



Transportation Resilience 2023: International Conference on Extreme Weather and Climate Change Challenges

NOVEMBER 13–15, 2023
Washington, D.C.

Supported by
U.S. Department of Transportation
American Association of State Highway and Transportation Officials

Sponsored by
Standing Committee on Natural Hazards and Extreme Weather Events (AMR50)

Convened by
Transportation Research Board

**NATIONAL
ACADEMIES** *Sciences
Engineering
Medicine*

TRB TRANSPORTATION RESEARCH BOARD

Always pushing beyond.

At Jacobs, we think differently about the future, to deliver bold solutions and create a more connected, sustainable world.

We tackle challenges in emerging technologies, cyber, intelligence, space, training, energy transformation, and resiliency to ensure national security. As the world's thinkers, visionaries, and doers we disrupt the status quo and affect real, meaningful change in how we provide solutions to our customers, operate our business, and support communities.

We're pushing the limits of what's possible to create the standard for what's to come.



Follow us @JacobsConnects | [jacobs.com](https://www.jacobs.com)



Jacobs

Challenging today.
Reinventing tomorrow.

WELCOME FROM MARK ABKOWITZ, STEVEN OLMSTED, AND BRENDA DIX CO-CHAIRS, TR2023 PLANNING COMMITTEE

On behalf of the Standing Committee on Natural Hazards and Extreme Weather Events of the Transportation Research Board (TRB), the U.S. Department of Transportation (USDOT), and the American Association of State Highway and Transportation Officials (AASHTO), it is our pleasure to welcome you to the nation's Capital and the Transportation Resilience 2023 conference at the historic National Academy of Sciences Building.

Importantly, *Transportation Resilience 2023: International Conference on Extreme Weather and Climate Change Challenges* represents a unique opportunity for exchanging ideas and learning more about the latest transportation resilience concepts and applications. It provides a platform for national and international dialogue on research, implementation and lessons learned, with benefits that are expected to extend beyond the transportation sector. The range of best practices we will explore and share during the meeting includes resilience approaches that utilize change management, stakeholder communication and innovative financing, to complement traditional engineering and hardening solutions.

This conference builds on the successes of the first conference held in 2015, the 2018 Transportation Resilience Innovations Summit and Exchange (Transportation RISE), and the Transportation Resilience 2019. Your contribution will help make this conference a success and advance practice and research for resilience solutions to natural hazards of our transportation systems. This is going to be an incredible forum for an exchange of ideas and learning more about the latest thinking on transportation resiliency.

We look forward to having an interesting, thought-provoking, exchange of ideas. We encourage you to take advantage of networking opportunities throughout the conference, particularly during the poster session and reception. Be sure to access any relevant reports and other solutions to your challenges back home. Keep in mind, one learning objective for TR2023 invites you to build a peer learning network to exchange ideas, discuss the current challenges, and learn new methods and solutions.

If you have any questions or need any assistance, TRB staff are here for you.

Enjoy TR2023 and become active in TRB resilience committees!

Mark Abkowitz
Vanderbilt University

Steven Olmsted
Arizona DOT

Brenda Dix
ITF International

This is going to be an incredible forum for an exchange of ideas and learning more about the latest thinking on transportation resiliency.

PLANNING COMMITTEE

With enormous gratitude and thanks to the Planning Committee members and liaisons.

CO-CHAIRS

Mark Abkowitz, Vanderbilt University

Brenda Dix, ICF

Steven Olmsted, Arizona Department of Transportation

PLANNING COMMITTEE MEMBERS

Annie Bennett, Georgetown Climate Center

Chen Chen, Oklahoma State University

Aimee Flannery, Jacobs

Albert Romano, ATCS

Mosi London, Arlington County (VA) Department of Transportation

Sandy Hertz, Maryland Department of Transportation

Daniel Murray, American Trucking Research Institute

Mark Teschauer, U.S. Climate Alliance

Wenxin Qiao, World Bank

LIAISONS

Shawn Johnson, Office of Assistant Secretary for Research and Technology,
U.S. Department of Transportation

John Dean, American Association of State Highway and Transportation Officials

Heather Holsinger, Office of the Under Secretary for Policy, U.S. Department of Transportation

Bradley Dean, Federal Emergency Management Agency, U.S. Department of Homeland Security

Ellen Mecray, National Oceanic and Atmospheric Administration

Rebecca Lupes, Federal Highway Administration, U.S. Department of Transportation

TRB STAFF

William Anderson, Senior Program Officer

James Manning, Operations Coordinator

Gary Jenkins, Program Operations Manager

The Transportation Research Board is one of seven major programs of the National Academies of Sciences, Engineering, and Medicine. The mission of the Transportation Research Board is to increase the benefits that transportation contributes to society by providing leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied committees, task forces, and panels annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.

www.TRB.org

Photo credit: Cover-Shutterstock.com

SCHEDULE AT-A-GLANCE

Monday, November 13		
Time	Session Title	Room
7:00 AM	Registration Opens	NAS Lobby
7:30 AM–8:30 AM	Breakfast	West Court
8:30 AM–9:15 AM	Welcome and Opening Plenary	Fred Kavli Auditorium
9:15 AM–10:15 AM	Plenary Session: Advancing Resilience in Surface Transportation - Roads, Rail, Port and Transit	Fred Kavli Auditorium
10:15 AM–10:30 AM	Break	West Court
10:30 AM–12:00 PM	Technical Session A: Adaptation Planning Around the World	Lecture Room
	Technical Session B: Mitigating and Reducing Impacts of High-Risk Flooding Events	NAS 125
	Technical Session C: Measuring Resilience Benefits: Lessons Learned	NAS 120
	Technical Session D: Vulnerability Assessment Frameworks and Tools	Board Room
12:00 PM–1:30 PM	Lunch	West Court
1:30 PM–3:00 PM	Technical Session E: State Departments of Transportation Taking Action	NAS 125
	Technical Session F: Transit and Rail Resilience Assessments	NAS Members' Room
	Technical Session G: Development of Resilience Improvement Plans under PROTECT	Board Room
	Technical Session H: Cost-Benefit Assessments	Lecture Room
3:00 PM–3:30 PM	Break	West Court
3:30 PM–5:00 PM	Technical Session I: Using Federal Highway Administration's New Resilience Handbooks	NAS 120
	Technical Session J: Pavements	Board Room
3:30 PM–5:30 PM	Workshop: Integrating Equity into Resilience	Lecture Room
	Workshop: Justifying Investment in Climate Resilient Transportation Infrastructure: Challenges and Opportunities	NAS Members' Room
5:00 PM–7:00 PM	Poster Session and Networking Reception	Great Hall
7:00 PM	Adjourn	

Tuesday, November 14 >>

SCHEDULE AT-A-GLANCE

Tuesday, November 14		
Time	Session Title	Room
7:00 AM	Registration Opens	NAS Lobby
7:30 AM–8:30 AM	Breakfast	West Court
8:30 AM–10:00 AM	Technical Session K: Design Standards for Resilient Transportation	NAS 125
	Technical Session L: Regional Resilience Planning (Part A)	NAS Members' Room
	Technical Session M: Geotechnical Modeling and Geohazards (Part A)	Board Room
	Technical Session N: Flood Risks in Transportation	Lecture Room
10:00 AM–10:30 AM	Break	West Court
10:30 AM–12:00 PM	Technical Session O: Developing a Business Case and Communications Strategy for Resilience Efforts	NAS 120
	Technical Session P: How Midwestern State Departments of Transportation are Addressing Resilience	Board Room
	Technical Session Q: Nature-based Solutions	Lecture Room
	Technical Session R: Equity in Resilience (Part A)	NAS 125
12:00 PM–1:30 PM	Lunch	West Court
1:30 PM–3:00 PM	Technical Session S: Designing Resilient Transportation Infrastructure	Board Room
	Technical Session T: Community Resilience	Lecture Room
	Technical Session U: Visualization and Modeling	NAS 120
	Technical Session V: Agency Culture for Resilience	NAS 125
3:00 PM–3:30 PM	Break	West Court
3:30 PM–5:00 PM	Plenary Session: Global Resilient Transportation - Blending Finance, Insurance, Risk, and New Decision Theory Models	Fred Kavli Auditorium
5:30 PM–7:00 PM	Meeting: Emergency Management and Security	NAS Members' Room
7:00 PM	Adjourn	

SCHEDULE AT-A-GLANCE

Wednesday, November 15		
Time	Session Title	Room
7:00 AM	Registration Opens	NAS Lobby
7:30 AM–8:30 AM	Breakfast	West Court
8:30 AM–10:00 AM	Technical Session W: Maritime Resilience	Lecture Room
	Technical Session X: Equity in Resilience (Part B)	Board Room
	Technical Session Y: More Tools and Toolkits	NAS Members' Room
	Technical Session Z: Geotechnical Modeling and Geohazards (Part B)	NAS 120
10:00 AM–10:30 AM	Break	West Court
10:30 AM–12:00 PM	Technical Session AA: Asset Management	Board Room
	Technical Session AB: Emergency Management	NAS 120
	Technical Session AC: Regional Resilience Planning (Part B)	NAS 125
12:00 PM–1:30 PM	Closed Meeting: Resilience Coalition Meeting (Invitation Only)	NAS 118
12:30 PM–1:30 PM	Closing Lunch Plenary: Climate Science Tools, Resources and Needs	Great Hall
1:30 PM	Adjourn	



TRB 103rd

ANNUAL MEETING

On January 7–11, 2024, join the single largest gathering of transportation practitioners and researchers in the world.
Register today!

www.trb.org/AnnualMeeting



SCAN ME

Advancing *resilience*
for a Future Ready® world.



WSP delivers organizational and infrastructure resilience through the entire project life cycle, including environmental impact, air quality, climate risk assessments, adaptation planning, funding and financing, asset design, ground engineering, materials testing, construction management, and disaster response and recovery.



 AtkinsRéalis

Engineering a
better future for
our planet and
its people

atkinsrealis.com

TRR

JOURNAL OF THE TRANSPORTATION RESEARCH BOARD

TRANSPORTATION
RESEARCH
RECORD

Enjoy free access to
the TRR for 30 days: sagepub.com/freetrial



Detailed Conference Program

To view the detailed conference program, scan the QR code or go to: qrco.de/beSHrP.

Professional Development Hours

For statement of professional development hours credit, please scan the QR code, or go to: qrco.de/beSHzY.



Venue Floorplan

To view a floorplan of the National Academies of Sciences, Engineering, and Medicine, please scan the QR code, or go to: <https://qrco.de/beSI3m>.



Thank you to our Patrons!

PLATINUM

Jacobs

Challenging today.
Reinventing tomorrow.

GOLD



SILVER

AtkinsRéalis

BRONZE



NATIONAL
ACADEMIES

Sciences
Engineering
Medicine

TRB | TRANSPORTATION RESEARCH BOARD