NATIONAL SYMPOSIUM: IMPACTS OF EXTREME WEATHER ON TRANSPORTATION

Synthesis of Overarching Themes, Best Practices, and Lessons Learned
Extreme Weather

Not only are certain types of extreme weather getting worse, but public expectations of DOT response have greatly increased.

Examples of extreme weather:
- Alabama experiences wet and dry cycles that trigger landslides and sinkholes
- Longest flood in U.S. history experienced in Iowa
- Seasonal timing of lake-effect snow in Michigan is getting harder to predict
- Frequency and magnitude of flooding has changed in western Washington
Overarching Themes

- State DOTs handle a diversity of extreme weather events, from 8-hour dust storms to blizzards in April.
- However, there are strong similarities between many of the emerging best practices and data needs for all extreme weather types.
- The community of practice present at this symposium represents a wealth of knowledge on how to handle these events — there is a tremendous need to share experiences.
“Wish List” for Increasing Resilience to Extreme Weather

- Weather forecast needs (across all types of extreme weather)
  - Real-time data on actual weather conditions during an event.
  - Ability to translate weather forecasts into metrics that matter to specific types of transportation decision making.
  - Information on the reliability of weather forecasts.
  - Weather forecasts that match the timing of our budget cycles.

- Institutional understanding within state DOTs
  - To what extent can we use known threshold points (e.g., 3 inches of snow/hour) to make management decisions?
  - What level of risk is acceptable to us?
Best Practices: Communication and Outreach

- Use many communication channels to provide real-time information (Twitter, calls, texting, traditional media outlets, etc)
- Build relationships with stakeholders (e.g., commercial carrier services) ahead of time
- Methods of ensuring interoperability can save time and resources
Lessons Learned: Operations and Maintenance

- Designing a transportation system to cover all extreme events at every location is impractical and very expensive — emergency response and maintenance can be a more efficient option.

- Performance metrics (such as user delay costs) can provide helpful ways of measuring efficiency and effectiveness of O&M tactics.

- Technologies are rapidly emerging to collect real-time information on road weather conditions (e.g., using data collected by vehicles).
Lessons Learned: Design

- Context-sensitive design changes may be warranted in critical and vulnerable areas.
- Need to increase awareness in your organization regarding extreme weather planning and design across functional areas (e.g., VTrans/ANR river channelization)
  - Training
  - Updated data and models reflecting recent trends
- Partnerships with information providers to understand what data exists and associated uncertainties
- Regulatory partners are important
- Guidance manuals must reflect flexibility and may be used to justify augmentation to standard design approaches
Lessons Learned: Vulnerability Assessment and Asset Management

- Asset management systems and spatial data on asset locations enable effective vulnerability assessments.
- Drawing on the institutional knowledge of maintenance staff and working with locals to understand vulnerability is key.
Let’s learn from past experiences through post-event “de-briefs” and events such as this one.

This field is rapidly evolving; it is critical for state DOTs to share best practices with each other.