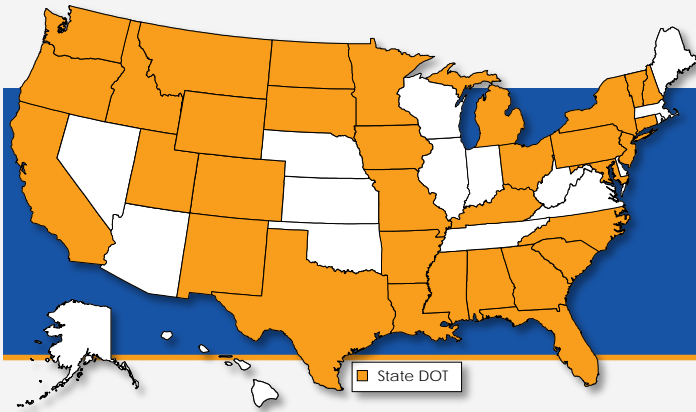


PLANNING SNAPSHOT 10: RISK AND RESILIENCY PLANNING

JANUARY 2017



Funded through the NCHRP 8-36 Research Series, these snapshots are designed to tell you a little about the current state of a specific planning practice of interest today.

Addressing Extreme Weather and Other Risks

How are agencies accounting for changing weather patterns and associated risks through the planning process? This survey was distributed on behalf of SCOP, AMPO, and NARC. The content includes 85 responses from 35 State DOTs and 1 MPO. Some agencies submitted multiple responses. All responses are reported here.

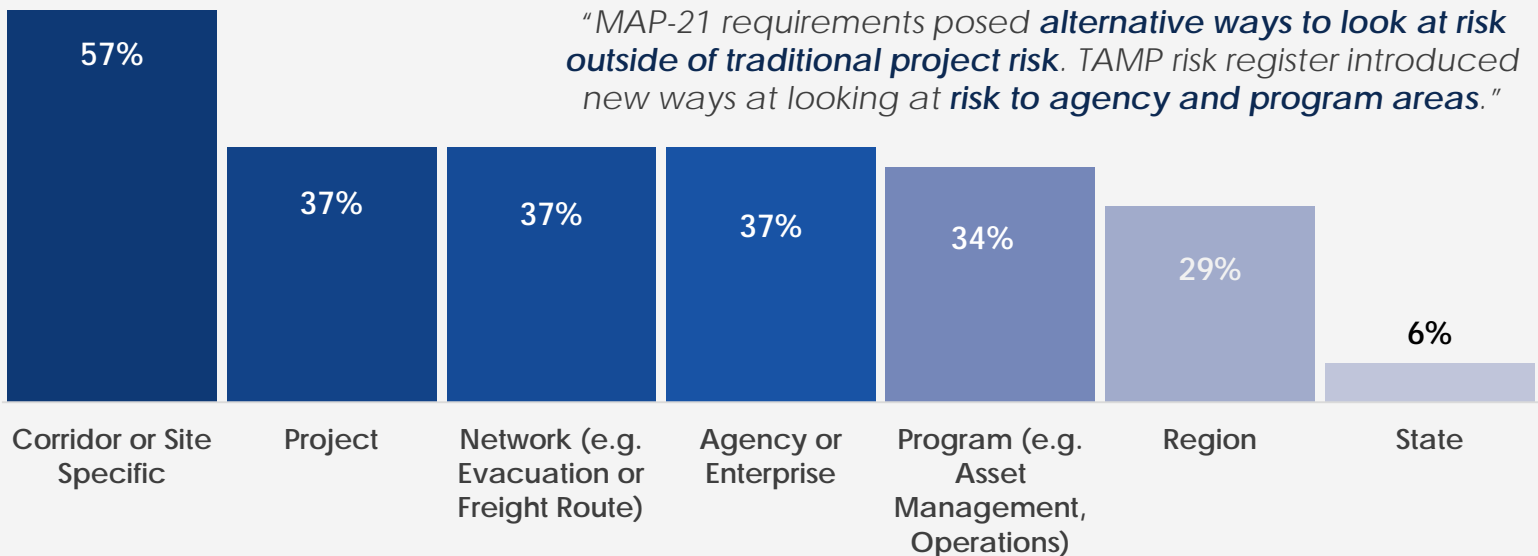
RISK AND RESILIENCY PLANNING

Risk and resiliency planning has come under increasing focus as states face the challenge of adapting to more extreme and unpredictable weather patterns.. Nearly 2/3rds of the 35 State DOTs responding to this snapshot are currently engaged in risk and/or resiliency planning.

To what degree is your agency currently engaged in risk and/or resiliency planning?



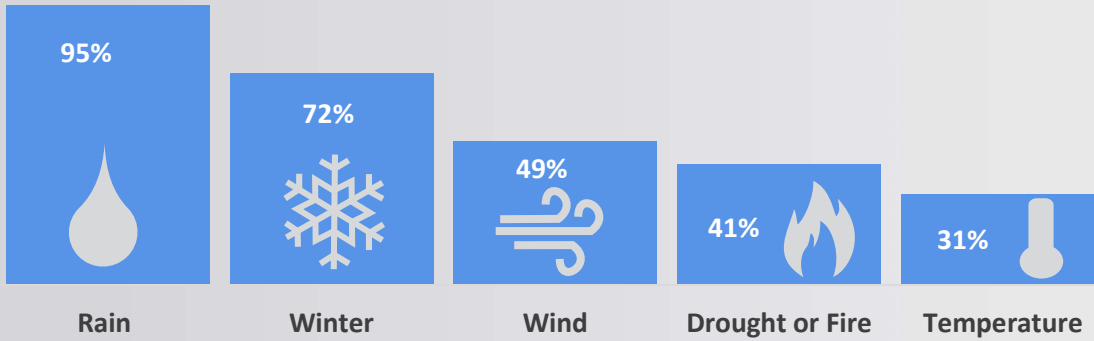
At what level is your agency assessing risk and/or resiliency?



*"MAP-21 requirements posed **alternative ways to look at risk outside of traditional project risk**. TAMP risk register introduced new ways at looking at **risk to agency and program areas**."*

WEATHER AND VULNERABLE INFRASTRUCTURE

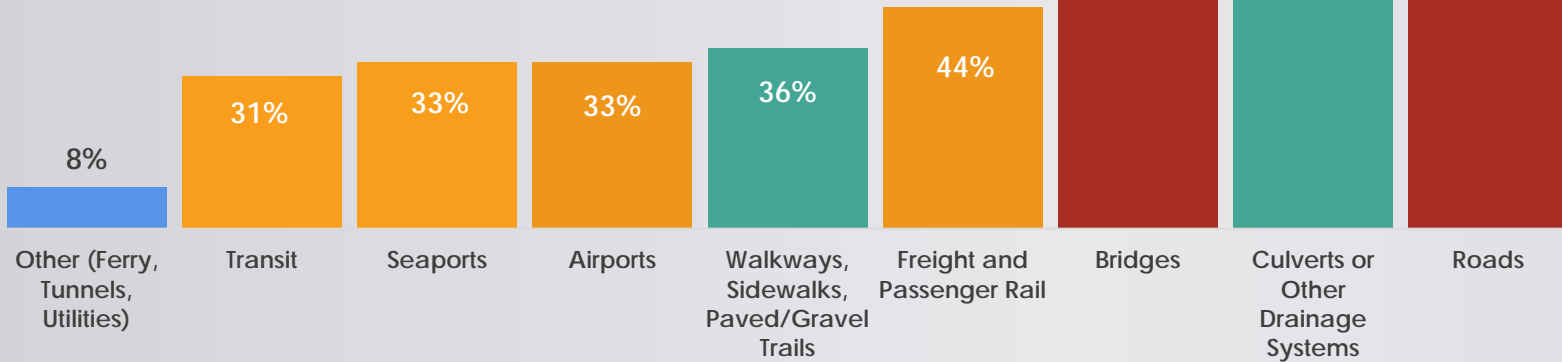
What extreme weather events do you believe are most threatening to your state or region's transportation infrastructure?



In addition to weather events, DOTs consider **sea level rise, storm surges,** and natural disasters like **earthquakes** and **tornados** to be a threat to infrastructure.

What types of transportation infrastructure are most vulnerable to extreme weather and sea level rise in your state or region?

*"The challenge is how to **engage local agencies** when the DOT is not offering new money to **perform risk assessments and/or mitigate risk.**"*



If planning for risk or resiliency what critical risks has your agency identified?



TOOLS AND DATA

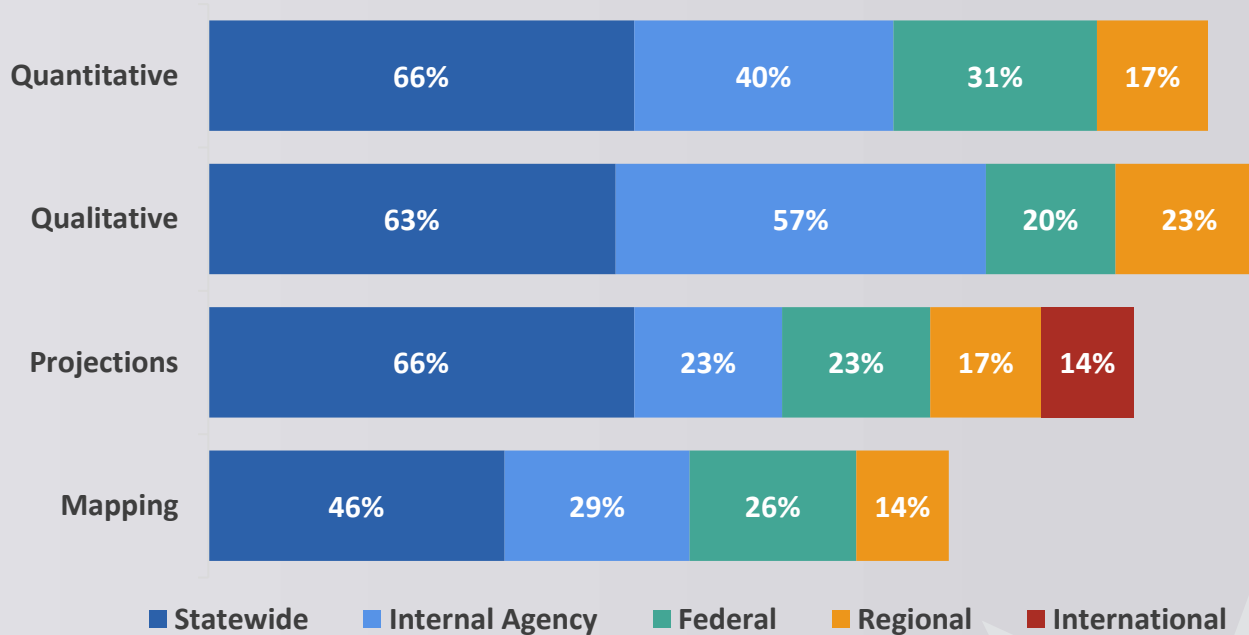
If your agency is planning for risk or resiliency planning, have you developed tools or methods to:

Assess Vulnerability
51%

Prioritize Investment Decisions
34%

Develop Adaptation Strategies
26%

What level of government is the source for each type of data used in planning?



“More communication across the agency. Breaking silos and sharing knowledge and resource methodologies has been imperative for this process.”

DATA SOURCES

Quantitative

- Asset Inventories
- Damage Reports
- Engineering Assessments
- High Level GIS
- Inundation Models
- Flood Depth Grids

Qualitative

- Known/Anecdotal History
- Expert Opinions
- Community Surveys
- After Action Reports
- Infrastructure Surveys
- Road Closure Reporting System
- Bridge Inspection Reports

Projections

- Bridge Management Systems
- Road Inventory Systems
- Pavement Management System
- Travel Forecasts
- Sea Level Rise Projections

National Sources

- Intergovernmental Panel on Climate Change
- National Oceanic and Atmospheric Administration
- National Weather Service
- United States Geological Survey
- Transportation Research Board

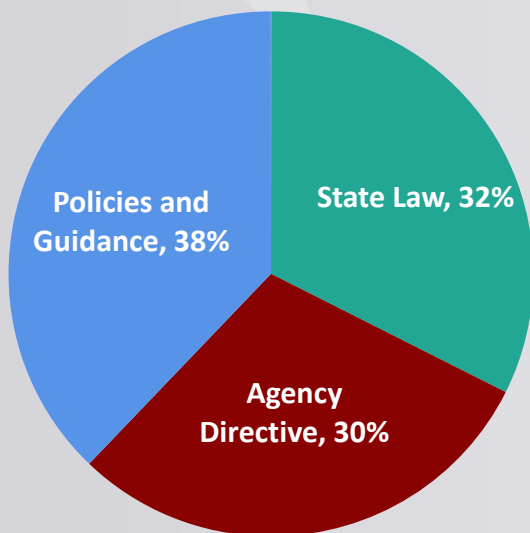
POLICIES, GUIDANCE, AND DECISION-MAKING

What risk or resiliency-related policies or guidance does your agency refer to or rely on for planning purposes?

Local or Regional
20%

State or Federal Guidance
80%

What laws, policies, or guidance addressing risk or resiliency have an impact on planning in your state?



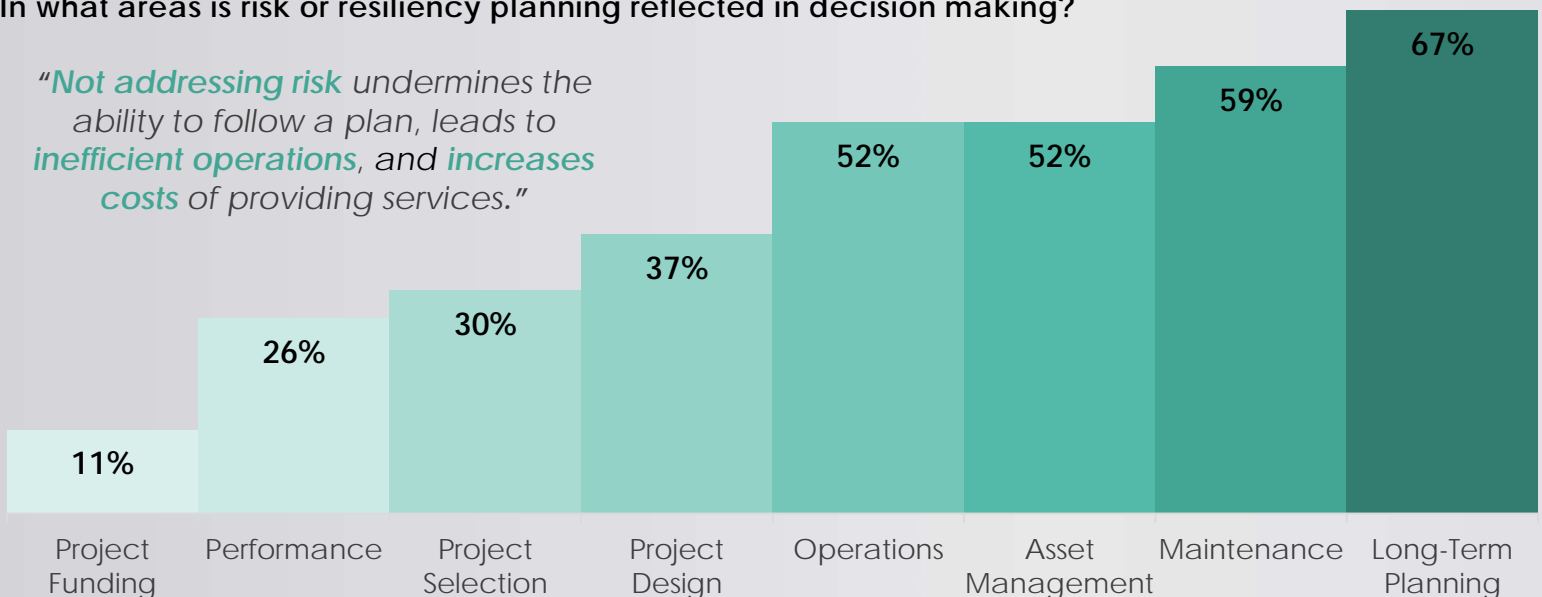
- ✓ State Resiliency Plan
- ✓ Capital project prioritization process assesses resilience to extreme weather events
- ✓ State Commission on Climate Change
- ✓ Community Risk and Resilience Act

- ✓ Agency Strategic Plan
- ✓ Department of Housing Resiliency Office
- ✓ Long Range Transportation Plan
- ✓ Develop Enterprise Risk Management Plan

- ✓ NEPA Guidance
- ✓ FHWA Guidance
- ✓ FAST ACT/MAP 21
- ✓ LRTP/Asset Management Plan

In what areas is risk or resiliency planning reflected in decision making?

“Not addressing risk undermines the ability to follow a plan, leads to inefficient operations, and increases costs of providing services.”





CHALLENGES IN RISK AND RESILIENCY PLANNING

Please describe any unique challenges to risk or resiliency planning and how your agency has addressed those issues.



Data Availability

- “The agency’s **data (asset, boundary, and hydrology) is not at an enterprise level of maturity**. Currently the agency is working towards standardizing datasets so that it can be available agency-wide”
- “**Lack of data** about soil conditions under local roads.”
- “Sea level rise mapping was developed using old data. We hired a university to remap sea level change using **more accurate LIDAR data**.”
- “**Better projections** for future riverine peak flows due to extreme storm events.”



Balancing Needs and Priorities

- “Budgeting and funding resiliency issues among **competing priorities**.”
- “**Population growth** versus **infrastructure needs**.”
- “Despite recent flooding events, it is difficult to **justify the use of resources** on something that may or may not happen.”



Funding Constraints

- “Costs associated with **maintenance** and keeping waterways clear.”
- “The challenge is how to **engage local transportation agencies** when the State DOT is **not offering new money** to perform risk assessments and/or mitigate the risk.”
- “We are often in a position of **reacting to emerging issues** that uncover a broader risk due to the lack of funding, data, and staff resources.”



Stakeholder Collaboration

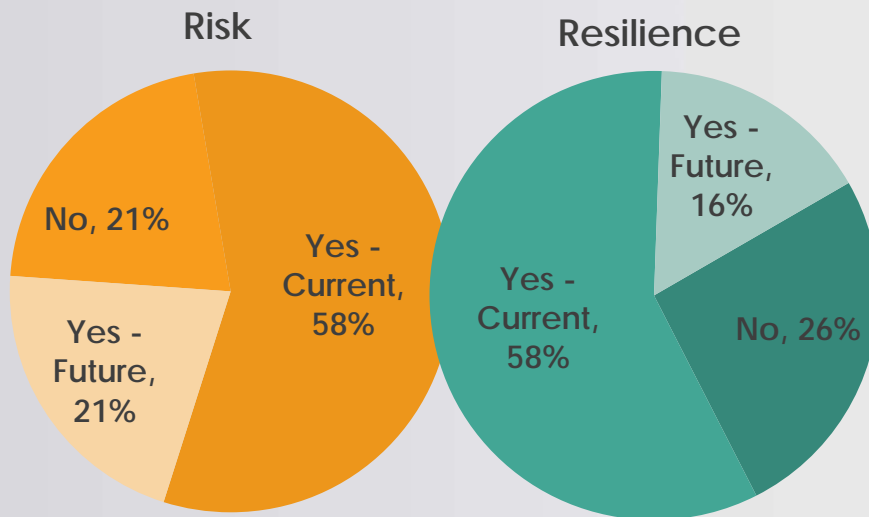
- “**Consistent use** of existing data across state agencies.”
- “**Land use changes outside of our right of way** that negatively impact drainage and water flow patterns exacerbating flooding control events.”
- “**Utilization of cloud storage** should be explored to provide better data sharing opportunities with other agencies.”



Guidance and Training

- “**State level guidance** for data and climate projection selection.”
- “Guidance for **project design** to incorporate future climate change conditions to avoid impacts.”
- “There is a gap in **awareness and education** across the agency. There should be a consistent and continuous process for **workforce development** to institutionalize risk/resiliency planning.”

IS YOUR STATE ACTIVELY ASSESSING CURRENT AND FUTURE RISK OR RESILIENCE ISSUES?



WHAT HAS WORKED?

Within your agency what has been most instrumental in mainstreaming risk or resiliency across departments?



WHAT NEEDS ARE UNMET?

Please describe any known gaps or resources that are needed to address risk or resiliency in planning efforts.

"Internal disconnects exist related to identifying areas subject to flooding and storm water asset management."

"Agency and program level risk evaluation tools and processes."

"Comprehensive risk-based asset management."

"We are currently working on methods and tools to identify vulnerable roads, bridges, and culverts and to develop for use in planning and project prioritization."