

# AASHTO 2015 EXTREME WEATHER SESSIONS

AASHTO'S SPECIAL COMMITTEE ON TRANSPORTATION SECURITY AND EMERGENCY  
MANAGEMENT (SCOTSEM), ANNUAL MEETING

## EXTREME WEATHER EVENTS: TRENDS AND IMPLICATIONS FOR EMERGENCY MANAGEMENT

AUGUST 13, 2015  
2:00-3:00 PM  
BERKELEY, CALIFORNIA

### PRESENTATION SUMMARY

On behalf of the AASHTO Center for Environmental Excellence, Mike Savonis of ICF International presented to SCOTSEM on trends in extreme weather events and implications for emergency management. Attendance at the session included representatives from state DOTs, along with individuals from FHWA.

Extreme weather events are occurring across the country and are happening more frequently. In recent years, states have been experiencing severe transportation impacts from events such as flooding, high temperatures, snowstorms, landslides, drought, wildfires, and permafrost thaw. Extreme weather is also getting costlier. Costs from extreme events are trending upward over time, in part due to increasing development in riskier areas.

The United States has been observing changes in extreme weather in the recent past. Average temperatures from 1991-2012 have increased by 1.5°F and higher in the United States compared to the 1901-1960 average. The length of the frost-free season has been increasing nationally since the 1980s, with the largest increases occurring in the western United States. Observed precipitation change varies by region; in general, dry areas are getting drier and wet areas are getting wetter. More precipitation is coming down in extreme events, particularly in the Northeast. For example, several states have experienced heavy snow events in the recent past although the length of the frost-free season has been decreasing.

These trends in extreme events are projected to continue and accelerate. The United States is projected to experience an increase in average and extreme temperatures, heat wave intensity, number of frost-free days, precipitation variability, drought intensity in the Southwest, and hurricane intensity and rainfall.

Increasing resilience of our transportation networks in light of these trends will involve all areas of transportation departments, including infrastructure siting and design, materials, maintenance, operations, planning, policy, and emergency management.

From an emergency management perspective, increasing frequency of events to manage or respond to can strain agency resources, and increasing unpredictability in events can make it more difficult to plan

ahead. Projected trends in extreme weather provide yet another incentive for emergency managers to improve and implement best practices, including coordination with other departments and agencies. Finally, agencies may need to review whether they are planning for the right worst case scenarios.

Several “best practices” exist that emergency managers can implement today to reduce their extreme weather vulnerabilities. Vulnerability assessments of critical infrastructure, evacuation planning, improved internal and external coordination, communications interoperability (across agencies), communicating with the public about conditions, breaking down silos within and across agencies, tradeoff analysis between investments and operational changes, opportunistic infrastructure hardening, post-event debriefs, staff training, cross-training, and updated drills and tabletop exercises are all examples of such best practices.

Moving forward, we can continue to improve our understanding of the problem through monitoring weather trends, vulnerabilities, and response metrics. Peer exchanges, all-hazards planning, and interdisciplinary coordination can all also help, as we work to institutionalize and improve upon the emergency management practice the community has been building over decades.

## DISCUSSION SUMMARY

The discussion following the presentation focused around challenges that DOT emergency managers face in responding to extreme events, particularly if they increase in severity or frequency. For example:

- DOTs are all doing more with less. Decreasing budgets, increasing response needs, and increasing public expectations for service levels are all challenges. Mother Nature also presents a challenge, with unpredictable and extreme events.
- Emergencies detract from other DOT activities, such as maintenance. When maintenance crews are responding to weather events, maintenance backlogs increase. It also detracts from future capabilities—of course agencies find the resources to respond in a crisis, but it effectively means “borrowing” from the future.
- By nature, people are reactive rather than proactive. Immediately after an emergency there is a lot of support for preparedness, but it wanes quickly.
- It’s also difficult to marshal public support and resources (even from FHWA) for critical but “invisible” things like maintenance.
- Longer term, if these events continue to become more severe and frequent, we would need to start looking at design standards, but it’s difficult to know what to design to.
- In addition, it could start to become a matter of prioritization for DOT resources in the planning process. For example, spending on flood mitigation rather than increasing capacity.
- However, DOTs learn in response to those challenges. For example, Massachusetts DOT is already investing in new equipment in light of the severe 2014-2015 winter.