



# **AASHTO Committee of Performance-based Management - Research Subcommittee**

**Edgardo Block, CTDOT (Chair)**

**Alma Mujkanovic, GDOT (Vice Chair)**

2025 CPBM Leadership Meeting

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## The CPBM Research Subcommittee Purpose

- Focused on research needs of state DOTs
- Elicit research needs across the scope of the CPBM and facilitate the development of Research Needs Statements (RNSs)
- Provide Research-related tools and resources to the CPBM community
- Coordinate with CPBM subcommittees on prioritizing RNS
- Submit the RNSs to CPBM leadership and subsequently to NCHRP



## CPBM Sub-Committee Members and Participants

- Edgardo Block and Alma Mujkanovic, (Chair, co-Chair)
- Liaisons with Subcommittees
  - Jack Smith (NDDOT) - PR
  - Jim Padilla (TxDOT) – EM
  - William Johnson (CDOT) - RM
  - Matt Versdahl (WsDOT) - AM
- All are welcome to attend and participate
- Liaisons with other organizations (FHWA, TRB)
- Bi-monthly meetings (Odd months, 2<sup>nd</sup> Friday, 2PM Eastern)



# Research Subcommittee Update: 2025 Achievements, Products, and Resources

- **Research Strategy Map**
  - Outlines goals, objectives and final outcomes
  - Lists the subcommittees' priorities for this FY
  - Defines what success looks like
- **Research Needs Database**
- **Research Video**
- **? Statements submitted and ? approved for funding**

## Members

Asset Management  
 Organizational Management  
 Risk Management  
 Emerging Measures  
 Cross Cutting/Other

## Mission

AASHTO's CPBM Research Work Group is responsible for identifying priority performance management-related research and for disseminating and implementing research results.

## Primary Customers

State DOTs

### Goals

Increase Participation and Engagement

Identify Priority Research Needs

Empower DOTs to Generate Research Ideas

Enhance Research Tools and Resources

Promote Completed and/or Implemented Research Projects

### Objectives

**Set** clear and measurable meeting outcomes

**Appoint** CPBM coordinators

**Engage** members through active participation

**Pre-identify** research areas

**Host** research symposium

**Coordinate** with CPBM/TRB sub-committees on RNS solicitation

**Identify** DOTs' research needs

**Develop** 3 RNS per subcommittee

**Rank** recommended projects

**Update** research database

**Develop** materials, surveys, and summaries

**Make** resources available

**Present** research findings

**Celebrate** implementation successes

**Review** interim deliverables

### Outcomes

**Increased** participation

**Productive** and interactive meetings

**Higher** group engagement

**Increased** number of RNS

**More** diversified research

**Higher** level of coordination

**Enhanced** participation & engagement from DOTs

**Better** served DOTs' needs

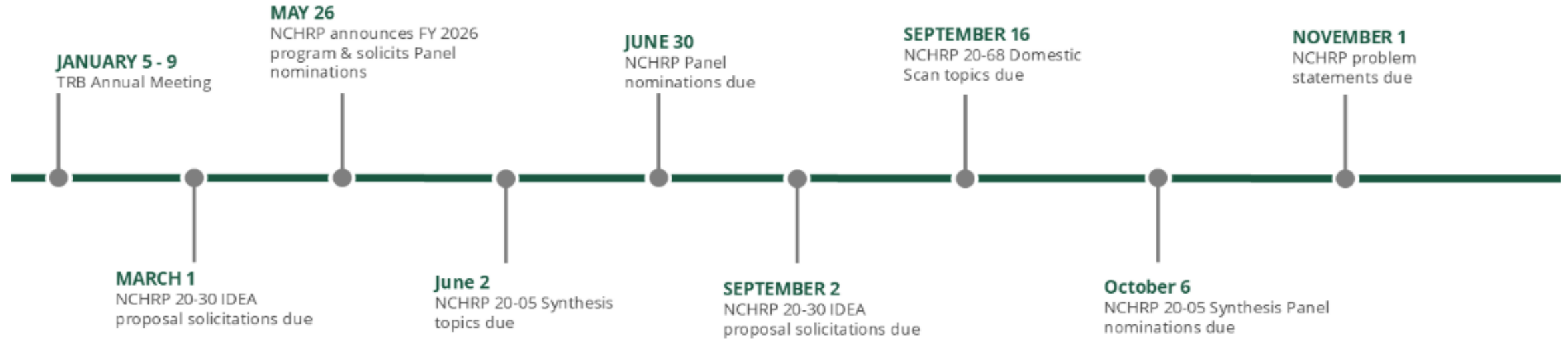
**Enhanced** tools and databases

**Improved** meeting support

**Increased** awareness of completed studies

**Higher** implementation successes

### Key NCHRP dates for 2025



- Improving Analysis of Demand for Non-Auto Travel (EM) – 24 months; \$400K
- Implementing Effective Community Resilience Performance Management (EM) – 24 months; \$300K
- Guidance on Measuring Organizational Efficiency at State Departments of Transportation (OM) – 24 months; \$400K
- Aligning Relationships Between Transportation Asset Management, Planning, and Programming Inclusive of Emerging Objectives of Mobility and Climate Resilience (AM) – 36 months; \$400K
- Create a Performance Management “Blue Book” (CC) – 24 months; \$800K

- Top statements and volunteers identified at 2<sup>nd</sup> Research Symposium for each subcommittee area
- Need to take RNSs to a draft form for prioritization by Leadership in short order (approx. 2 weeks)
- RNSs being worked on in
  - Emerging Measures (last subcommittee virtual meeting)
  - Risk Management (related to ongoing NCHRP 23-32)
  - Asset Management (from subcommittee meeting)

# Research Roadmap Overview and Input



September 25, 2025

[ahaslides/CPBMCHARM](https://ahaslides/CPBMCHARM)

# Agenda

- 1. Project Overview**
- 2. CPBM Subcommittees' Research**
- 3. Other CPBM Research**
- 4. Organization of Future CPBM Research Needs**
- 5. Trends to Consider**



# Objectives

- **Build a pipeline of CPBM research priorities**
  - Build on the work conducted by the CPBM Research Subcommittee over the past five years to identify and prioritize research topics that support performance-based management practice and innovation
- **Engage CPBM stakeholders to ensure roadmap relevance and value**
- **Produce actionable research need statements that support CPBM priorities**
- **Provide a short-term implementation-oriented plan for moving research needs forward**



# CPBM Research – Historical Pipeline

- **Last five years of CPBM research development process**
- **TPM Research Management System**
  - 234 research needs/statements from the last five years (37 are in current CPBM research pipeline)
- **CPBM Research Symposiums**
  - 2 conducted each year
  - Ideas developed and prioritized
- **NCHRP 20-24(97) Advancing Performance Management Under a National Framework (2014 – 2015)**



# Common Themes from Past 5 Years

Total research needs/statements from RMS: 234

1. **Workforce & Organizational Capacity**
2. **Equity, Diversity, and Public Value**
3. **Resilience, Risk, and Climate**
4. **Technology & Digital Transformation**
5. **Performance Measures & Target-Setting**
6. **Sustainability & GHG Reduction**



Share your  
thoughts on  
this list!



# CPBM Subcommittees Research

- **Transportation Asset Management (TAM)**
- **Risk Management (RM)**
- **Organization Management (OM)**
- **Emerging Measures (EM)**



# Briefing Packages

- **Purpose**

- Share historical information and observations
- Identify starting point for discussion of key themes
- Provide basis for review of existing candidates – identify what is no longer relevant, what are new areas not yet considered

- **Contents**

- Subcommittee scope + list of collaborators (AASHTO Committees, TRB, other groups)
- Key themes (categories) of research – based on historical projects and candidates
- List of candidates by theme area + related recent/active projects (and recommended research from reports if included)
- Questions to consider



# Transportation Asset Management Defined

Transportation asset management (TAM) is a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their life cycle.

It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision making based upon quality information and well-defined objectives.

## Subcommittee Focus

Help improve the state-of-the-practice of asset management in STAs - optimize resources by utilizing performance-based goals and measures for operation, preservation, and improvement of their transportation systems.



# Transportation Asset Management Research Themes (1 of 2)

- **TAM Performance Measurement**
  - What new or improved performance measures could be developed and used to better inform asset management decisions?
- **Tradeoff Analysis**
  - How to make investment tradeoffs that balance asset condition/state of good repair with safety, resilience, congestion, and other considerations?
- **Asset Lifecycle Management**
  - What treatment strategies can be applied to optimize management of different asset classes throughout their lifecycles considering past experience and potential future changes in demand and facility requirements?
- **Data and Information Systems for TAM**
  - How can we best leverage available data and improve information systems supporting asset management decision making?
- **TAM Integration**
  - How to integrate TAM practice within an agency's Planning, Programming and Risk Management Processes?



# Transportation Asset Management Research Themes (2 of 2)

- **TAM Integration**

- How to integrate TAM practice within an agency's Planning, Programming and Risk Management Processes?

- **Organization and Workforce**

- What organizational models, workforce management strategies, and change management approaches can be applied to sustain or improve asset management practices?

- **Communication and Collaboration**

- What techniques can be used to build understanding of TAM approaches and value and successfully engage internal and external stakeholders?

- **Asset Valuation**

- How can techniques for calculating the value of transportation assets be improved to better inform decision making?



# TAM Subcommittee Briefing Package

**Suggestions for improvements?**

**What are research needs that are  
important to consider?**



# Risk Management Defined

Risk Management (RM) is defined as the formal and systematic effort to control uncertainty and variability on an organization's strategic objectives by managing risks at all levels of the organization. It encompasses strategic, program, project, and activity-level risks.

## Subcommittee Focus

Facilitate the implementation of risk management approaches in STAs - equipping them with tools and strategies to leverage opportunities and address potential threats.



# Risk Management Research Themes

- **Characterizing Threats, Assessing Risks, and Communicating About Risk and Resilience**
  - What techniques can be used to identify and understand potential threats, and analyze their likelihood and potential impacts on a transportation agency's ability to attain its performance objectives?
- **Advancing Risk Analytics**
  - How can analytics be applied to identify, analyze, and predict potential threats and opportunities to enable informed decision making and proactive risk mitigation?
- **Integrating Agency Risk Management Processes**
  - What can agencies do to improve and integrate risk management processes and practices at the strategic, program, project, and activity levels?
- **Advancing Consideration of Risk and Resilience in TAM**
  - How can agencies advance practice for considering risk and resilience within transportation asset management?



# **RM Subcommittee Briefing Package**

**Suggestions for improvements?**

**What are research needs that are  
important to consider?**



# Emerging Measures Defined

Emerging transportation performance measures (EM) are performance measures that have not yet been widely applied within STAs. They generally have one or more of the following characteristics:

1. multimodal perspective
2. user-centric as opposed to facility-centric perspective
3. measurement of broad objectives such as accessibility, reliability, sustainability, fairness, economic vitality, and quality of life
4. use of new data sources and/or technologies for measurement

## Subcommittee Focus

Improve how state transportation agencies (STAs) conduct performance management by identifying emerging performing areas, making recommendations for future research, and creating a platform for knowledge exchange.

# Emerging Measures Research Themes

- **Resilience Measures**

- How to integrate resilience measures within an agency's TPM, TAM, and RM processes?

- **Stakeholder Measures**

- How to measure and integrate consideration of how costs and benefits of transportation investments are distributed across different user communities and stakeholders within the programming process?

- **Economic, Social, Safety, and Public Health Measures**

- What techniques can be used to assess the economic, safety, social and public health impacts of transportation projects?

- **Multimodal Measures**

- How to develop, calculate and use multimodal mobility and accessibility measures within transportation planning and programming?

- **Leveraging Data Sources for Emerging Measures**

- How can transportation agencies acquire and integrate various data sources to support development of emerging performance measures?



# **EM Subcommittee Briefing Package**

**Suggestions for improvements?**

**What are research needs that are  
important to consider?**



# Organization Management Defined

Organizational Management (OM) is the process of organizing, planning, leading and optimizing resources within an agency with the overall aim of achieving its goals and objectives.

The concept of organizational management is based on the idea that there is a correlation between an agency's capabilities in people, operations, and agency strategies to successfully implement their goals and objectives.

## Subcommittee Focus

Development and implementation of organizational performance management processes, measures, improvement frameworks and strategies in order to optimize the efficiency and effectiveness of transportation agencies.



# Organization Management Research Themes

- **Organizational Models**

- How does the organizational structure of a transportation agency impact its ability to make performance-based decisions and maximize its effectiveness?

- **Efficiency and Process Improvements**

- How can transportation agencies track and improve their internal efficiency? What approaches to process improvement can be considered?

- **Organizational Change**

- What models, methods, and leadership strategies can transportation agencies consider to improve organizational performance and adapt to a changing environment?

- **Leveraging Technology**

- How can DOTs best leverage emerging technologies to meet organizational needs and improve efficiencies?

- **Workforce Management**

- What strategies can DOTs use to build workforce capacity and engagement to meet evolving organizational needs?



# OM Subcommittee Briefing Package

**Suggestions for improvements?**

**What are research needs that are  
important to consider?**



# Other CPBM Research

- **Cross Cutting Themes**

- Process integration (TPM, TAM, RM, Planning & Programming)
- Data and information management & governance
- Visualization and Communication
- Technology Adaptation

- **Topic Areas Not Covered by Subcommittees**

- TPM guidance and manuals
- Federal TPM requirements - response and input



**Share your thoughts on other CPBM  
research needs**



# Organization of Future CPBM Research Needs

- A. Measuring and Communicating what Counts** – Aligning with agency goals and objectives; leveraging the best available information, technologies, and methods
- B. Acting Based on Performance Information** – Making performance-driven, risk-based decisions in planning, programming and operations, in collaboration with partners
- C. Strengthening Organizational Capacity** – Developing a capable workforce, improving internal structures and processes, cultivating a performance-based culture
- D. Sharing Experience and Leveraging Research** – Leveraging available research and guidance through dissemination and implementation support; sharing challenges and successes across agencies through syntheses, scans, workshops, and peer exchanges.



**Share your thoughts on the organization  
of Future CPBM research needs**



# Trends to Consider

## Societal trends, demographics and changing travel patterns

- Increased urbanization, regional population shifts
- Aging population
- Workforce changes – generational differences
- Growing interest in active transportation
- Management philosophy – increased emphasis on agility and innovation

## Technological innovation and new services

- Growing availability of travel data – telematics, GPS, CAVs
- AI advancement and application
- Sensors and image processing advancement
- Advancement in system operations
- CAVs and EVs
- Mobility as a Service
- Micromobility
- BIM advancement – data integration across life cycle
- Digital workplace – telecommuting
- New project delivery methods
- Elevated cybersecurity risk

## Governmental transition

- Shifting priorities
- Funding uncertainties
- Transportation reauthorization

## Economic trends

- Growth in e-commerce, last mile delivery
- Changes in international trade patterns
- Labor shortages for certain sectors (construction, logistics)
- Rising construction costs
- Changes in freight distribution networks

## Environmental challenges

- Extreme weather – wildfires, coastal erosion, flooding
- Sea level rise



**Share your thoughts on the trends to consider**



# Next Steps

- **Feedback from CPBM Annual Meeting attendees & CPBM members**

- Input from this meeting
- Website with briefing packages available for input/feedback
- You can also go to **tpm-portal.com** and find the site



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

- **Draft CPBM Research Roadmap**



# Thank You!

Edgardo Block, Alma Mujkanovic, Hyun-A Park

