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# Investing in Transportation Resilience: A Framework for Informed Choices

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XVI WORLD WINTER SERVICE AND ROAD RESILIENCE CONGRESS  
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XVI CONGRESO MUNDIAL DE VIALIDAD INVERNAL Y RESILIENCIA DE LA CARRETERA



# Our Study

**Motivation**: Response to congressional mandate to USDOT

**Task**: Identify metrics to assess the resilience of existing transportation infrastructure and inform investment planning to increase the resilience of transportation system assets and their critical functions following a wide array of natural hazards.

**Implementation**: 12-member expert committee through the Transportation Research Board Consensus Study group.

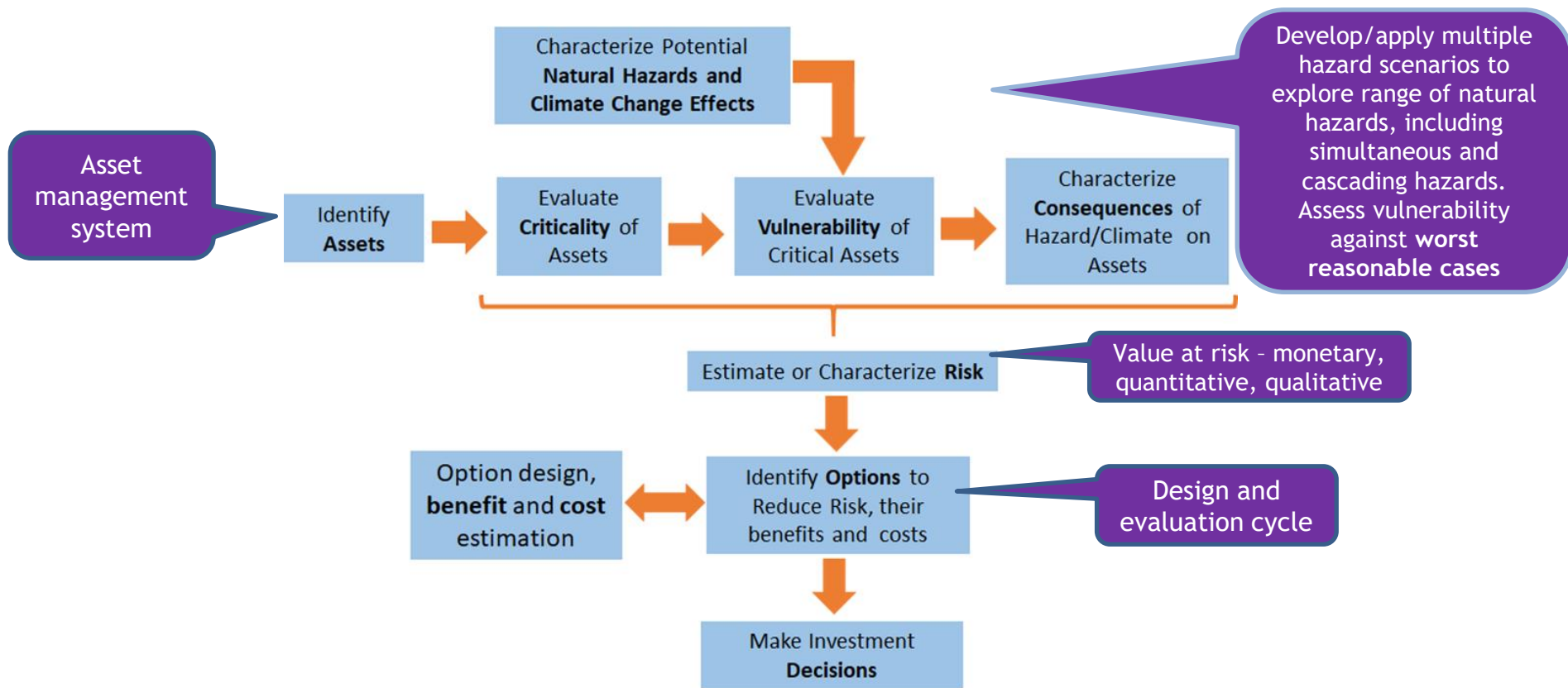
# Committee's Observations

- Research literature
  - strong theoretical base largely focused on models and measures of recovery from disasters.
- The practice
  - Much progress focused on supporting management and investment decisions to increase asset resilience, including concepts and measures of vulnerability and criticality.
- Committee determination
  - A single resilience metric is unlikely to be found.
    - Transportation systems comprise a broad range of infrastructure types, scales, ownership and management patterns;
    - Resilience to natural disasters is determined by complex interaction of infrastructure characteristics, response processes, resources and people; by the wide range of natural hazards encountered, the varied demands for transportation services, and by contextual demographic and environmental conditions.

# Committee's Conclusions

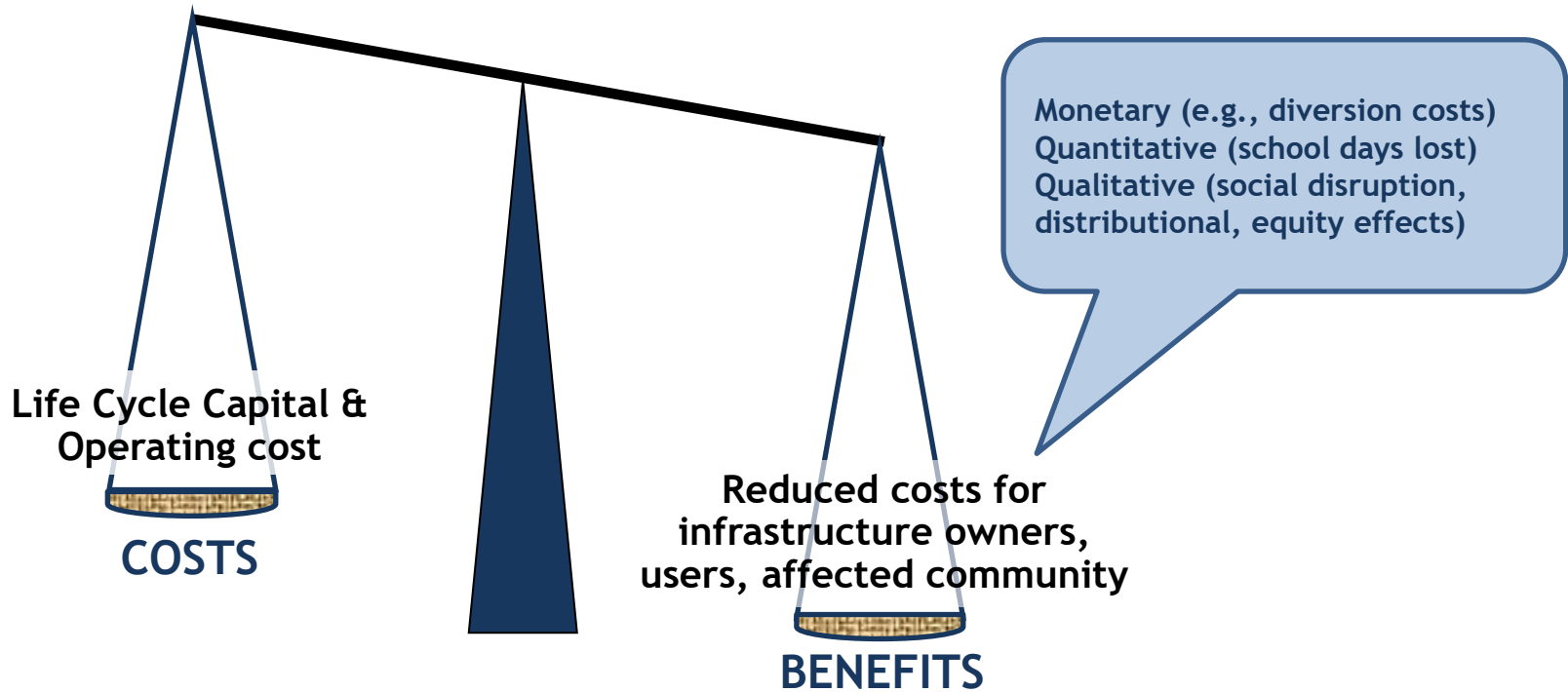
- For decision-support analysis, there is a need for a collection of metrics, and
- Analyses using appropriate metrics within a strong decision support framework can help make the case for investments in resilience.

The principal product of this report is a framework for assessing benefits of resilience investments in a logical and consistent manner so they can be weighed against the financial outlays and other costs likely to be incurred to achieve them.



# BCA Evaluation Framework

Explicit identification, comparison of benefits, costs



# Recommendations to Congress and USDOT

1. Consider requirement of resilience assessments for all projects that involve long-lived assets and that are candidates for federal funding.
2. Promote the use of benefit-cost analysis (BCA) for project justifications taking into account the resilience benefits estimated using the multi-step analytic framework.
3. Provide guidance to the USDOT modal administrations on the development of analytic methods and tools.
4. Direct and resource a study on how to obtain and keep updated the natural hazards data necessary for resilience analysis in accordance with the framework
5. Coordinate with the modal agencies on the design and conduct of structured pilots for estimating resilience benefits according to the multistep analytic framework

# Committee of 12 Experts

- **Joseph Schofer**, *Northwestern University*
- **Paolo Bocchini**, *Lehigh University*
- **Henry Burton**, *University of California*
- **Susanne DesRoches**, *New York City Mayor's Office*
- **Alexander Heil**, *Citizens Budget Commission*
- **Geraldine Knatz (NAE)**, *University of Southern California*
- **Elise Miller-Hooks**, *George Mason University*
- **RADM Ann Phillips**, (U.S. Navy, retired), *Office of the Governor, Commonwealth of Virginia*
- **José Ramírez Márquez**, *Stevens Institute of Technology*
- **Victor Rivas**, *Jacobs Engineering Inc.*
- **John (“Jack”) Wells**, *Retired Transportation Economist*
- **Shawn Wilson**, *Louisiana Department of Transportation and Development*

