

TRANSPORTATION RESEARCH BOARD

Senior Leadership's Role in Embedding Transportation Resilience

May 6, 2021

2:00- 3:30 PM Eastern

@NASEMTRB
#TRBwebinar

PDH Certification Information:

- 1.5 Professional Development Hours (PDH) – see follow-up email for instructions
- You must attend the entire webinar to be eligible to receive PDH credits
- Questions? Contact Reggie Gillum at RGillum@nas.edu

#TRBwebinar

The Transportation Research Board has met the standards and requirements of the Registered Continuing Education Providers Program. Credit earned on completion of this program will be reported to RCEP. A certificate of completion will be issued to participants that have registered and attended the entire session. As such, it does not include content that may be deemed or construed to be an approval or endorsement by RCEP.



REGISTERED CONTINUING EDUCATION PROGRAM

Learning Objectives

1. Apply resilience approaches within their agencies
2. Discuss senior leadership's role in implementing resilience

#TRBwebinar





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Senior Leadership's Role in Embedding Transportation Resilience

Deb Matherly , WSP | Patricia Bye, Consultant | May 6, 2021

Implementing Resilience Throughout an Agency

Deborah Matherly





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What is resilience?

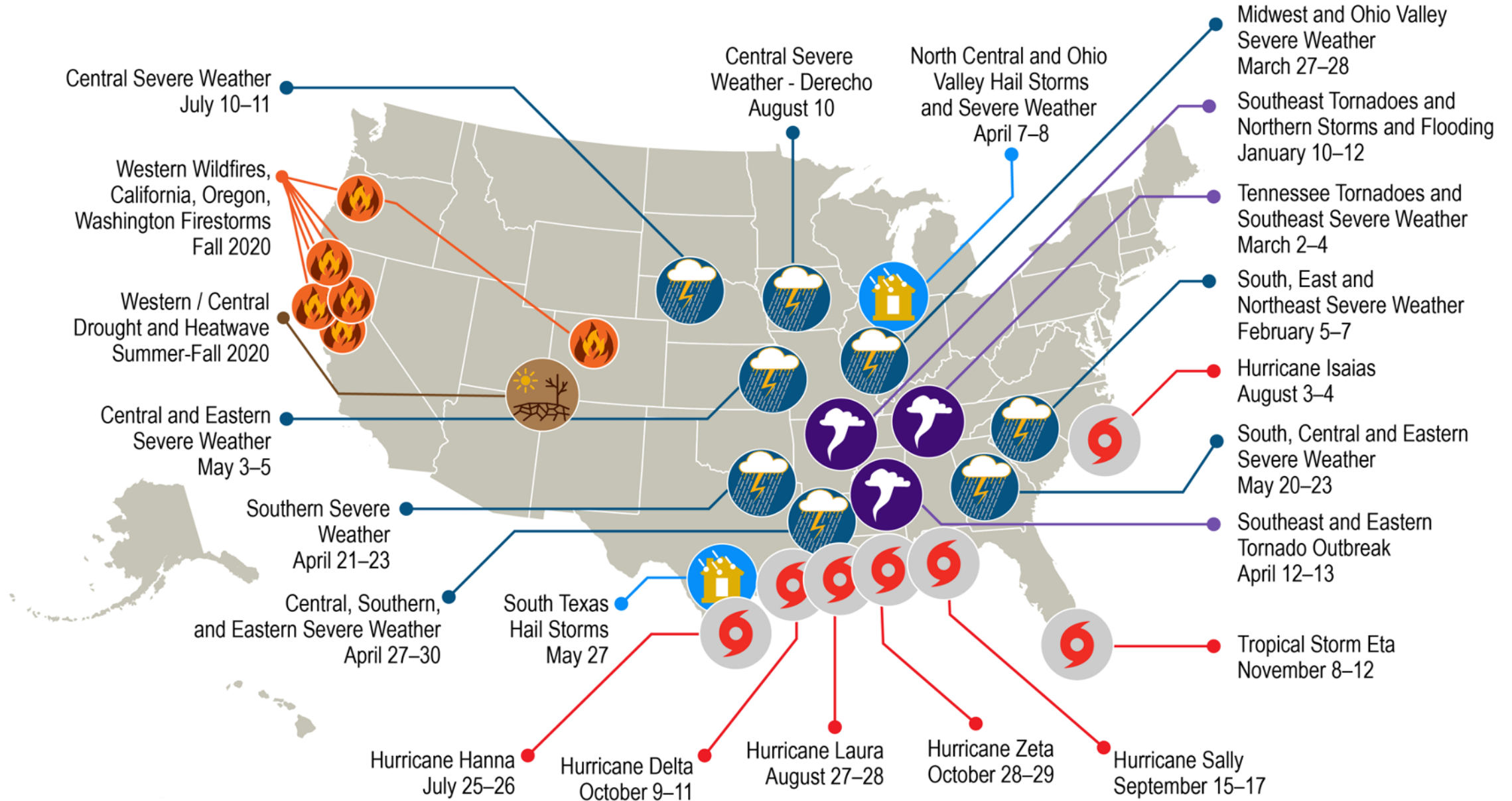
“The ability to prepare and plan for, absorb, recover from, or more successfully adapt to adverse events.”

(Disaster Resilience: A National Imperative, National Research Council, 2012)

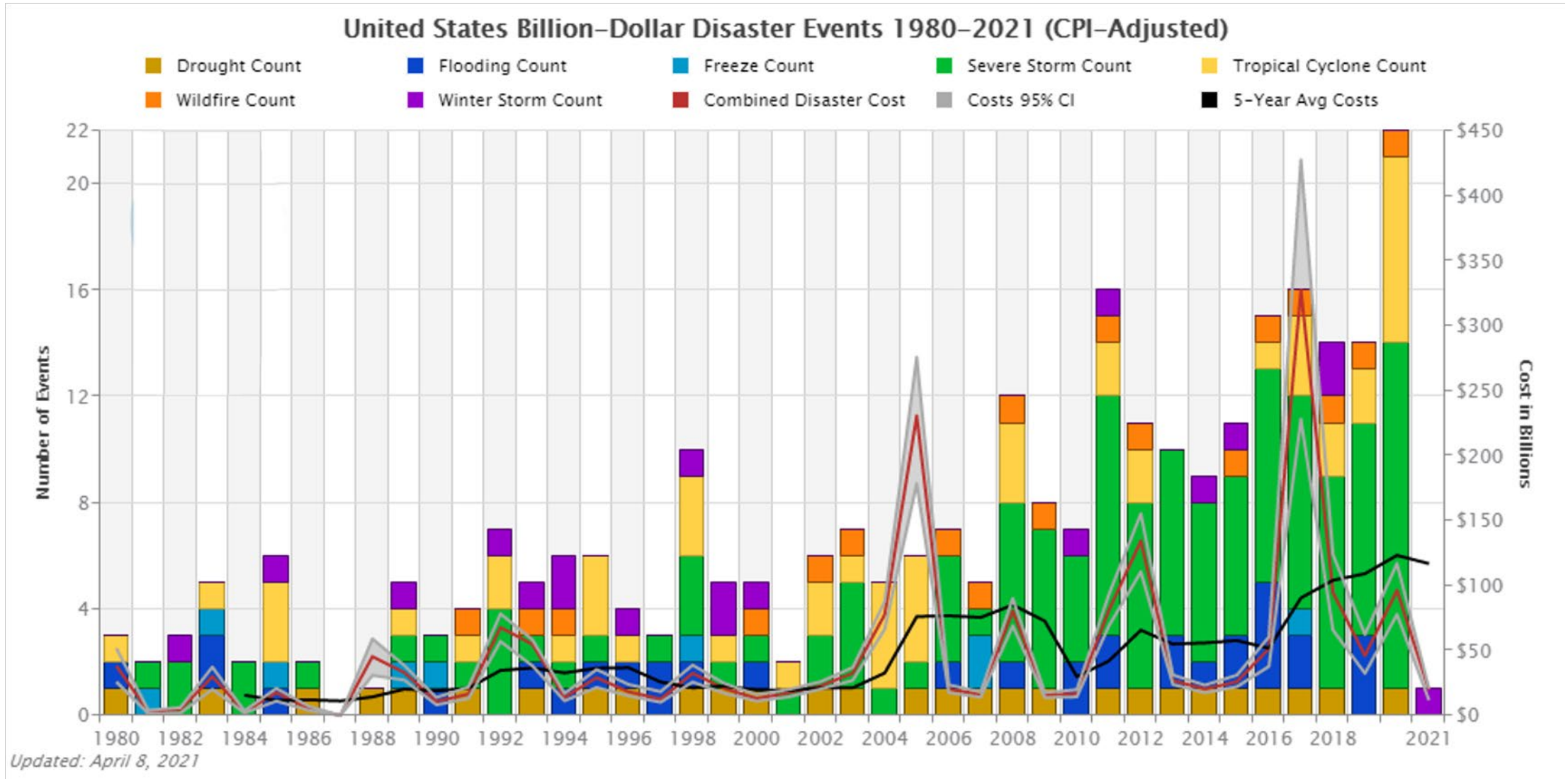
“The capacity of individuals, communities, institutions, businesses and systems within a city to thrive, no matter what kind of chronic stresses and acute shocks they experience.”

(100 Resilient Cities)

U.S. 2020 Billion-Dollar Weather and Climate Disasters



This map denotes the approximate location for each of the 22 separate billion-dollar weather and climate disasters that impacted the United States during 2020.





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Project background

- What You Can Do?
- Key Questions to Ask
- Common Challenges

Objective

- 1) *Primer for CEOs and senior executives on implications and dimensions of resilience and the potential impact on agency programs.*
- 2) *Obtain CEO and senior leadership buy-in & support*

Project Team

CEO Outreach & Primer Team

- Deb Matherly, PI
- Joan McDonald, Co-PI
(former NY Commissioner)
- Pat Bye, Co-PI
- William Ankner, Senior
Advisor (former
Commissioner for RI & LA)
- Jane Mobley

Literature Review and Case Studies Team

- Brian Wolshon, LSU
- John Renne, FAU
- Pam Murray-Tuite,
Clemson U
- Anurag Pande, Cal Poly
- Karl Kim, U. Hawaii
- Eric Yamashita, U. Hawaii

“ We’re good at recovery. Figuring out how to prevent in the first place is the challenge. ”

Why is resilience important?

- *“Whatever you call it, customers expect this work to be done. They expect us to keep things working.”*
- *“A DOT is uniquely positioned to take action, look at design scenarios, and has the opportunity to develop action solutions as an infrastructure agency.”*
- A resilient transportation system improves safety and mobility, saves money and improves the agency’s respect and reputation.

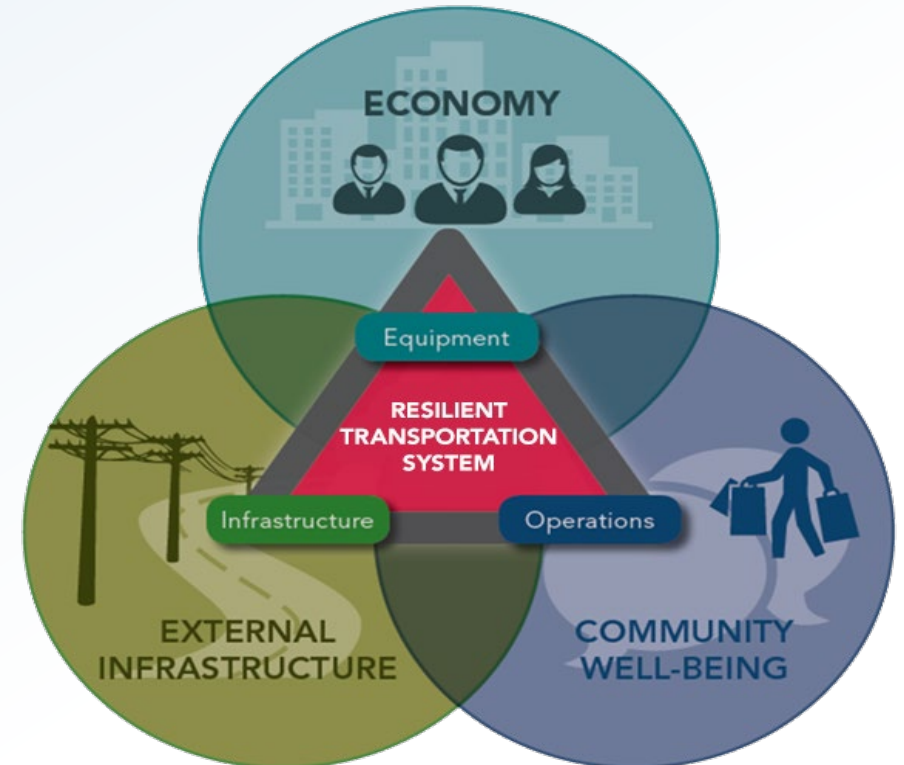
No agency is an island

- Act on critical interdependencies
- Find common causes to pool resources with sister agencies

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*Fish- and wildlife -friendly resilient bridge, Abbot Village, Piscataquis County, Maine.
Source: USDA - Natural Resources Conservation Service, photo Ben Naumann*



Understand risks and hazards

- Apply best risk practices to design standards, materials procurement, cybersecurity, bridge management, and more
- Develop risk tolerance policy for facilities or assets too important to fail
- Identify critical corridors for commerce, emergency lifelines, at-risk communities

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Hurricane Ophelia rains flood Davis community of Carteret County
Source: NOAA/NC Moves 2050 / WSP White Paper



Rock fall programs provide templates for risk-based asset management planning. www.fhwa.dot.gov/asset/pubs/hif13018.pdf

Implement resilience throughout

- Resilience is most effective when “baked in” to everyone’s job and mindset—like safety
- Resilience applies to every major business function
- Support cross-functional collaboration and coordinated decision making

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Resilience graphic from “Improving the Resilience of Transit Systems Threatened by Natural Disasters”, TRB 2017.

Treasure operations and maintenance

- Hands-on understanding is crucial
- Many DOTs include O&M in planning, programming, and design teams
- Oregon DOT uses maintenance dispatch data + weather data to map vulnerable areas
- Alabama DOT purchased equipment that doubles as snow plows



Craven County, NC – Source NCDOT website

Include emergency operations and response

- Train, exercise and learn
- Probe crisis incidents for efficiencies to apply everyday
- Employ everyday practices in emergencies
- Build resilience into recovery plans and use the disaster recovery period to advocate for resilience

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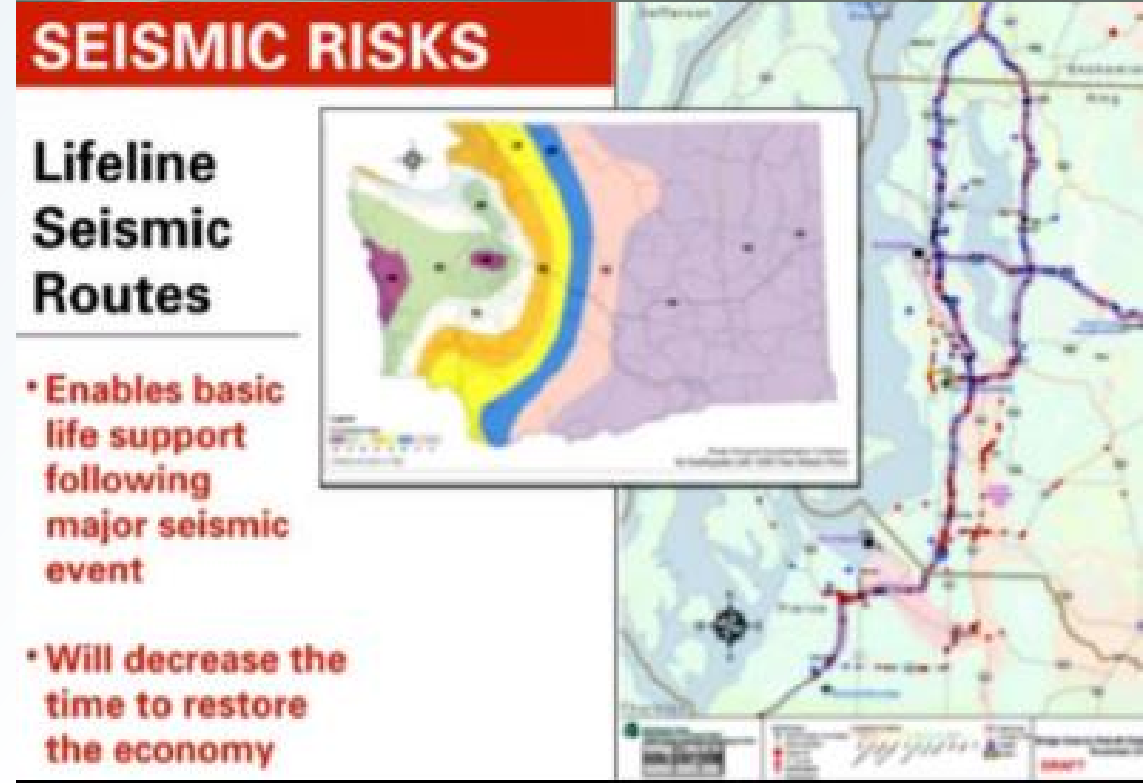
Top: Hurricane Gustav evacuation (with Mayor Nagin). FEMA photo, 2008.
Bottom: Regulatory signage and hurricane evacuation, U.S. Route 290, Texas. Photos by Brian Wolshon.

Incorporate resilience into design and engineering

- Build and prevent scour issues upfront in bridge design
- Design facilities [to seismic standards] to provide transport to key life line facilities in a response situation

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Top: Example Florida hurricane-resistant mast arms installed along coastal areas. Bottom: Lifeline Seismic Routes (WSDOT)
www.fhwa.dot.gov/asset/pubs/hif13017.pdf

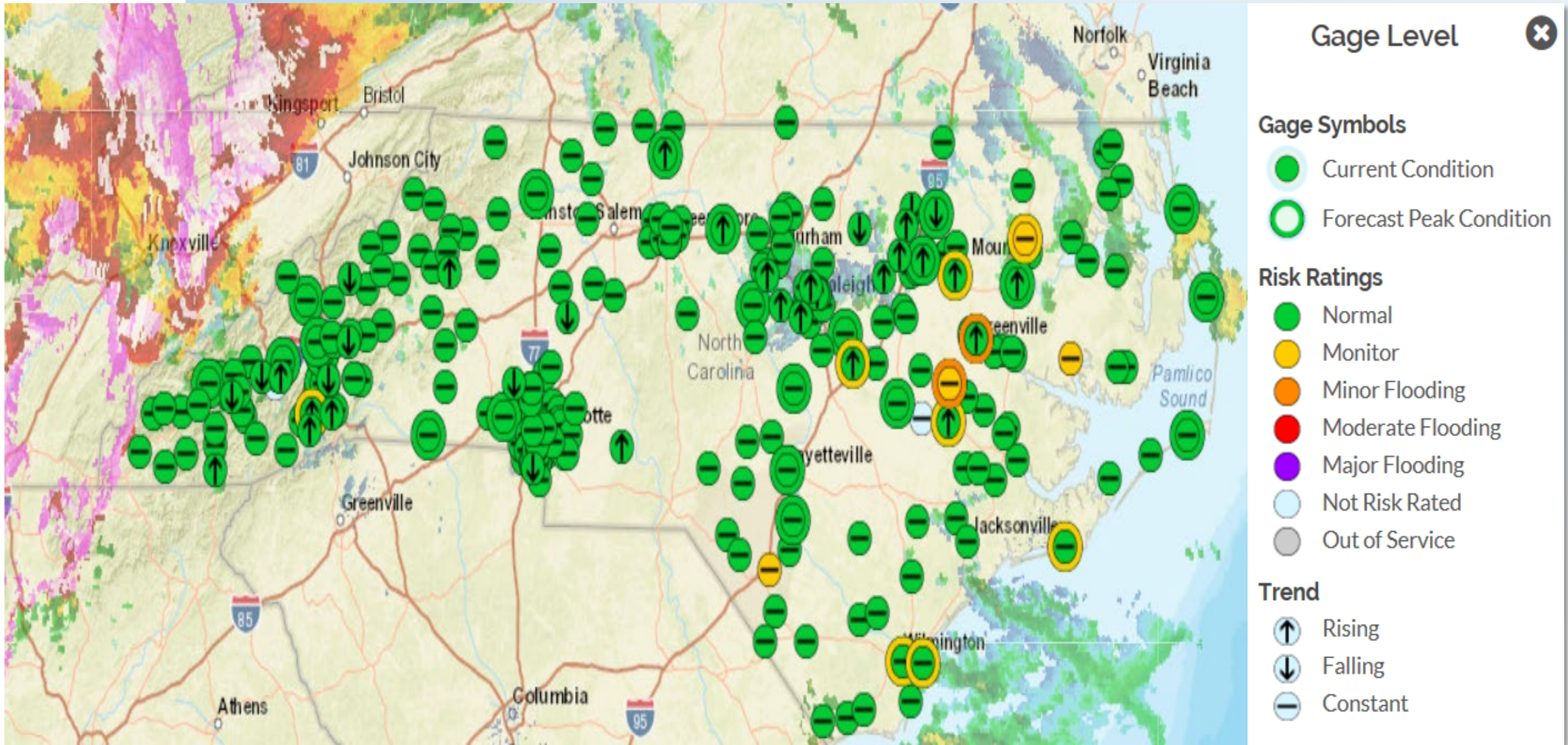


Examine technology and materials through a resilience lens

- Explore innovative techniques and materials
- Use materials that better address current & future conditions
- Automated monitoring systems improve responses, public safety



Cutler Bridge drone inspection image. Courtesy UDOT.



Source: NC Flood Inundation Mapping and Alert Network (FiMAN) From NC Moves 2050 White Paper

How to become more resilient

- Consider long-term life cycle in all sectors
- Embrace innovation in technology, operations, materials, information sharing
- Use risk awareness and criticality to prioritize asset management
- Encourage collaboration across regions and divisions/
cross-functional teams for planning, programming, design

Senior Leadership's Critical Role

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Pat Bye





Photo by Courtney Perry, Minnesota Post

What is Leadership?

An exercise of power?

The possession of extraordinary analytical skill?

Having followers?

The accomplishment of a goal through the direction of human assistants.

W.C.H. Prentice, HBR 1961

Making visions a shared vision

Helping each player understand own part and its relation to the group effort

Giving employees opportunities to learn and grow

Developing team leaders and players

What Does A Leader Do?

Make Sense

**Make
Decisions**

Find Meaning

Communicate

**Make
Accountable**

Learn



Leadership 's critical role in resilience

- Only ones that can provide leadership for resilience

“Resilience needs flexibility in both policy and practice.”

- Only ones that can address full scope

“It’s important to look at the full scope, not piece by piece.”



Make Sense

Understand what
resilience means to
transportation

Understand what
resilience means to an
agency



Make Decisions

Push for resilience focus in existing operations and management structures, processes and activities

Engage actively in resilience work

Assess risks and vulnerabilities

Determine alternate strategies

Prepare build -back strategies and retreat, if necessary, strategies



Find Meaning

Promote the importance of resilience

Have a clear story of what resilience means to state and to agency



Communicate

Capitalize on resilience theme in agency communications

Tell "how this affects me/us" to agency employees and to those outside agency – state government, public and press

3 Basic Messages to Communicate

What transportation system provides, how it functions and what is being done to maintain it

How agency is working to reduce disruptions and improve safety

The agency commitment to resilience

identification audit report
analysis examine survey
method goal
Assessment
system process plan
fact evaluation quality
procedure result
monitor measure
performance quantity
review control investigate

Make Accountable

Integrate performance measures tied to resilience into strategic, capital and operations planning

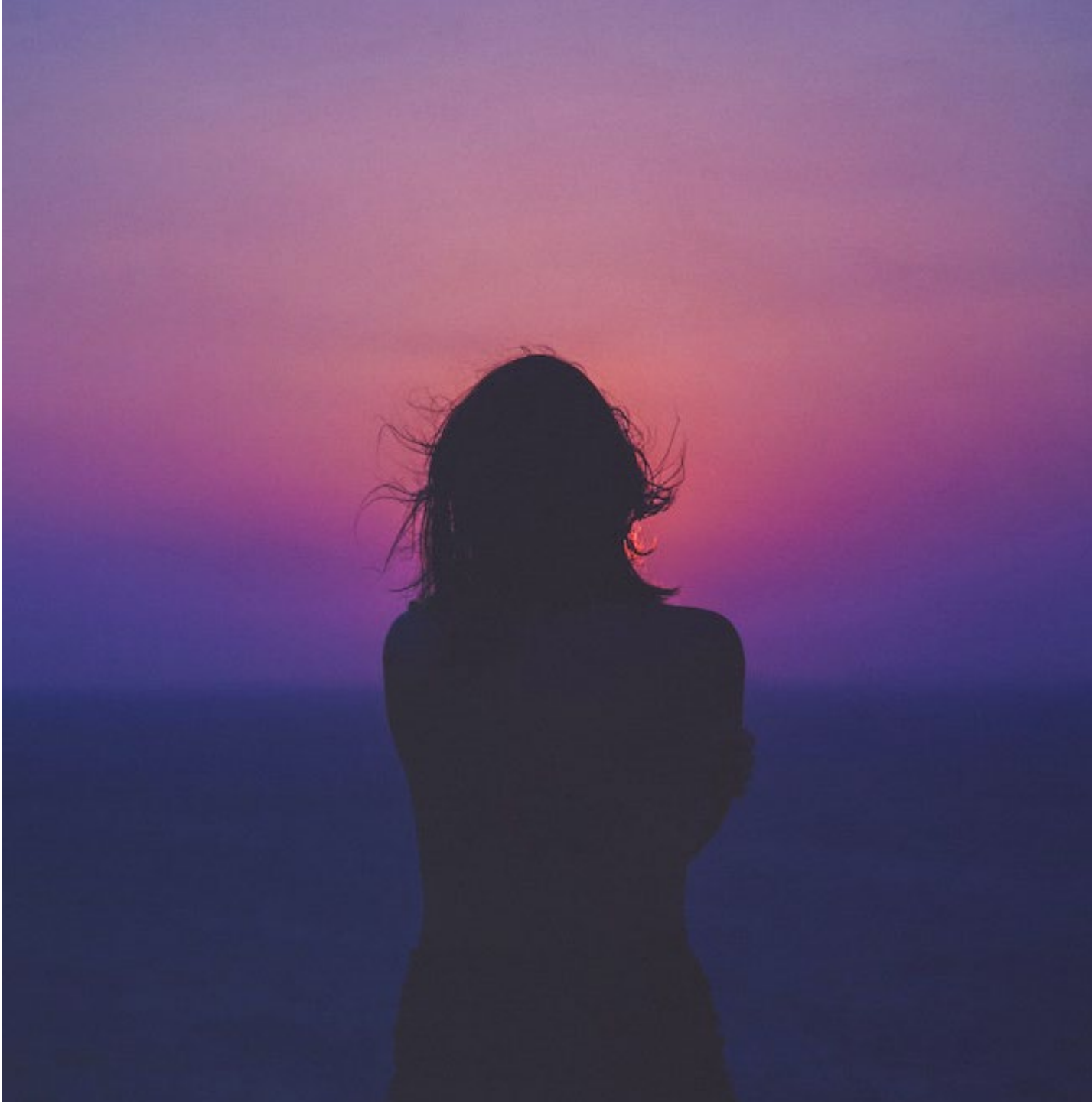
Make resilience part of funding criteria

Learn

- Examine efficiencies that made agency nimble during emergencies and explore what can be done to integrate that into day-to-day operations
- Use continuous learning and improvement processes

“If a DOT can move quickly and nimbly after an event, we must figure out how to do the same on a daily basis.”

“If you had asked, how long it would take prior to the pandemic, most would say a year maybe. Now it was done have done in a week.”



You are not alone

Seek partners

- Within your agency
- In other states
- In local governments
- In private and non-profit organizations



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To be a resilient CEO/Senior Manager

- **Know** risks, hazards and time horizons
 - **Plan** proactively for “what if” scenarios
 - **Balance** risk and costs in capital decisions
 - **Maintain** an owner mentality
- Recognize that small changes have big results over time

Key Questions to Ask

- What are the most likely things that could happen and what impacts will there be?
- Is our planning proactive including using “what if” scenarios for new threats and realities?
- What are alternative approaches for adapting infrastructure and operations?
- Do we have resilience measures in our strategic, operations and capital planning?



Key Take -Aways

- Many resilience practices represent minor adaptations to existing processes, not big changes (though some will require significant investments)
- Resilience is most effective when woven into the fabric of the organization—internal and external
- CEOs that make resilience a priority may be saving their own jobs, as well as helping their agency, their state and their communities

How You Can Help

- Become a resilience champion
- Identify opportunities to encourage use of Resilience Primer
- Make resilience part of discussions among ourselves and
 - with transportation colleagues
 - with people who influence and make decisions about transportation in our region and nationally
 - with the public

Thank You

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HI RESILIENCE HIGHLIGHTS

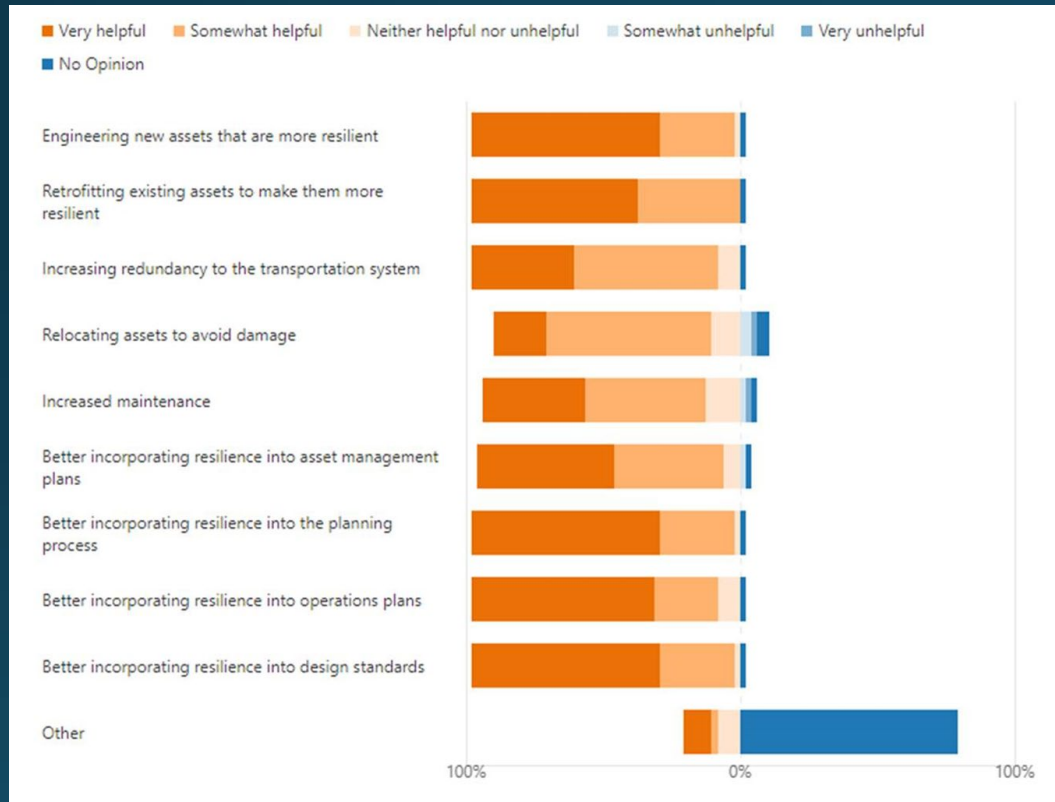
TRB Webinar: Embedding Transportation Resilience into DOTs



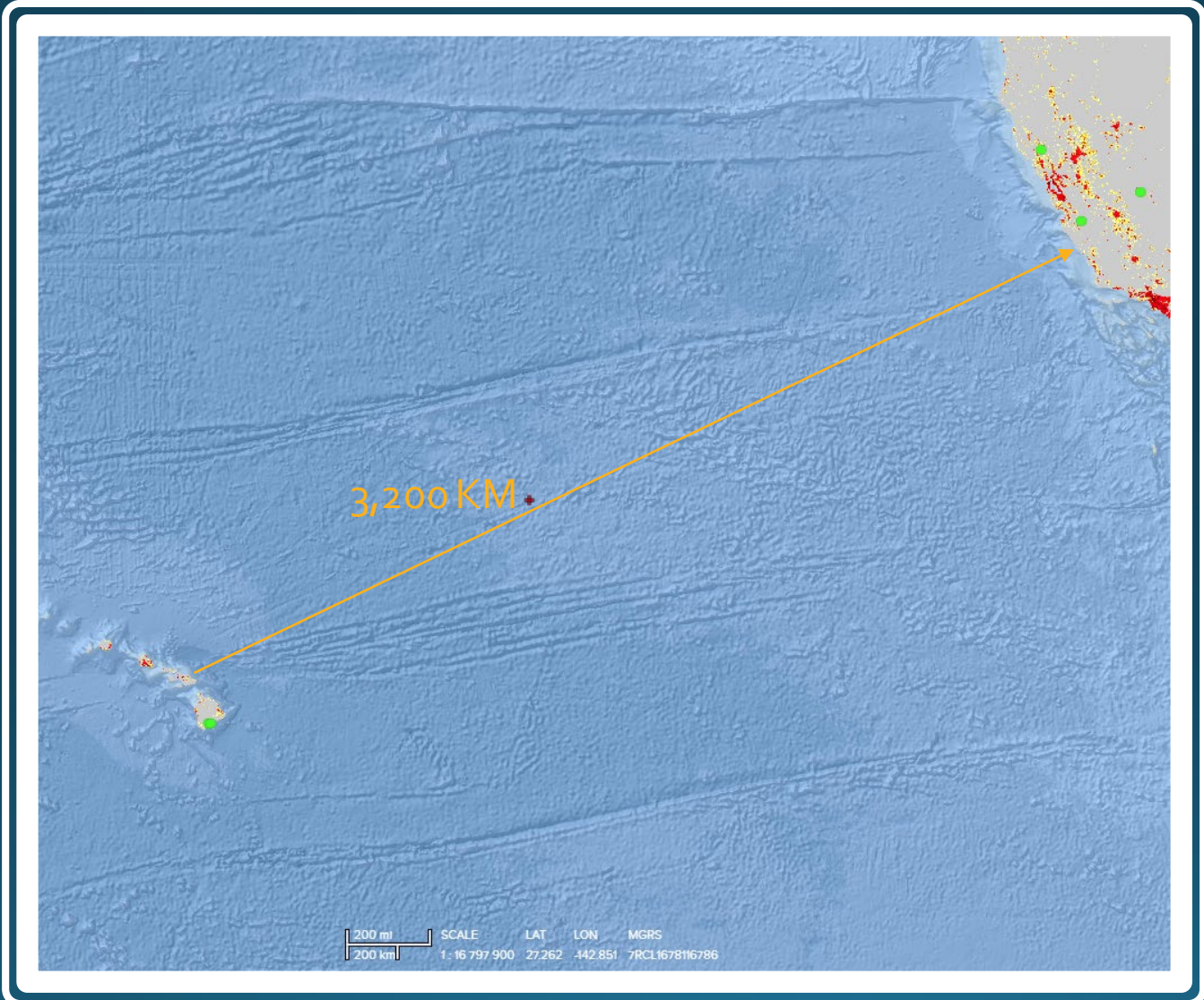
AASHTO Resilience Activities

- Center Website Portal:
 - Links to available climate tools for state partners.
 - Resilience “portal”: design tools, data, analytics and data best practices.
 - Risk analysis frameworks.
- Resilience Webinar Series: Presents material on key issues including:
 - Managed retreat;
 - Workforce development and training needs for emerging engineers.
- Peer Exchanges: Organize and hold a series of regional peer exchanges to focus on regional approaches to address resilience.

CTSSR Member Survey



- Survey sent January 2021.
- Looked at member perception of strategies transportation departments are considering to improve resilience of their systems.



Considerations for CEOs

- Balance today's needs with future
- Make tomorrow's problems relevant today
- Set plans and processes to default to action
- Be part of the solution



Short Term Resilience

- Emergency Repairs
- Coastal Highway Protection Sites
- Slope Failure Warnings



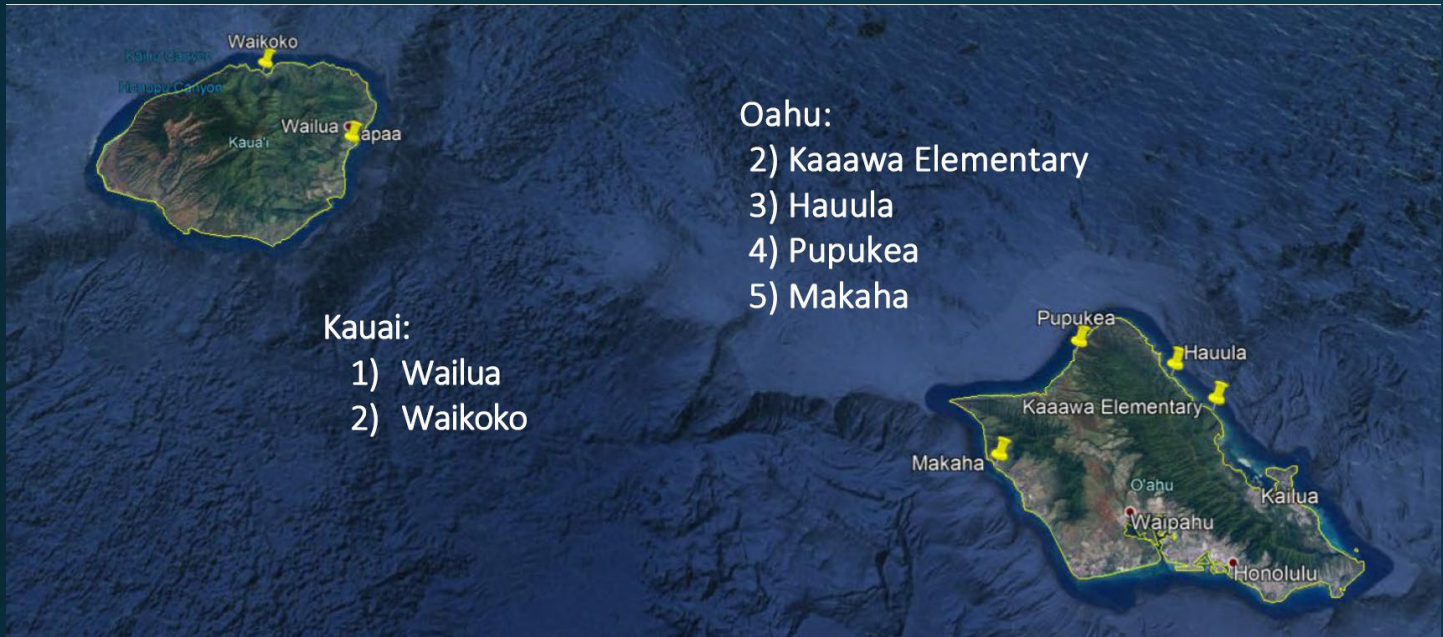
Slope Failure Warning



- Kuhio Highway at Hanalei Hill. Using GPS to alert responders if there is movement of the slope above the highway.
- Allows for advance warning.
- Looking into using this for areas where surficial failures may impact highways as well.

Mid Term Resilience

- Beach replenishment
- Small realignments
- Policy adjustments for facilities preservation in SLR forecasted areas



Sandsaver Pilot

- Pilot project to evaluate effectiveness of “sandsavers” for reduction of erosion rate and shoreline stabilization
- Pilot will deploy perforated coastal structures at five locations and will include field monitoring to determine effectiveness
- Cost est. \$8.5 million



Small Realignmentments



- Consideration of small realignmentments in coastal areas (Laniakea, Mopua)
- Provides additional time to plan and coordinate while moving the threatened segment
- Cost comparison
 - \$6-8 million small realignment
 - \$65 million major realignment

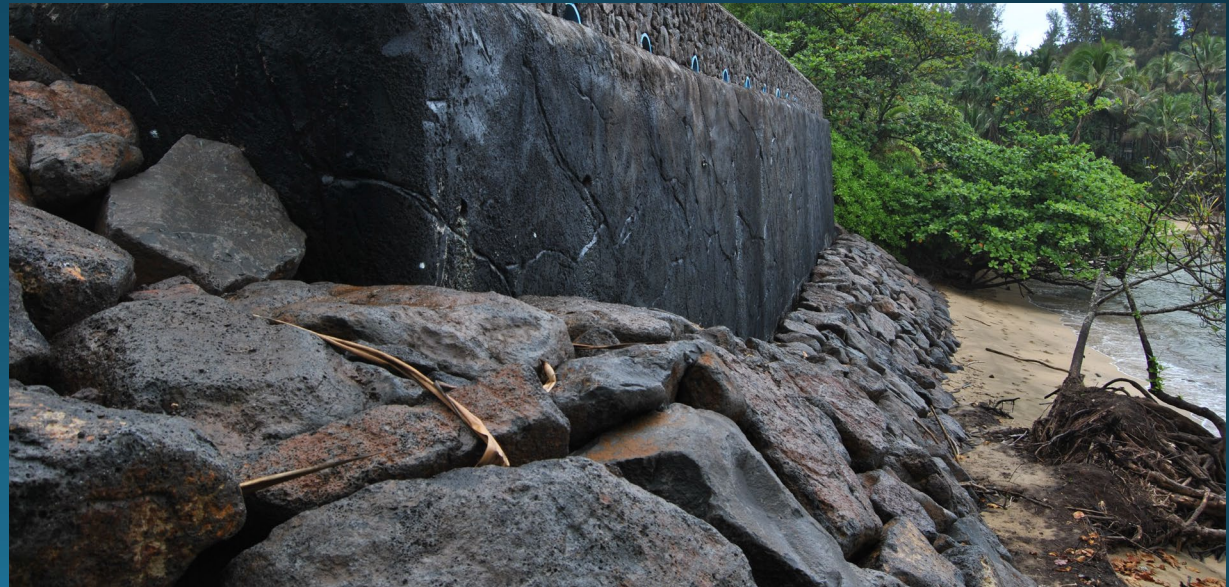
Policy for Facilities in SLR areas

- Consideration of use of less costly, more immediate fixes for facilities in areas forecasted to be impacted by SLR.
- Example:
 - Top – Makaha Bridge 3A
 - Bottom – Wainiha Bridge

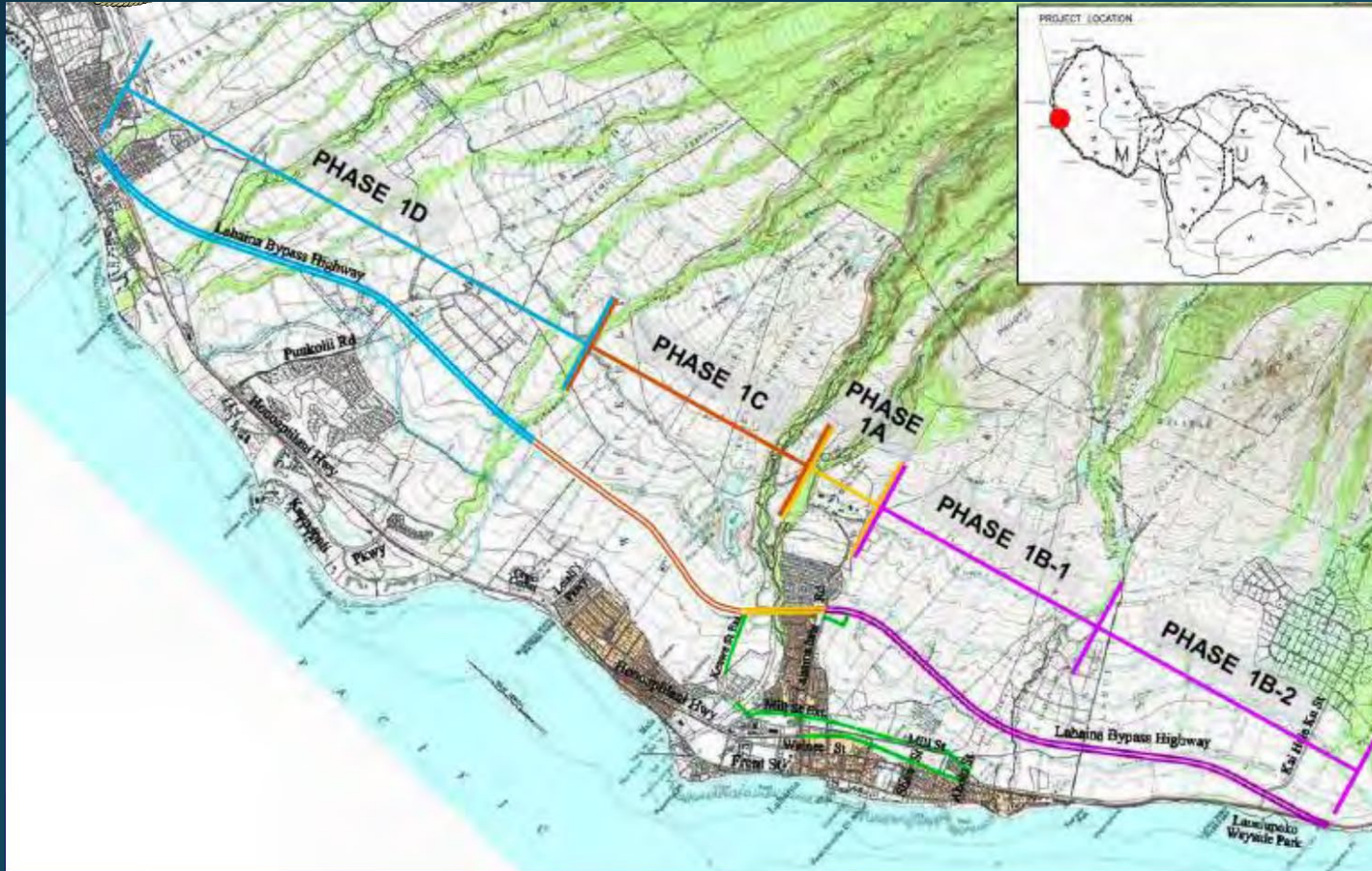


Long Term Resilience

- Climate Adaptation Action Plan – gathering working groups (CZM, planning, land use agencies) to address concerns before planning process starts
- Considerations
 - Plan for 30 years out
 - No blanket policy
 - Adaptation design making process
 - Risk based scenario



Realignment/Managed Retreat







MAHALO

Ed Sniffen

Deputy Director for Highways

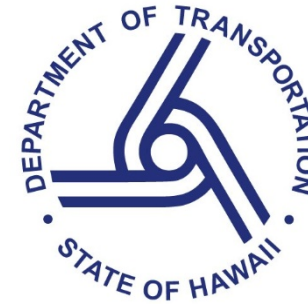
Hawaii Department of Transportation

<http://hidot.hawaii.gov>





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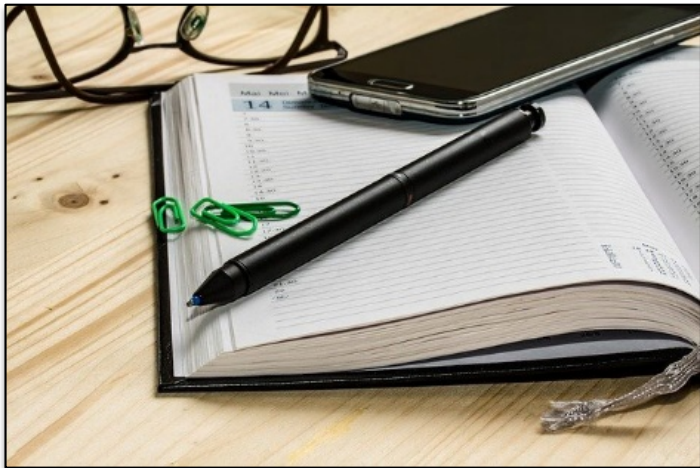
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- Networking opportunities
- May provide a path to Standing Committee membership

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Other TRB events for you

- *May 12: Senior Leadership's Role in Embedding Transportation Resilience*
- *May 24: Geotechnical Responses to Extreme Events*

<https://www.nationalacademies.org/trb/events>