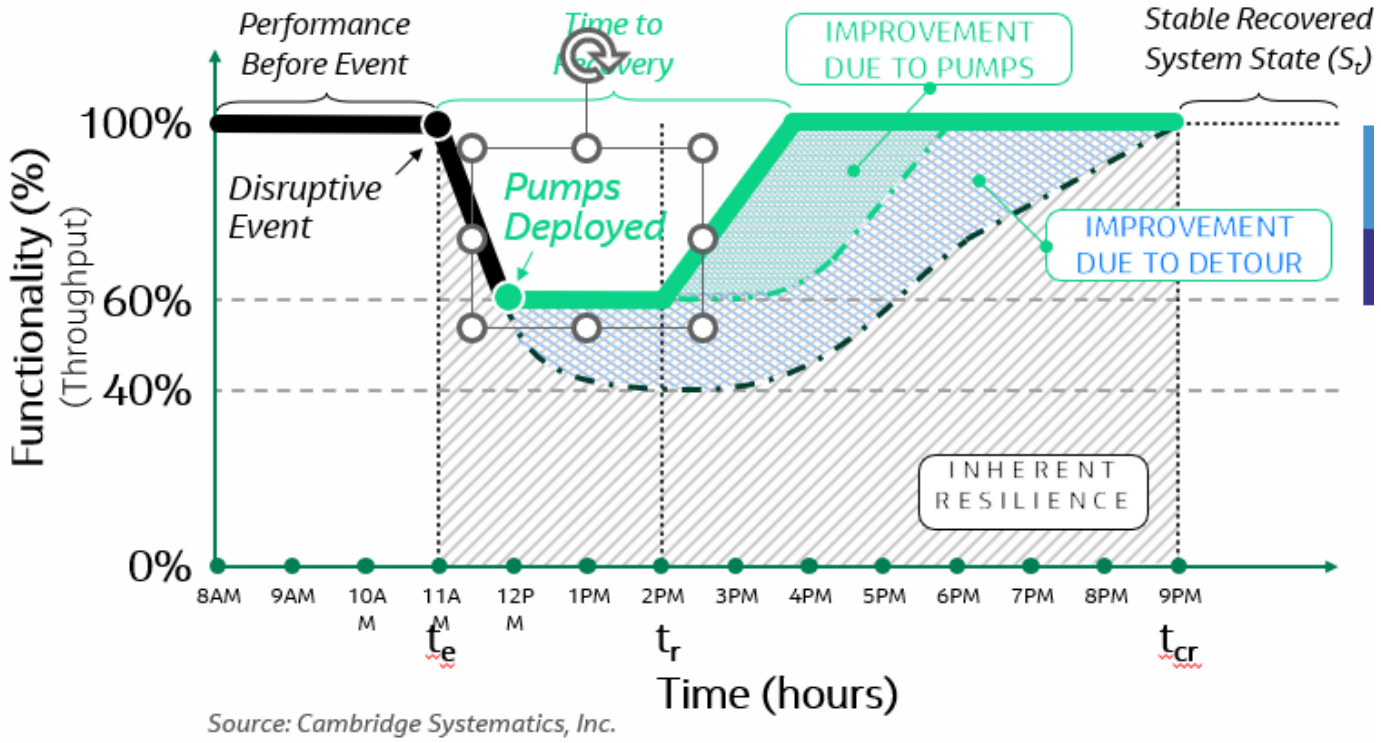
	Consequence	Vulnerability	Threat Probability for 500-year flood	Annual Risk
Minor Damage	$1,055,000	0.26	0.2%	~$550
Moderate Damage	$2,109,000	0.38	0.2%	~$1,600
Severe Damage	$3,164,000	0.16	0.2%	~$1,000
Complete Damage	$4,219,000	0.14	0.2%	~$1,200

Total Annual Risk = ~$4,350

Resilience Modeling

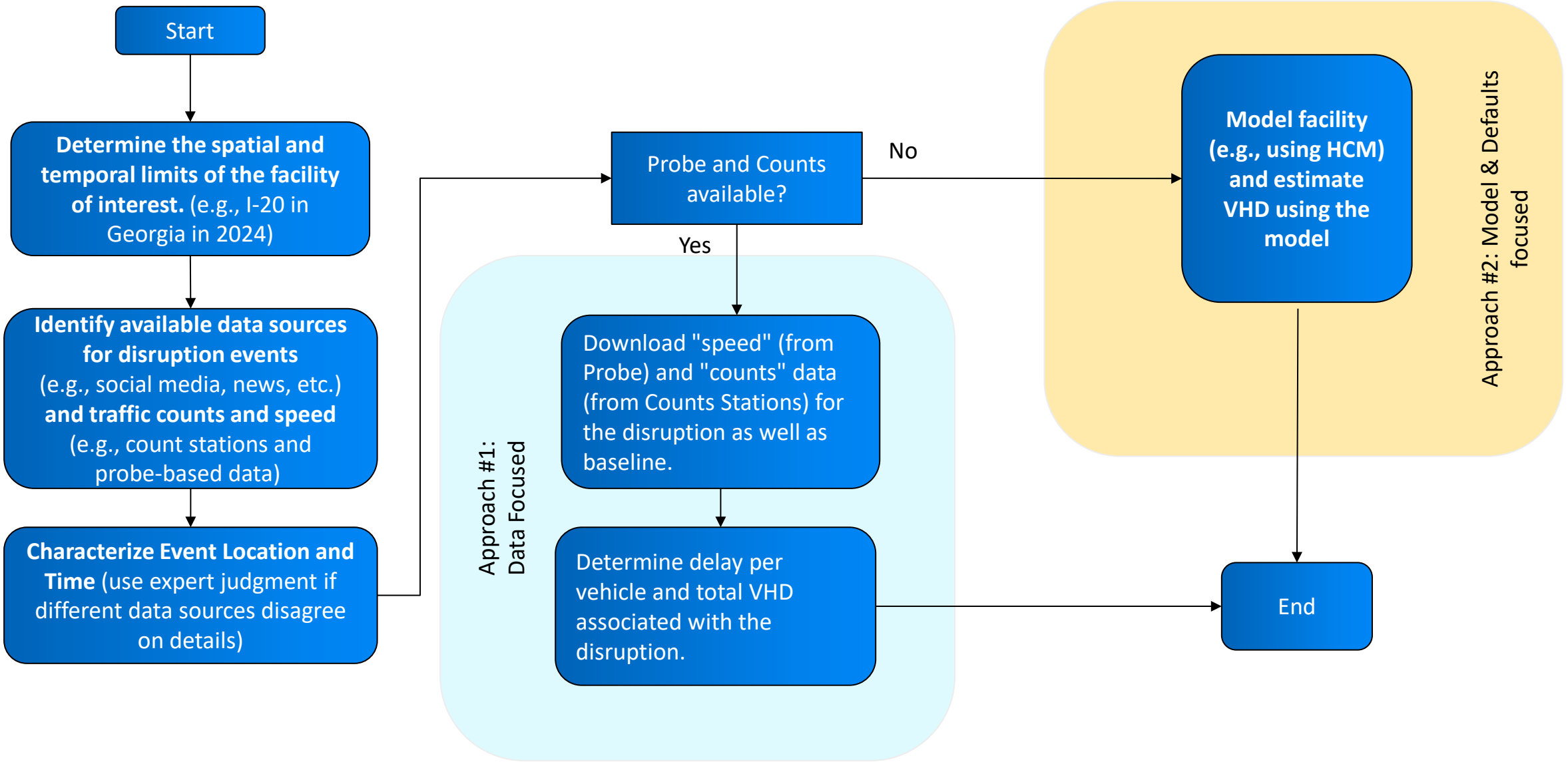
- Rapidity

Partial Closure and Improvements



Source: Cambridge Systematics, Inc.

Approaches Workflow



Colorado DOT – Culvert Prioritization Use Case

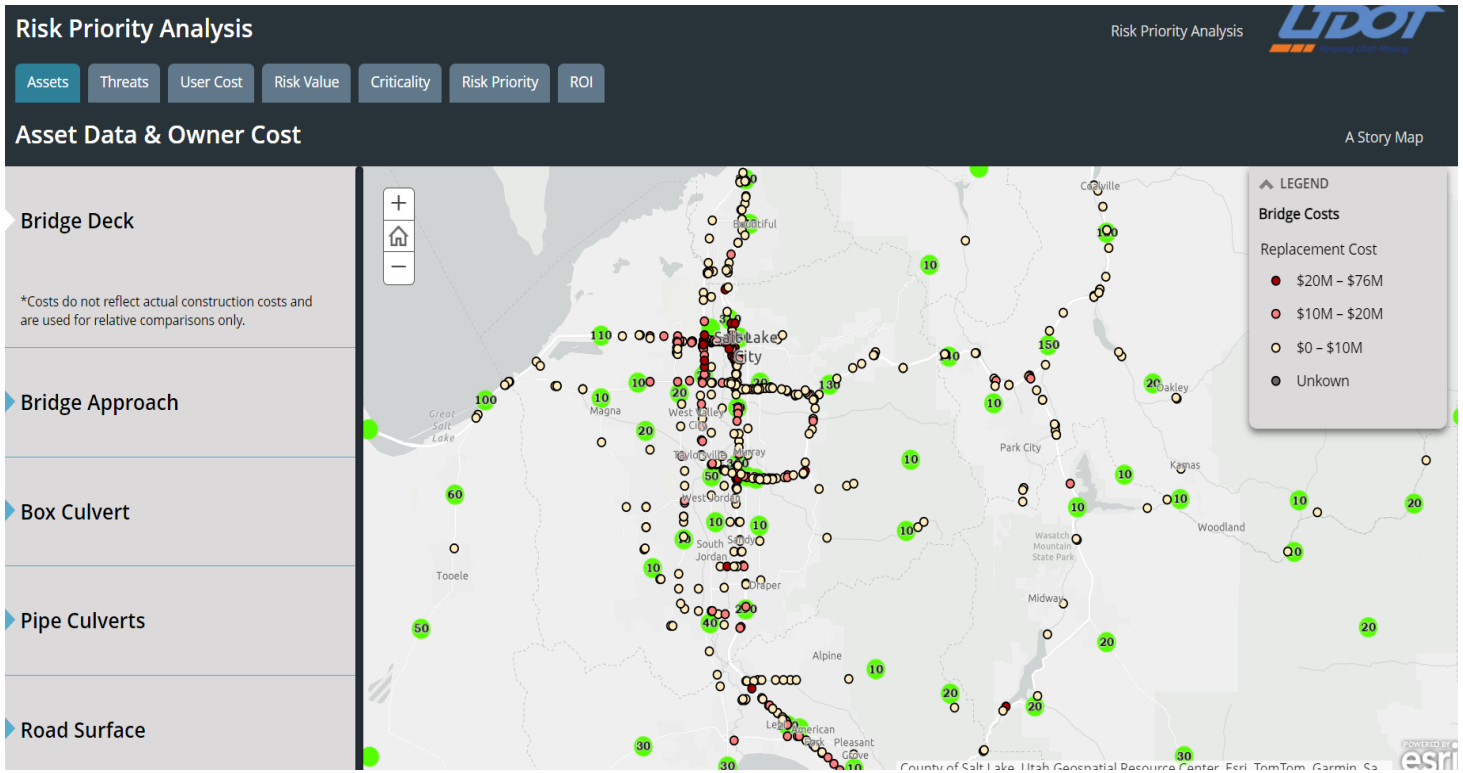
Prioritizing At Risk Culverts

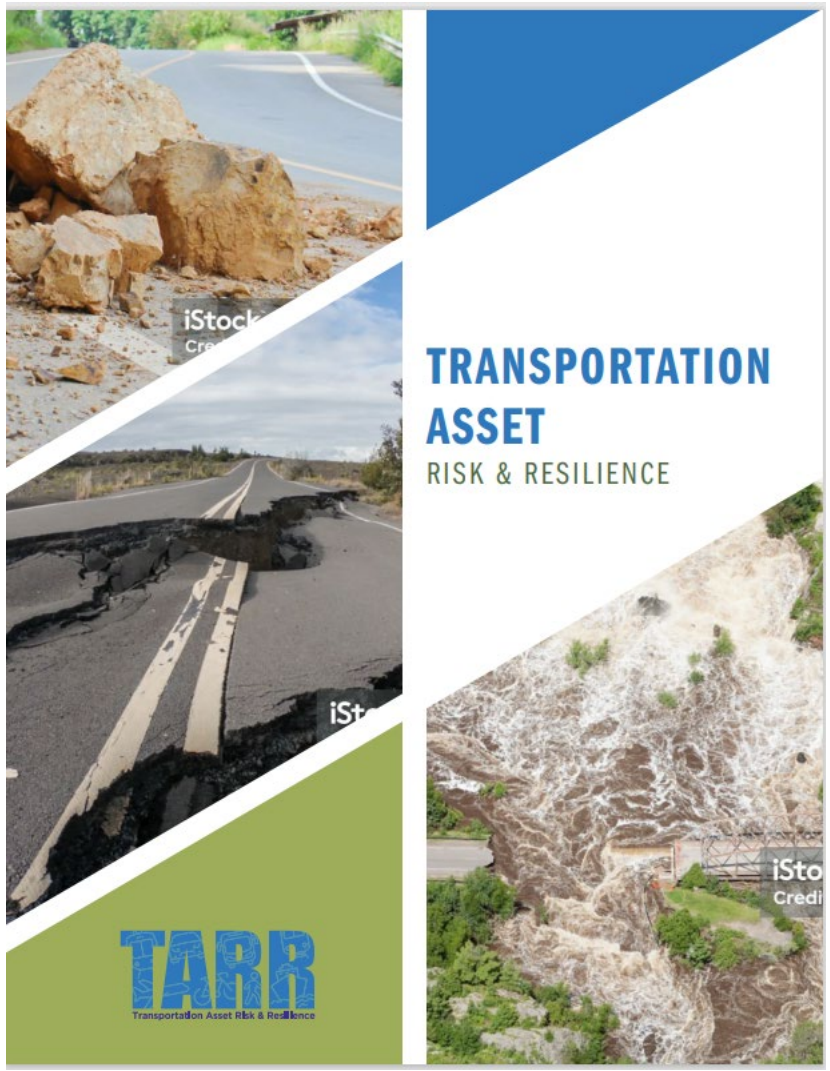
- Step 1: Complete an inspection of identified high-risk culverts
- Step 2: Identify and document specific proposed mitigation action for each culvert based on inspection
  - Capital Improvement (e.g., replace culvert, slip line, etc.)
  - Operational Fix (e.g., increased cleanout frequency, install technology to monitor flows, etc.)
- Step 3: Run risk calculation for both base condition (as is) and mitigated condition – to determine potential risk reduction. Calculate Benefit / Cost.

Source: CDOT, Culvert Risk Mitigation Planning, 2020

Utah DOT – Corridor Planning Use Case

- Model-based data driven approach to natural threats to assets
- Risks are captured on a GIS map to be used in: corridor planning, concept reports, design, and maintenance
- Model-based approach:
  - Informs project delivery
  - Identifies high-priority risks for potential hardening solutions
  - Integrates with concept reports for funding acquisition





Example Cover

Next Steps:

Models refined and completed

Manual drafted, vetted by AASHTO Committees

Project complete November 2026

AASHTO consider for adoption

Questions:

Aimee Flannery, Ph.D., PE

Global Principal Jacobs

Principal Investigator NCHRP 23-32

Aimee.Flannery@jacobs.com

Analysis and Assessment of the National Performance Management Data

Anna Batista

High Street Consulting Group

Analysis and Assessment of the National Performance Management Data

AASHTO Committee on Performance Based Management

September 24, 2025

Disclaimer

This project is sponsored by the Transportation Research Board (TRB) under the National Cooperative Highway Research Program (NCHRP) Program. Any opinions and conclusions expressed or implied in this survey are those of the individuals and organizations who performed the research and are not necessarily those of TRB; the National Academies of Sciences, Engineering, and Medicine; the Federal Highway Administration (FHWA); or NCHRP sponsors.

Information presented is work in progress. Contents of this survey may have not been reviewed by the NCHRP project panel, nor do they constitute a standard, specification, or regulation.

HIGH STREET

Original Goals for TPM: Have We Met Them?

Congressional Goals

1. Refocus on national transportation goals
2. Increase the accountability and transparency of the Federal-aid highway program
3. Improve project decision-making through performance-based planning and programming

FHWA's Desired Outcomes

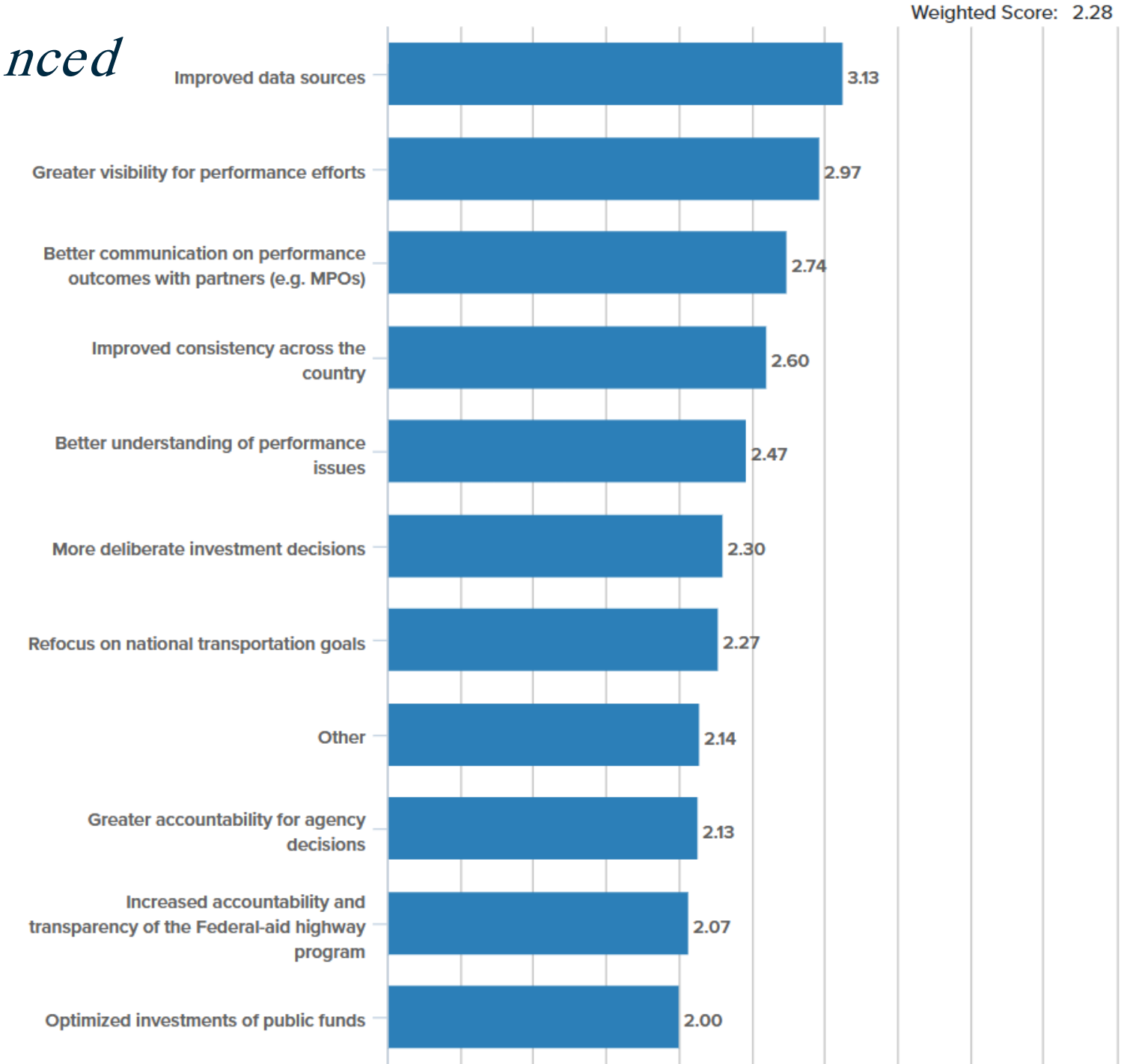
1. Optimize Investments of Public Funds
2. Improve Consistency Across the Country
3. Increase Coordination of Decision-Makers
4. Increase Our Understanding of What Works
5. Communicate Federal Investment Returns

Goals for TPM

Original Goals for TPM Set by Congress and FHWA

- Improve Consistency Across the Country 
- Increase Coordination of Decision-Makers 
- Refocus on National Transportation Goals 
- Improve Project Decision-Making 
- Communicate Federal Investment Returns 
- Increase Accountability and Transparency 
- Optimize Investments of Public Funds 
- Increase Our Understanding of What Works 

To what extent has TPM advanced the following benefits?



TPM Successes

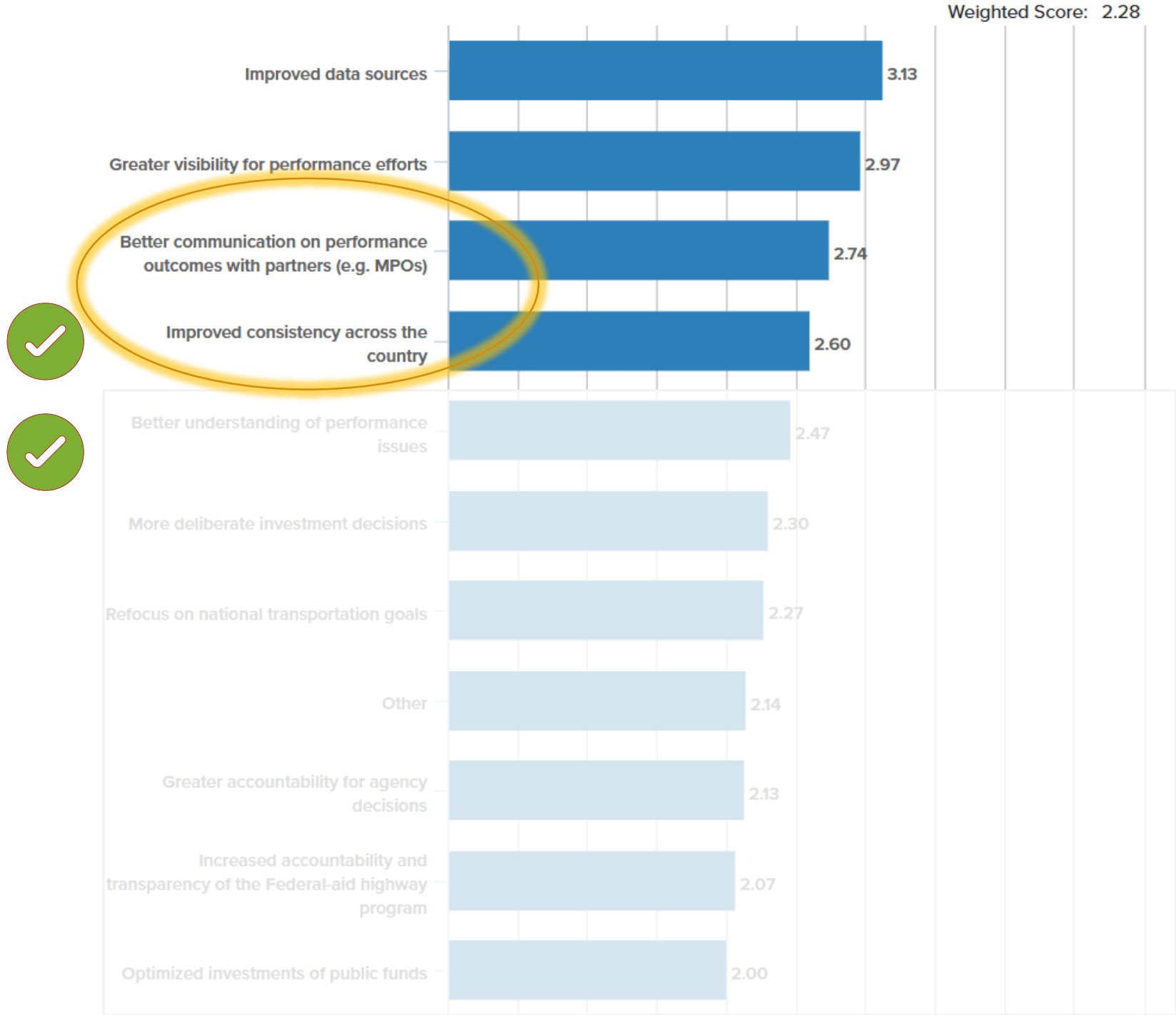
- Improve Consistency Across the Country
- Increase Coordination of Decision-Makers

*"I like the ability to have **consistent** measures across the nation."*

*"You have to at least have a baseline where states report the **same information**."*

*"TPM's benefits include the fact that it **harmonized** what people report."*

*"National measures are the only way to have **peer benchmarking**."*



TPM Successes

- Improve Consistency Across the Country
- Increase Coordination of Decision-Makers
- Improved Data Sources
- Greater Visibility for Performance

Bonus Benefits

TPM Story: Successes

TPM Has Real Benefits

- TPM Provides National Consistency and Comparability
- TPM Data is a Clear Winner
- TPM Has Raised the Profile of Performance-Based Efforts
- TPM Has Improved Interagency Coordination
- TPM is an Effective Vehicle for Communication

Goals for TPM: Partial Progress

Original Goals for TPM Set by Congress and FHWA

- Improve Consistency Across the Country
- Increase Coordination of Decision-Makers
- Refocus on National Transportation Goals
- Improve Project Decision-Making
- Communicate Federal Investment Returns
- Increase Accountability and Transparency
- Optimize Investments of Public Funds
- Increase Our Understanding of What Works

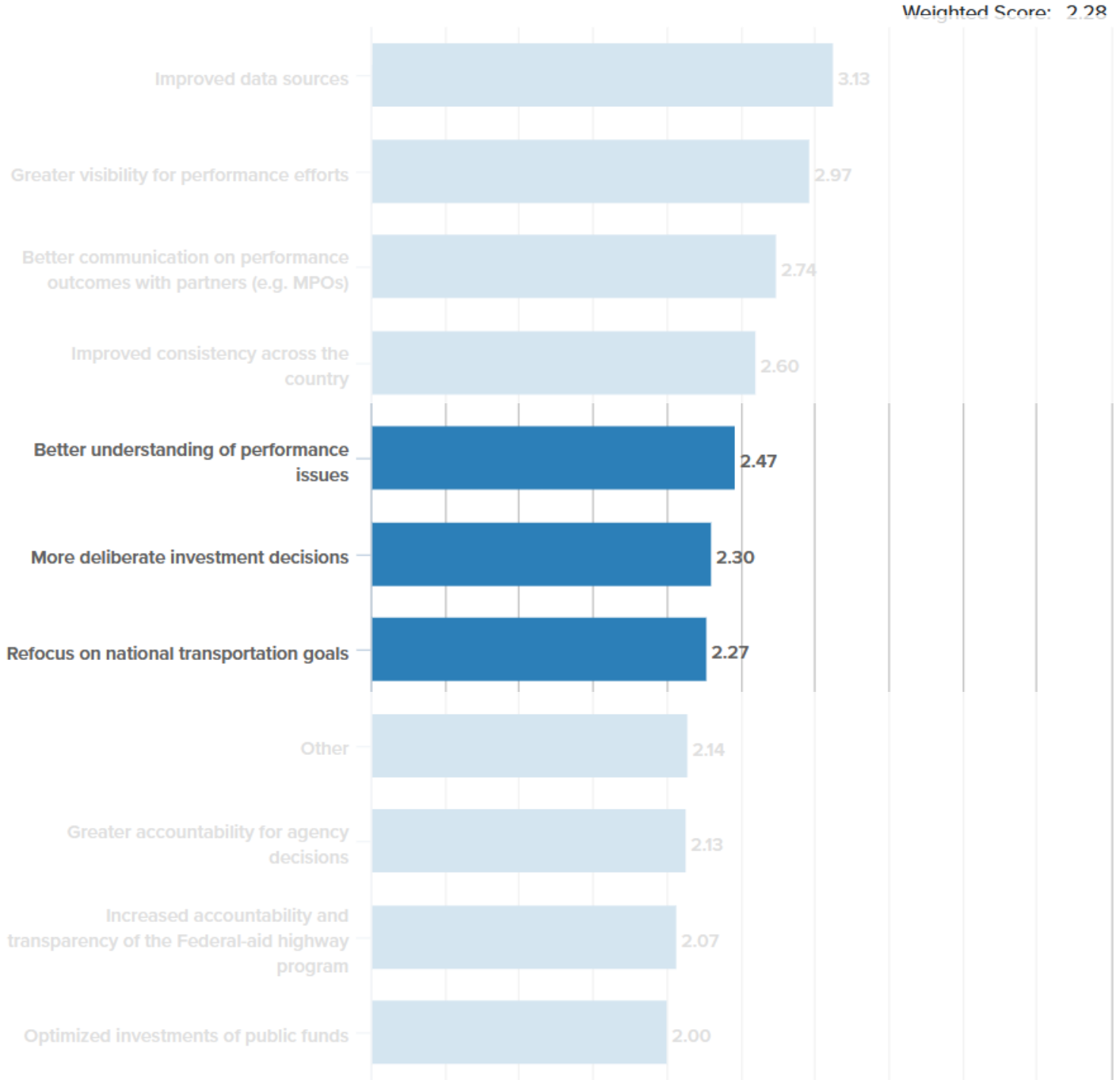
HIGH STREET

TPM Partial Progress

The most important use of a national performance program is to be a communications tool.

"TPM has established a stronger culture of performance management at agencies. In that sense, it's working."

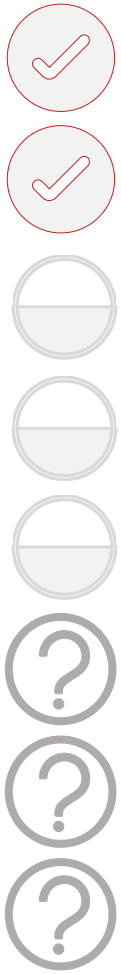
"Performance management is now a 'thing' because of these measures."



Goals for TPM: Limited Evidence

Original Goals for TPM Set by Congress and FHWA

- Improve Consistency Across the Country
- Increase Coordination of Decision-Makers
- Refocus on National Transportation Goals
- Improve Project Decision-Making
- Communicate Federal Investment Returns
- Increase Accountability and Transparency
- Optimize Investments of Public Funds
- Increase Our Understanding of What Works



HIGH STREET

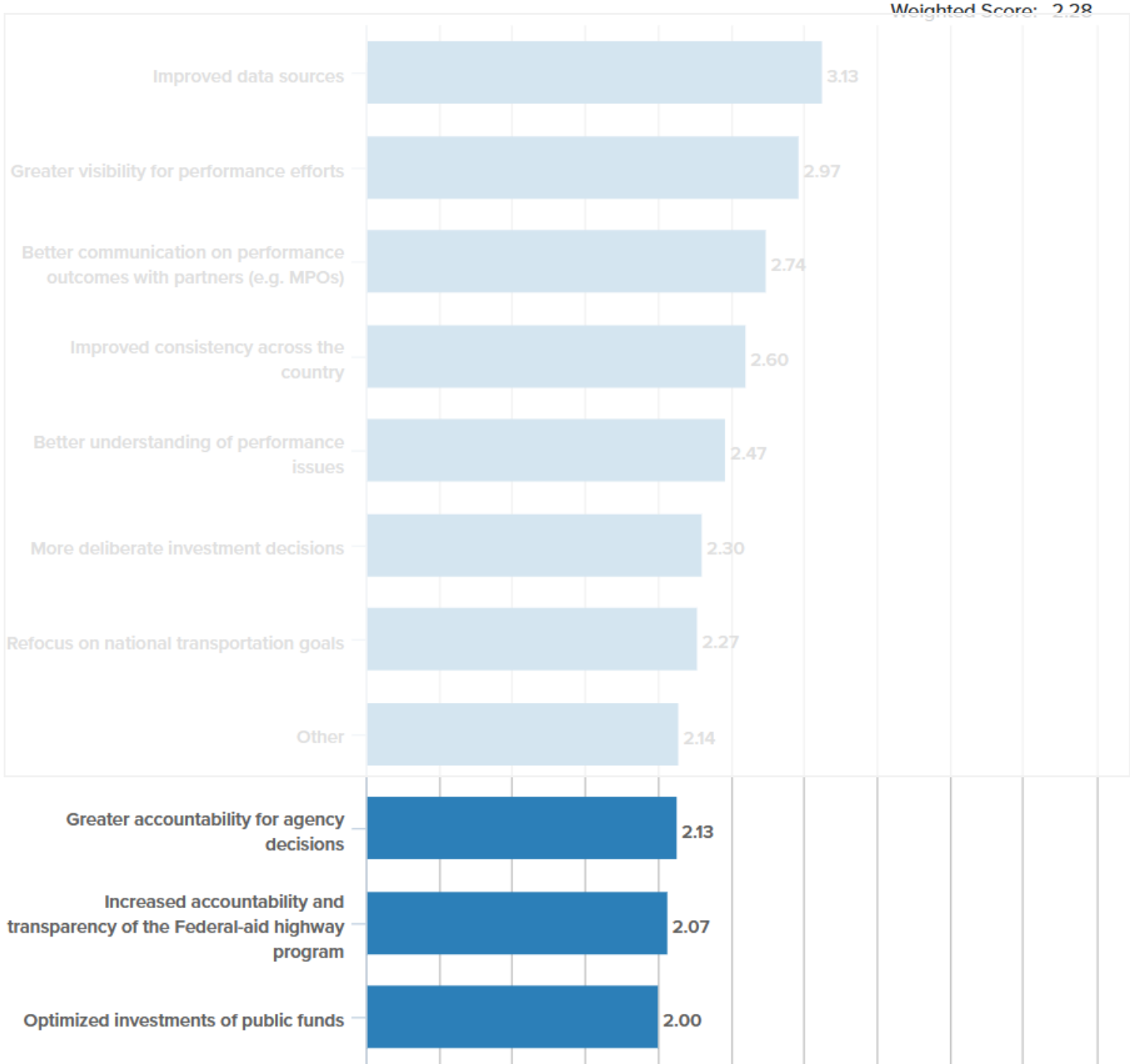
To what extent has TPM advanced the following benefits?

These measures are so high level we do not understand cause and effect.

We have failed to find a correlation between our agency's actions and reliability outcomes.

We are so far from knowing the levers that give you outcomes.

The external forces that influence outcomes often have more effect than any agency's actions.



TPM Story: Challenges

What's Not Working with TPM

The Targets Aren't Working as Intended

- NHS Focus Gives Only a Partial View
- The Timeframe is Too Short
- TPM Requirements and Related Plans Are Not Aligned
- We Still Don't Understand What Influences Outcomes

→Reporting Feels Performative

→ Federal Measures Do Not Drive Investment Decisions

HIGH STREET

Measure & Metric Support

TPM Measures

- PM1: Safety Measures are generally supported, though timeline and other tweaks proposed
- PM2: Pavement measures require industrywide discussion to garner support
- PM3: Some measures are not used at all and offer opportunity to streamline TPM's slate of measures

TPM Story

A Future Vision for TPM

- Revisit TPM's Purpose
- Focus on Data and Tools
- Fewer, Simpler Measures
- Replace Target Setting with "Something Else" for System Performance Measures
- Shift the Focus of Reporting Away from Compliance & Culpability
- A More Active Federal Role in Practice Maturity

CPBM2025 Accomplishments and 2026 Action Plan

	AASHTO Goals			AASHTO Strategies				
Action	Safety, Mobility and Access for Everyone	National Transportation Policy Leadership	Organizational Excellence with World Class Services	Policy, Implementation and Research	Partnership and Collaboration	Workforce Development	Member Engagement	Organizational Optimization
Support and strengthen the committee and subcommittee knowledge portals to share knowledge with committee members and the industry.			X		X	X	X	X
Develop and advance agency capabilities by developing needed resources and guidance.	X		X	X	X	X		
Develop and disseminate regular Transportation Performance Management communication products focused on the work of the committee.		X		X	X	X	X	X
Broaden the understanding, application, and use of relevant AASHTO, FHWA, TRB, and other partner organization resources related to Transportation	X	X	X	X	X	X		X

2025 CPBM Action Items

1. Support and strengthen the committee and subcommittee knowledge portals to share knowledge with committee members and the industry.
2. Develop and advance agency capabilities by developing needed resources and guidance.
3. Develop and disseminate regular Transportation Performance Management communication products focused on the work of the committee.
4. Broaden the understanding, application, and use of relevant AASHTO, FHWA, TRB, and other partner organization resources related to Transportation Performance Management.
5. Fully utilize the Transportation Asset Management research management system for the Subcommittee on Asset Management.

2025 CPBM Action Items

6. Develop, support, and coordinate a research program in partnership with USDOT and TRB.
7. Create a robust suite of Transportation Performance Management training resources to support the professional development of AASHTO members.
8. Review and update the Strategic Plan on a regular basis, soliciting the contributions of subcommittees for the development of action items
9. Facilitate the sharing of common and best practices across member agencies.
10. Serve as the AASHTO coordinating body to respond to, exchange information on, and develop federal Transportation Performance Management-related policies (laws, regulations, and guidance).

2025 CPBM Action Items

11. Collaborate and partner with USDOT, TRB, and other organizations to maximize Transportation Performance Management-related results for members and their customers
12. Support and promote the AASHTO Transportation Performance Management technical service program.
13. Meet regularly with committee and subcommittee members to foster collaboration and maintain momentum on actions

CPBM 2026 Action Plan

www.menti.com

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CPBM Research Roadmap

Need Your Input!

- Use QR Code to go to CPBM Research Roadmap Input Site
  1. Review briefing packages
  2. Make your input on the briefing packages and overall CPBM research needs
- You can also go to tpm-portal.com and find the site

https://www.tpm-portal.com/2025-cpbm-research-roadmap-feedback/

Future CPBM Annual Meetings

- 2026 – San Diego, California
  - Mike Johnson, Caltrans
- 2027 – Austin, Texas
  - Jim Padilla, Texas DOT
  - Opportunities to meet with other AASHTO Committees

Join a Subcommittee!

Upcoming CPBM Meetings

- Subcommittee on Asset Management
  - Wednesday 10/15/25; 1:00pm (eastern)
- Subcommittee on Risk Management
  - Monday 10/13/25; 1:00pm (eastern)
- Subcommittee on Policy and Rulemaking
  - Tuesday 11/11/25;1:00pm (eastern)
- Subcommittee on Research
  - Friday 11/14/25; 2:00pm (eastern)
- Subcommittee on Organizational Management
  - Tuesday 11/18/25; 12:00pm (eastern)
- Task Force on Emerging Performance Areas
  - Wednesday 11/5/25; 2:00pm (eastern)
- Committee on Performance Based Management Q4 Meeting
  - Thursday 12/4/25; 2:00pm (eastern)

Thank You, Karen Miller!

Wrap-Up and Adjourn

Thank you for your engagement and participation!