

NCHRP 20-123(04)
**DEVELOPMENT OF A RISK MANAGEMENT STRATEGIC
PLAN AND RESEARCH ROADMAP**

APPENDIX I
**TASK 6 – COMPREHENSIVE RISK MANAGEMENT STRATEGIC
APPROACH AND ACTION PLAN**

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Objective

The objective of this plan is to describe the specific goals, strategies, and actions that could be supported by AASHTO committees and councils, FHWA, and the TRB to advance Risk Management (RM) and mature into an implementable national strategy.

Background

Conducted as part of NCHRP research study 20-123(04) titled “Development of a Risk Management Strategic Plan and a Research Roadmap”, the Comprehensive Risk Management Strategic Approach and Action Plan was principally laid out in an industry workshop held on June 30, 2021. Workshop participants, including state DOT, FHWA, AASHTO, and TRB members, conducted a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis to frame their thinking, brainstormed and prioritized goals, and identified strategies to support the highest-ranked goals. The Strategic Planning Workshop deliverable provides detailed work products from the session and formalizes the structure of mission, goals, strategies, and actions for future reference.

The Risk Management Strategic Approach and Action Plan established here, when supported and endorsed by AASHTO and its members, will pave the way for state departments of transportation (DOTs) and other partners to engage, plan, and program projects and activities in support of RM.

Comprehensive Risk Management Strategic Approach and Action Plan

The strategic approach and action plan includes elements of a traditional strategic plan, including a mission, goals, and actions. It is intended to serve as a cross-cutting document to guide and provide input to multiple AASHTO committee strategic plans and related documents.

Mission Statement

The development of an action-based mission statement was used to define the workshop participants’ objective and audience. During the June workshop, the

participants created the following mission statement based on what they believed this document should achieve.

*The mission of this risk management strategic approach and action plan is to **provide a practical guidance for state DOTs and other transportation agencies** (a “national strategy”) so they can **advance and implement risk management within their organization.***

Goals

Goals establish something to reach for and achieve. They identify an existing state in the topic and project a sought-after result. In this case, workshop participants developed and refined the goals based on what they thought would help achieve the established risk management mission statement. The goals developed were:

- A. Establish a scalable framework for building RM practice in transportation agencies that can be applied appropriately in different agencies.
- B. Identify and enhance existing analytical tools and datasets for RM and develop new ones.
- C. Broaden RM to include all stakeholders of the national transportation system and the broad community of stakeholders.
- D. Enhance understanding and implementation of RM in agencies and among stakeholders (e.g., system users, lawmakers, public interest groups, local governments, etc.).
- E. Develop a business case for why RM is important, modeled on lessons learned from the private and public transportation sectors, as well as other sectors.
- F. Help agencies develop a RM culture by breaking down silos and integrating RM best practices.

These goals not only set a standard for what practitioners want to see, but also fill the RM knowledge gaps identified prior to the workshop in a state-of-the-practice literature review. The gaps include:

- Measurement and Quantification of Risk,
- Data and Tools,

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- Integration with Existing Process,
- Communication and Coordination,
- Retrospective Evaluation, and
- Workforce Capacity and Modernization.

The Responsibility Matrix in Table 1 (next page) indicates how each of these knowledge gaps can be addressed by the goals and identifies potential AASHTO committees and current leaders who are well positioned to lead them. Connecting the goals and gaps together validates and addresses the concerns and needs expressed by the practitioners.

Table 1. Responsibility Matrix

Goal	Knowledge Gap(s) Addressed	Recommended AASHTO Committee Lead and Support/Coordinating Committee	Recommended AASHTO Liaison
Establish a scalable framework for building risk management practice in transportation agencies that can be applied appropriately in different agencies.	<i>Measurement and Quantification of Risk</i>	Lead: Subcommittee on Risk Management <i>Support/Coordinating: Transportation System Security and Resilience</i>	Matt Hardy supported by Melissa Savage
Identify and enhance existing analytical tools and datasets for risk management and develop new ones.	<i>Measurement and Quantification of Risk and Data and Tools</i>	Lead: Subcommittee on Risk Management <i>Support/Coordinating: Data Management & Analytics</i>	Matt Hardy supported by Penelope Weinberger
Broaden risk management to include all users and affected parties of the National transportation system and the broad community of stakeholders.	<i>Integration with Existing Process and Workforce Capacity and Modernization</i>	Lead: Committee on Performance Based Management and Transportation System Security and Resilience <i>Support/Coordinating: Subcommittee on Risk Management</i>	Matt Hardy and Melissa Savage
Enhance understanding and implementation of risk management in agencies and among stakeholders (e.g., system users, lawmakers, public interest groups, local governments, etc.).	<i>Communication and Coordination</i>	Lead: Subcommittee on Risk Management <i>Support/Coordinating TransComm; Subcommittee on Organizational Management</i>	Matt Hardy supported by Maggie Kasperski
Develop a business case for why risk management is important, modeled on lessons learned from the private and public transportation sectors, as well as outside insight.	<i>Retrospective Evaluation and Workforce Capacity and Modernization</i>	Lead: Committee on Performance Based Management <i>Support/Coordinating: Subcommittee on Risk Management</i>	Matt Hardy
Help agencies develop a risk management culture by breaking down silos and integrating Risk Management (RM) best practices.	<i>Workforce Capacity and Modernization</i>	Lead: Subcommittee on Organizational Management <i>Support/Coordinating: Subcommittee on Risk Management</i>	Matt Hardy

Action Plan

This action plan illustrates how a DOT can achieve the goals listed above in service of the mission statement and national RM strategy. Strategies set out a guide to how each of the goals could be achieved and actions are the actual steps needed to implement them.

Goal A | Establish a scalable framework for building risk management practice in transportation agencies that can be applied appropriately in different agencies

To achieve this goal, the following strategies and actions could be pursued:

- **Strategy A1** | Review existing research as to how RM practice can be scaled at different levels of maturity.
 - *Action* | Review federal and state research that breaks down an incremental process to achieving RM maturity, such as the *Enterprise Risk Management Playbook* from the U.S. Chief Financial Officers Council.
 - *Action* | Review and refine maturity scales from prior research, including *NCHRP 08-113 Integrating Effective Transportation Performance, Risk, and Asset Management Practices*.
- **Strategy A2** | Define common RM activities and identify an estimated level-of-effort.
 - *Action* | Define a list of common RM activities by reviewing all prior and ongoing research.
 - *Action* | For each common RM activity on the list, identify a level-of-effort on a scale of high-medium-low. This could be done in terms of dollars or hours.
- **Strategy A3** | Model how to scale and evaluate consequence and tolerance for risks.
 - *Action* | Define options to measure risk tolerance. This likely will follow best practice to consider consequence and likelihood, both in the most quantitative terms possible (several TAMPs and other literature have methods for this).
 - *Action* | With a measure in hand, define a scale for acceptable risk tolerance on that measure (or measures).

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- *Action* | Pilot the use of the scale with a set of agencies to model how agencies can define their risk tolerance.
- **Strategy A4** | Develop a scalable framework for building RM practice.
 - *Action* | Generate a diagram/methodology that allows agencies to find risk management activities appropriate for their level of maturity, risk tolerance, and resources/capabilities.

Goal B | *Identify and enhance existing analytical tools and datasets for risk management and develop new ones.*

To achieve this goal, the following strategies and actions could be pursued:

- **Strategy B1** | Provide more learning around using the AASHTO Enterprise Risk Management Portal (ERM) (<https://www.erm-portal.com/>) for providing and sharing tools.
 - *Action* | Review the purpose of the ERM portal and its intended use cases
 - *Action* | Collect use cases for ERM portal through interviews and feedback forms.
 - *Action* | Assess whether the ERM portal is being used in the intended way by the intended audience. Also assess whether additional audiences or use cases are available and could be added to the portal?
 - *Action* | Develop promotional and training materials for the ERM portal aimed at priority audiences and use cases.
 - *Action* | Hold a training webinar on the ERM portal.
- **Strategy B2** | Develop a one-stop shop resource location for RM research.
 - *Action* | Collect a full list of federal and state research products and projects concerning RM. Examples are provided throughout this document. Collectively, the members of AASHTO committees / subcommittees as well as FHWA and TRB Committees should be able to identify a full list.
 - *Action* | Develop a resource page with a name, brief description, year, and link for each research product or project.
 - *Action* | Implement the Risk Management Research Roadmap created within NCHRP 20-123(04).

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- *Action* | Rebrand the ERM portal to be inclusive to all RM efforts and not specific to enterprise risk management.
- **Strategy B3** | Create a means to incubate new tools and datasets. These could include explanatory slide decks and workshop materials, spreadsheet tools for risk register development and uncertainty measurement/management, scripts for computing confidence intervals, historic reference datasets related to risks, etc.
 - *Action* | Identify people (likely members of AASHTO committees/subcommittees) who will be responsible for keeping an “ear to the ground” on RM tool and dataset development.
 - *Action* | Offer to assist the development of RM tools and datasets by connecting the developers (whether a research team or company/transportation agency) with other like-minded individuals with expertise, time, money, or other resources. Encourage collaborative development.
 - *Action* | If the developers agree, share the tool to all practitioners through the ERM Portal.
 - *Action* | Once a tool or dataset is developed and in-use, maintain the capability for users to share their feedback and suggested expansions and refinements.
 - *Action* | Advertise the benefits and success stories of RM tool and dataset incubation on the ERM portal, through webinars, and at conferences.

Goal C | Broaden risk management to include all users and affected parties of the national transportation system and the broad community of stakeholders

To achieve this goal, the following strategies and actions could be pursued:

- **Strategy C1** | Broaden public understanding about why RM is an important consideration for transportation agencies.
 - *Action* | Conduct a survey of successful public communications at transportation agencies about RM.
 - *Action* | Develop a set of “nuggets of truth” that DOTs should be communicating with a public audience about the value of risk management.

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- *Action* | Develop a set of templates – visual, written, and narrative – for agencies to use in conveying “nuggets of truth” on risk management to a public audience.
- *Action* | Conduct implementation pilots at a small number of agencies to validate the templates and produce guidance on how best to deploy them.
- **Strategy C2** | Create easier ways to communicate RM to staff.
 - *Action* | Conduct a survey of successful staff communications at transportation agencies about RM.
 - *Action* | Develop a set of “nuggets of truth” that DOTs should be communicating with different audiences of staff about the value of risk management.
 - *Action* | Develop a set of templates – visual, written, and narrative – for agencies to use in conveying nuggets of truth on RM to different audiences of staff.
 - *Action* | Conduct implementation pilots at a small number of agencies to validate the templates and produce guidance on how best to deploy them.

Goal D | Enhance understanding and implementation of risk management in agencies and among stakeholders

To achieve this goal, the following strategies and actions could be pursued:

- **Strategy D1** | Develop communication methods and materials for RM at the enterprise level. They affect an agency’s ability to function day-to-day and meet the expectations of customers and stakeholders.
 - *Action* | Identify a list of common enterprise-level risks in transportation agencies (e.g., political turnover, insufficient or unreliable funding for programs and projects, or natural or human-made disasters impacting continuity-of-business, including cybersecurity).
 - *Action* | For each common enterprise-level risk or category of risks, assess best practices from the public and private sector for communicating with staff, decision-makers, and outside stakeholders. For example, are there best practices for how the causes and consequences of unstable or inadequate transportation funding has been illustrated for the public? For other industries or government functions? In other countries? In private business?

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- *Action* | Develop templates for communication materials and methods for enterprise-level transportation risk management. These could include white papers and fact sheets, talking points, or interactive multimedia presentations such as websites and videos.
- **Strategy D2** | Develop communication methods and materials for RM at the program level. Program-level risks affect an agency's ability to deliver capital and operating programs to meet performance targets and may include lack of available staff and knowledge, unexpected or unpredictable cost inflation, poor prediction of asset deterioration, diversion of resources to big-ticket projects, lack of contractor availability. Actions are the same as for D1.
- **Strategy D3** | Develop communication methods and materials for RM at the project level. Project-level risks are similar to risks at the program level but specific to individual projects. They may include data availability or validity, cost limitations on level of assessment and development, lack of available and knowledgeable staff and contractors, stakeholder or environmental engagement, project-specific litigation,. Actions are the same as for D1.
- **Strategy D4** | Develop communication methods and materials for RM at the asset level. Asset-level risks are specific to ongoing and planned functions. These functions support projects and programs within the agency and directly impact serviceability of the transportation network. They may include coastal flooding due to sea level rise, riverine flooding from extreme weather events, wildfires, earthquakes, rockfalls, vehicle impacts, damage from permitted work in the right-of-way. Actions are the same as for D1.

Goal E | Develop a business case for why risk management is important, modeled on lessons learned from the private and public transportation sectors

To achieve this goal, the following strategies and actions could be pursued:

- **Strategy E1** | Review existing research that might inform a business case for RM in transportation agencies.
 - *Action* | Identify and review Federal, State, and academic studies of RM in transportation, including *NCHRP 08-93 Managing Risk Across the Enterprise* and the resulting *AASHTO Guide for Enterprise Risk Management*, which is currently being implemented in *NCHRP 20-44(02)*, as well as the anticipated *NCHRP 20-127 Business Case and Communications Strategies for State DOT Resilience Efforts* and *NCHRP 08-151 Building Risk-Management Momentum in Agencies*..

- **Strategy E2** | Perform case studies of RM at agencies with a special focus on executive-level participation and champions.
 - *Action* | Find the best examples of transportation agencies' implementation of RM. If necessary, extend to other public sector agencies in the United States or to other countries.
 - *Action* | Develop a case study of each identified best practice, with special attention paid to the role of executive champions. Ideally, those champions could be interviewed for lessons learned and testimonials to the value of the work.
 - *Action* | Share the case studies so other transportation agencies can learn from them.
- **Strategy E3** | Establish ways of measuring the benefits of RM in transportation agencies.
 - *Action* | Review research that quantifies the benefits of RM in transportation, such as *NCHRP 08-118 Risk Assessment Techniques for Transportation Risk Management*. Consider federal and state benefit-cost analysis practices.
 - *Action* | Develop a set of measures and metrics that quantify benefits of risk management. These could include estimates of dollars saved, hours saved, or even lives saved.
 - *Action* | Develop methodologies to estimate the measures and metrics, and ensure these methodologies are peer-reviewed and accepted by practitioners.
 - *Action* | Develop explanatory materials to implement the measures and metrics. Potentially pursue pilot implementation with one or several agencies.
- **Strategy E4** | Develop the RM business case for transportation agencies.
 - *Action* | Define who agencies manage risk for and which risks agencies are looking to mitigate, based on the products of all the prior strategies.
 - *Action* | Conduct an assessment of the possible costs of RM implementation at agencies of various maturity levels.
 - *Action* | Develop the business case document, laying out the status quo, the audience, the outreach methods, the observed benefits from case

studies, the measurable benefits and how to measure them, and how those benefits compare to estimated costs.

- **Strategy E5** | Define and reach out to an audience for a RM business case, beginning with executives.
 - *Action* | Reach out to agency leaders about types of risk that may not be in current RM practice but that deserve attention.
 - *Action* | Using the case studies as source material, develop a communication toolbox for RM. Such a strategy could include an elevator pitch, brief fact sheets or infographics meant to get the value of RM and potential role of executive champions across powerfully and with brevity.

Goal F | Help agencies develop a risk management culture by breaking down silos and integrating Risk Management (RM) best practices

To achieve this goal, the following strategies and actions could be pursued:

- **Strategy F1** | Develop guidance and shared terminology for front line interpreters of RM (i.e., the people who need to promote RM within an agency).
 - *Action* | Review all existing guidebooks on RM for transportation agencies (mentioned in support of other strategies) and develop a glossary of key terms, strategies, and actions.
 - *Action* | Develop a set of fact sheets for key RM activities and strategies that break down the purpose of the activity, the level-of-effort, the level of executive support required, the likely stakeholders, the tools required, and guidance for how best to be successful.
 - *Action* | Promote the fact sheets for front line practitioners, potentially including webinars and training.
- **Strategy F2** | Hold peer exchanges to allow front-line practitioners to share their best practices among agencies and build a sense of shared purpose.
 - *Action* | Hold a peer exchange on how risk efforts are being aligned at agencies.
 - *Action* | Hold a peer exchange on how RM is organized and managed at agencies.
 - *Action* | Hold a peer exchange on how risk tolerance is defined and enforced at agencies.

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- *Action* | Hold a peer exchange on how RM and awareness of uncertainty (particularly agency and program risk) can be used to create a more holistic approach to investment planning.

The Continuous Implementation Process

This Comprehensive Risk Management Strategic Approach and Action Plan has produced six different goals with associated strategies and actions that AASHTO, along with their respective member state agencies can apply to progress their comprehensive consideration of RM. The goals are not presented in any order nor associated with levels of maturity in order for agencies to implement strategies based on their own unique status quo.

Implementation of some of these strategies require significant investment of time, funds, agency culture, procedural shifting, and organizational alignment. It is important to consider the implementation of RM as incremental, continuous, evolutionary, and unique in each agency. Although this process can be challenging, it will lead to more informed decision-making. Advancing RM may be “easier said than done”, but this action plan provides AASHTO committees/subcommittees a frame for facilitating, advocating and supporting incremental, tangible progress.

Though every DOT would implement this action plan slightly differently, Figure 1 (next page) depicts one possible logical flow with time on the horizontal axis and the knowledge gaps on the vertical. Some goals will serve multiple gaps, illustrating that one set of strategies and actions can broadly improve an agency’s understanding of RM.

Figure 1. Sample Implementation Process Flow

