

4<sup>TH</sup> INTERNATIONAL CONFERENCE FOR  
SUSTAINABLE MOBILITY

& IRF ANNUAL CONFERENCE

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## Transportation Emergency Management for Extreme Weather Events

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[www.irfnet.ch](http://www.irfnet.ch) | [www.adm.co.ma](http://www.adm.co.ma)

## ACKNOWLEDGEMENT



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*This presentation is based on content presented in "Transportation Emergency Management for Significant and Extreme Events: Lessons Learned and Best Practices for Preparedness, Operations, Response, and Communications", produced by International Bridge, Tunnel and Turnpike Association (IBTTA), in February 2022.*

*The report may be found at:*

*<https://www.ibtta.org/sites/default/files/documents/IBTTA%20Publications/Transportation-Emergency-Management-for-Significant-Events-2022.pdf>*





The intense reliance on roadways for mobility and well being make any disruption to typical road operation troublesome and challenging for transportation operators.

Significant Events refer to extraordinary external disruptions to the typical operations of the transportation system and include:

- ✓ Severe weather (heavy snow and ice, hurricanes, high wind conditions)
- ✓ Natural disasters (flooding, fires, earthquakes)
- ✓ Manmade disasters (terrorism, insurrections)
- ✓ Planned events (Olympics, sporting events, large public gatherings, etc.)

## EXTREME SNOWSTORM EVENTS IMPACTING MOTORWAYS (1/5)



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**January 2022**  
**I-95 Highway**  
**Virginia, USA**

Storm with rapidly-falling snow → Number of Jack-knifed Tractor-trailers and hundreds of other accidents.

- 40-mile stretch of Interstate 95 impossible to traverse by car
- Hundreds of drivers either abandoned their vehicles altogether or were stranded on the highway overnight.



**January 2022**  
**Kentucky, USA**

Kentucky Snowstorm → State of Emergency.

- Schools closed
- An untold number of drivers were left stranded in their vehicles



## EXTREME SNOWSTORM EVENTS IMPACTING MOTORWAYS (2/5)



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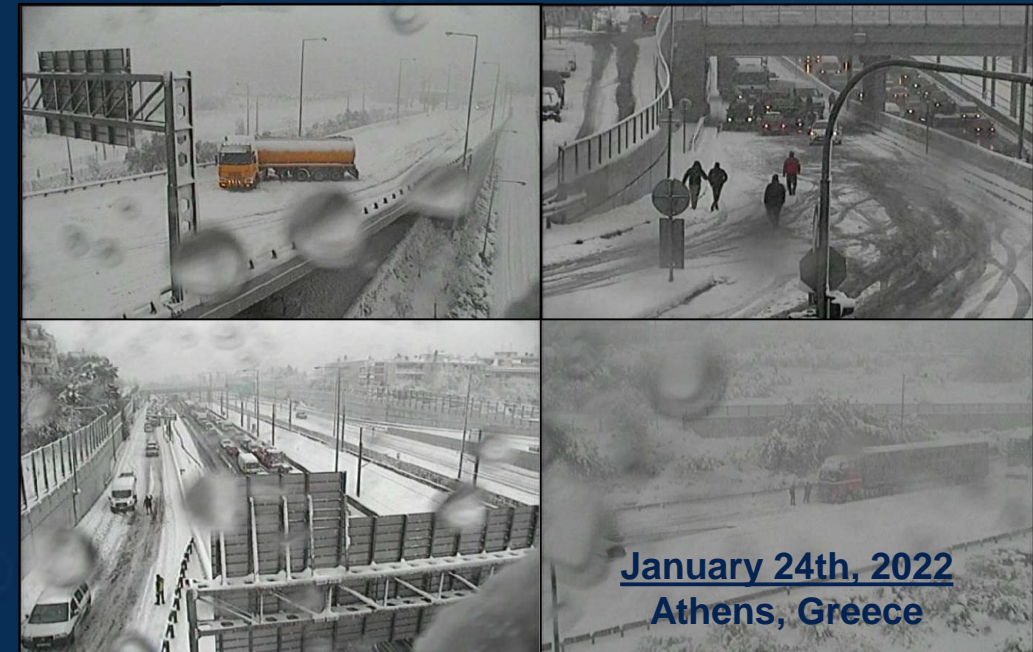
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Winter Storm "Landon" → Impacts on a number of states. Indicatively, Texas, saw a 17-hour backup on Interstate 10 northwest of San Antonio.

Heavy snowstorm "Elpida" in Athens, Greece → Jack-knifed tractor trailers

- 3,500 vehicles trapped on the Athens Ring Road (Attiki Odos).
- The Greek Army was called into evacuation and rescue operation of stranded motorists.



## EXTREME SNOWSTORM EVENTS IMPACTING MOTORWAYS (3/5)



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**January 2014**  
**Atlanta Metropolitan Area**  
**Georgia, USA**

Unusual snowstorm with many people stranded in their vehicles and thousands of motorists in their cars for up to 24 hours.

Historic storm, resulting in "Over 500 vehicles and hundreds of motorists being trapped and stranded for approximately 24 hours along a rural 12-mile section of the Pennsylvania Turnpike's mainline"



**January 2016**  
**Turnpike**  
**Pennsylvania, USA**

Unprecedented extreme snowfall event left much of Broome County, New York (home to the Binghamton metropolitan area) under at least 30 inches of snow. The area was inundated with snowfall that "Broke a 24-hour snowfall record that dated back to February of 1961."



**March 2017**  
**Broome County,**  
**New York**



## EXTREME SNOWSTORM EVENTS IMPACTING MOTORWAYS (4/5)



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Storm "Filomena", an unexpectedly heavy snowfall, blocked roads and left the emergency services unable to circulate. It was considered the heaviest snowfall since 1971.



Heavy snowfall and ice left more than 2,000 vehicles stranded for several hours overnight, as the snowploughs were blocked by trucks that accessed the mountainous stretch of the A40 highway at Bellegarde-sur-Valsérine without proper equipment. Emergency services were then deployed to help clear the road.

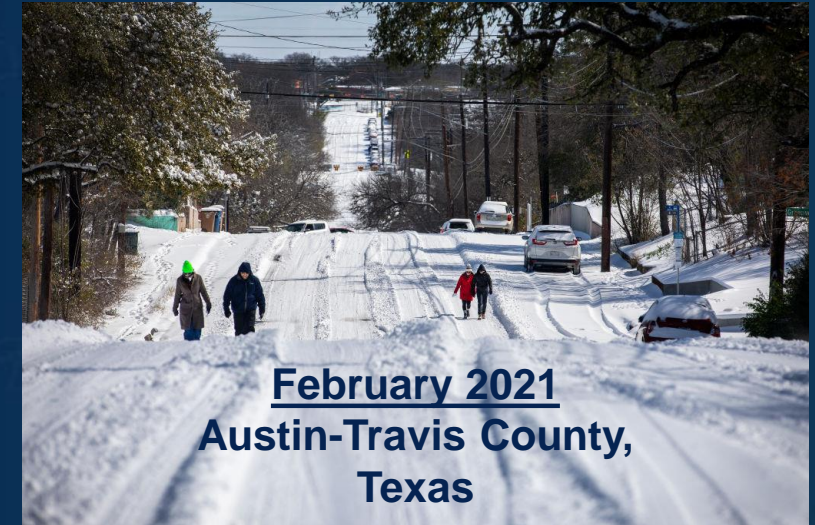
## EXTREME SNOWSTORM EVENTS IMPACTING MOTORWAYS (5/5)



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Winter Storm Uri struck the central part of the country in February 2021. The results were that about half the population of the U.S. was placed under a winter weather alert issued by the National Weather Service, and five million people experienced blackouts. "The storm led to the largest blackout since the Northeast Blackout in 2003 and was the deadliest winter storm since the Storm of the Century in 1993."



Heavy snowfall paralyzes northern and central Germany. The A2 motorway was blocked in both directions and an enormous 37 kilometre line of traffic built up, due to trucks coming to a standstill in the snow and not being able to get out. The A10 and A4 motorways also faced problems and drivers were stranded for 15 hours.



# CLIMATE CHANGE



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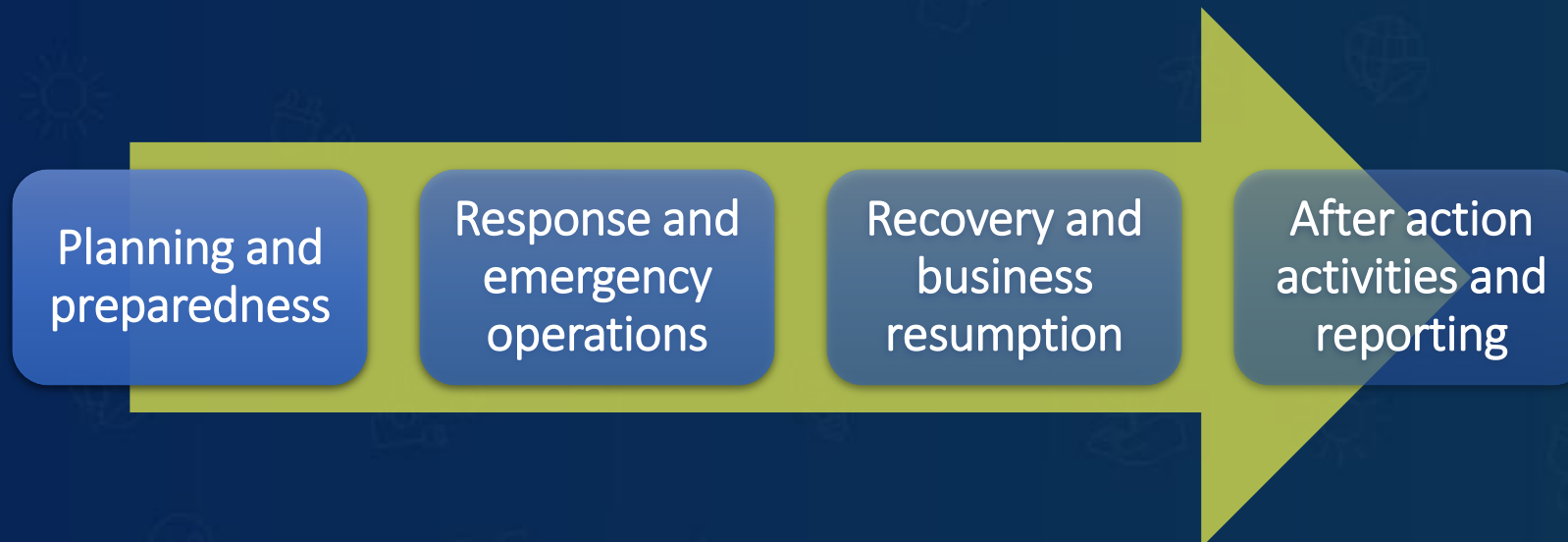
Climate change is making disruptions more frequent and intense. This leads to new challenges that Transportation Operators need to face.



- 1) Growing expectation from travelers and government officials that the transportation system will continue to function and any impact will be mitigated rapidly afterwards.
- 2) Need for adaption of "Professionally recognized" standards and procedures, extensive training and increased specialization of staff and systems.



Transportation operations and emergency management to significant events must be adaptive and responsive to the life cycle of the event, including:



# CRITICAL SUCCESS FACTORS FOR MANAGING SIGNIFICANT EVENTS (1/2)



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## Planning and Readiness

- Establishment of a comprehensive emergency response plan to understand roles and responsibilities within the organization and the required coordination with entities outside of the organization
- Ensure organization preparedness through all phases of managing an emergency event
- Availability of predetermined traffic plans and evacuation routes

## Continuous Improvement and Practice

- Regular update of emergency response plan
- Use of after-action reviews and lessons learned
- Drills and exercises simulating potential scenarios





# CRITICAL SUCCESS FACTORS FOR MANAGING SIGNIFICANT EVENTS (2/2)



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## Ongoing Situational Awareness

- Knowing real-time operating conditions, asset conditions and resource logistics.
- Coordination contributes to overall effectiveness.
- Establishment of a central emergency operations centre.



## Robust and Coordinated Communication

- Crucial to ensure effective decisions among the players.
- Recognition of different audiences that require information.
- Use of a wide variety of communication channels.

Innovation and new technologies can have an important role in managing extreme weather events.

### Regional Transportation Information Systems:

Integrates and shares information among transportation operators, public safety organizations, incident responders, and government agencies at all levels.

- ✓ Making better decisions through information from many sources.
- ✓ Understanding impacts of response actions on traffic.
- ✓ Monitoring traffic and delays.

### Meteorological Data and Expertise:

Weather forecasts that provide insights into the magnitude, extent, and timing of impending extreme weather conditions.

- ✓ Increase of emergency preparedness.
- ✓ Better understanding of the confidence of weather forecasts.
- ✓ Data integration into metrics that can prompt specific transportation decisions.

## LEVERAGING EXISTING BUSINESS PROCESSES AND SYSTEMS



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- Determining the risks associated with possible disruptions and failures.
- Resource allocation optimisation in order to prevent or mitigate negative impacts of significant events.
- Asset Management Programs to support preventive measures, resiliency protections, and recovery plans.
- Take a long-term view of the resilience of infrastructure in order to protect structures from the threats of extreme events.
- Change the designs, as climate change is better understood.





- ❖ **A Unified Incident Command Structure (UICS)** established by the public agencies involved in the response effort is **THE** best practice for large-scale events.
- ❖ Strong coordination practices among public transportation agencies help to balance different organizational mandates, responsibilities, and standard operating procedures.
- ❖ Communication is among the most important emergency management functions.
- ❖ Streamlined management decision-making and execution in order to speed up recovery.

# THE WAY TO DEAL WITH EXTREME EVENTS



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- Ensure clear Public Leadership, by setting up a Unified Incident Command Structure (UICS)
- Issue prevention and safety measures, such as travel restrictions and vehicle bans, well in advance of the phenomenon
- Communicate all relevant warnings and restrictions effectively by all means of media.
- Consider fully the impacts that actions on one part of the network may have on adjacent facilities and networks
- Establish continuous line of communication of all stakeholders with the UICS
- Institute high-alert procedures and mechanisms that ensure availability and quick response of all relevant responders as needed



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# THANK YOU!

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