REPORTS FROM BREAKOUT GROUPS: KEY THEMES AND LESSONS-LEARNED

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Group A

Integrating resilience into established agency processes such as asset management

Shawn Wilson

Integrating resilience into established agency processes such as asset management

- Does your organization integrate resilience into infrastructure planning and investments?

  - In **Louisiana**, we could do more in the planning process. Over the last three years, where were the missed opportunities?
  - **Colorado** has a resiliency appendix as part of the Long Range Plan
  - **Michigan** flood risk tool has a risk score incorporated
  - In **Minnesota**, it is part of the 20 year plan, one of the six tenants.

Integrating resilience into established agency processes such as asset management

- Most conversations are at the project level, we need think about the **system level.**
- In **Minnesota**, it is part of the 20 year plan, one of the six tenants.
- Authoritative data sets are needed to convince policy makers
- Need to **standardize** vulnerability assessments
- In CO, we don't have FEMA hydraulic flow maps for half the state hard to do the flooding analysis (Louisiana will give you some)

Are there any technical/regulatory/institutional barriers to integrating specific elements of resilience?

- Railroads use the **“emergency docket”** in emergencies, such as during COVID for operation adjustments
- **Funding silos** present barriers, with different requirements
- **Outside the ROW** requires collaboration with a different agency

Are there any technical/regulatory/institutional barriers to integrating specific elements of resilience?

- Hard to get staff to **do things differently**
- Performance measures are needed—what do they look like?
- How do we **educate the engineering work force** for the future?

Are there any technical/regulatory/institutional barriers to integrating specific elements of resilience?

- **Crowdsourcing data** could play a role in planning
- Learning to use GPS data to find the hot spots
- AIS navigation systems provide **real time vessel movements**
- But how does it help with dredging (USACE)

Are there any technical/regulatory/institutional barriers to integrating specific elements of resilience?

- **Human resources**, how to manage and educate staff
- Consultants play a useful role but it takes time to bring on board
- Build capability in-house or hire consultants?

- **Communicating to the general public** about what resilience means?
  - Explaining benefits and costs (good for legislators)
  - Telling stories on impacting people's lives
  - Inundation maps create public reactions

Group B

Securing natural hazards data from multiple sources

Elise Miller-Hooks

Securing natural hazards data from multiple sources

What kinds of data have been most difficult to acquire?

- Trend and predictive climate data and analysis for design and operations
- Generation, application and access of data, is it interoperable, comparable and scalable (standardized) – for a grantee and grantor
- Resolution and suitability for specific applications
- Qualitative data needs - better guidance

What specific data limitations have you encountered with securing current and predicted natural hazards data? Coverage? Granularity? Timeliness?

- Advanced data sets are more complex than the current models – private companies have the capacity to support public sector needs (Cloud)
- Lack of standards/guidance/recommendations on the types of data needed and how it gets used
- Datasets are widely used and available, the underlying data needs to be updateable and current. (Atlis-14 data is from 2006 yet data collections are needed for today for planning and design)

Securing natural hazards data from multiple sources

To what extent have you been able to rely on data from your own or sister agencies in your state or region?

- There is a reliance on prices and costs but the benefits are less trusted since they are more difficult to quantify
- Policies of different agencies can influence the types of data and the use of the data – an issue seen today when consider disadvantaged communities and their impacts to climate change

What key changes in data types and availability are in progress that will help non-federal agencies in resilience planning?

- Guidance on the BCA offered by USDOT
- Determination on how equity (socioeconomic) and economic impact is handled in resilience assessment for investments
- Regions are organized differently – this affects the ability to standardized – MPOs or COGs could be a clearing house

Securing natural hazards data from multiple sources

To what extend are provider agencies able to offer hands-on support to non-federal implementing agencies?

- Grants
- Gages and sensors and other equipment – guidance for maintaining it
- Standardization of the data and parameters for the data or some sort of data repository/clearing house
- More Case-studies or synthesis on climate data
- Incentives for public and private collaboration

How are the uncertainties associated with climate change being address by both users and providers?

- Predictions using older data and models for forecasting the future

Group C

Tools, models, and best practices for resilience planning and evaluation

Paolo Bocchini

Tools, models, and best practices for resilience planning and evaluation

--Mixed use of probabilistic analysis and Monte Carlo simulation

--Deterministic analysis (scenario-based) is more common (if “x” is shutdown, the following will happen in terms of traffic)

--RAPTA (FEMA) [Resilience Analysis and Planning Tool] (candidate tool)

--Go Consequences, LifeSim

--Hazus (FEMA)—minimal use

--Hecras, SMS, SRH2D (hydraulic, H&H analysis)

--VAST(FHWA)/Climate Change Viewer

--FEMA flood maps (starting point for refinement)

Tools, models, and best practices for resilience planning and evaluation

- Are you developing and deploying tools with your own staff or with consultants or both?
- Consultants have major role in tool development, some development by DOT staff (but staff shortages problematic), university partners
- State DOT engineers trained to use tools
- Airports also rely on consultants
- DOT depends on consultants, VOLPE, National Labs

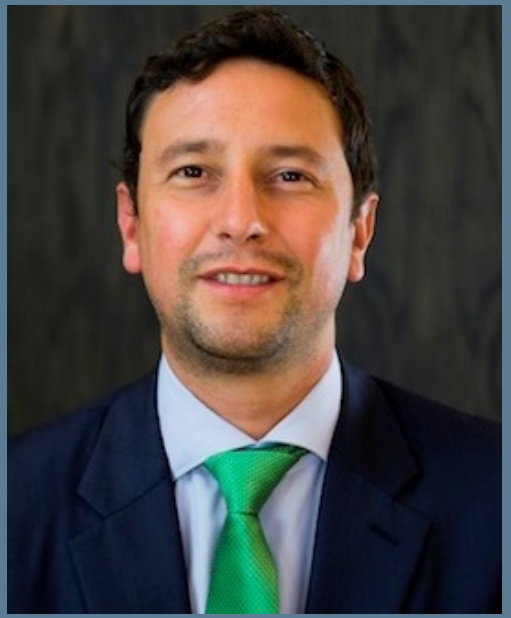
Tools, models, and best practices for resilience planning and evaluation

How well are the tools working? Where do you see improvements needed?

- Main gaps: consequence tools (economics, equity impacts)(e.g., evacuation)
- Should we package tools by region?
- Data access is challenging for assessing impacts

Group D

Decision Strategies: evaluating the benefits of resilience investments



Jose Ramirez-Marquez

Decision Strategies: evaluating the benefits of resilience investments

- BCAs are just a tool, they can't account for everything or replace fundamentally political decisions.
- Some projects will never pencil out through a BCA but are still worthy for equity reasons etc. or because the data doesn't exist to fully quantify their impacts.
- BCAs require moral/ethical determinations. It matters "who benefits" and what you count as "value."
- They can be manipulated and their quality varies significantly, but the exercise itself has value in imposing rigor on the process.

Decision Strategies: evaluating the benefits of resilience investments

- System thinking is critical for resiliency. Spillover effects and ripples quickly cross institutional barriers and well laid plans with one administrative unit can be disrupted by lack of preparation from others.
- It's important to think about long term sustainability of projects once the disaster is over—there will always be a redundancy bias in policymaking. You need continuity of funding and management. You need a long term and iterative approach.

Decision Strategies: evaluating the benefits of resilience investments

- Communicating infrastructure risk and needs with policymakers and the public is essential, but challenging and expensive. It can be hard to generate interest, especially for events that are projected but not actively happening.