



Seventh Biennial Conference on the Marine Transportation System

Innovative Science and Technologies Toward Greater Sustainability

JUNE 20–22, 2023
Washington, D.C.

Convened by
Transportation Research Board

In partnership with
The U.S. Committee on the
Marine Transportation System



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 TRANSPORTATION RESEARCH BOARD

PLANNING COMMITTEE

This conference would not have been possible without the combined efforts of many individuals.

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Lee Kindberg, Maersk North America

CONFERENCE PLANNING COMMITTEE AND FEDERAL LIAISONS

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Gareth Burton, American Bureau of Shipping

Ian Gansler, American Association of Port Authorities

Daniel Hackett, Hackett Associates LLC

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Stephen Shafer, SSA Marine

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Heather Gilbert, National Oceanic and Atmospheric Administration (NOAA)

Dennis Johnson, Environmental Protection Agency (EPA)

Sarah Larkin, Department of Homeland Security (DHS)

Chad Ray, U.S. Coast Guard (USCG)

Todd Ripley, Maritime Administration (MARAD)

Luis Villanueva, U.S. Coast Guard (USCG)

Grant Voirol, Committee on the Marine Transportation System (CMTS)

Eddie Wiggins, U.S. Army Corps of Engineers (USACE)

TRB STAFF

Scott Brotemarkle, Marine Board Program Director, Senior Program Officer, Marine Transportation

Tess Austin, Program Operations Coordinator

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.

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WELCOME FROM LEE KINDBERG CONFERENCE CHAIR

It gives me great pleasure to welcome you to the Seventh Biennial Conference on the Marine Transportation System (MTS). Our theme this year is Innovative Science and Technologies Towards Greater Sustainability.

With the Sixth Biennial conference in 2021 held in a virtual format due to COVID-19, we are so pleased to be back in person again with our maritime colleagues for this next iteration of the series. What a difference these three years have made, in our lives, our strategies, our communication methods and in the innovations in fuels and technologies being prioritized to address major issues for the MTS. In spite of the many challenges of the pandemic, we have actually seen acceleration in recognizing sustainability issues and in work by a broad range of researchers, industry participants and other stakeholders to innovate, develop and deploy new technologies, approaches, fuels and systems for the MTS.

Shipping's role in climate change has certainly been elevated, leading to a sense of urgency from international to national to local levels, and from Board rooms to laboratories to the media. But many other issues must be addressed concurrently, and a full spectrum of tools must be deployed to optimize results, deploy resources and mitigate community and environmental justice impacts. We have come to recognize that no one entity can deal with these issues alone. Working together has become essential.

Our program this week highlights these issues and is intended to help us understand the roles of government, industry, and others in moving forward. Our intended outcome is a fuller understanding of priorities and challenges, and how research and innovation can help us all move forward. We have assembled an interesting spectrum of participants in hopes that we all increase our networks to be more effective.

On behalf of the planning committee, we welcome your engagement as policy makers, transportation agency practitioners, academia, private sector stakeholders, and consultants. We appreciate the contributions by the many prestigious panelists, keynote speakers and participants. We hope this conference, like previous ones in this series, will continue to be a catalyst for innovation and collaboration to improve the MTS.

Lee Kindberg
Conference Chair



**Our theme this
year is Innovative
Science and
Technologies
Towards Greater
Sustainability.**



TRB 103rd

ANNUAL MEETING

January 7–11, 2024 • Washington, D.C.

TRB's Annual Meeting attracts thousands of transportation professionals from around the world.

We look forward to seeing you in Washington, D.C. for the 103rd Transportation Research Board Annual Meeting. For more information, please scan the QR code.



SCAN ME

TRR

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SCHEDULE AT-A-GLANCE

	Tuesday 6/21	Wednesday 6/21	Thursday 6/22	
8:00 AM	Breakfast Great Hall 7:30-8:30 AM	Breakfast Great Hall 7:30-8:30 AM	Breakfast Great Hall 7:30-8:30 AM	
8:30 AM	Opening Session Opening Keynote Address Auditorium 8:30-10:00 AM	Plenary 3: Auditorium 8:30-10:00 AM	Registration, Great Hall	
9:00 AM				
9:30 AM				
10:00 AM	Break Great Hall 10:00-10:30 AM	Break Great Hall 10:00-10:30 AM	Break Great Hall 10:00-10:30 AM	
10:30 AM	Plenary 1: Auditorium 10:30 AM-12:00 PM	Breakout Session 1A: NAS 125 10:30 AM- 12:00 PM	Registration, Great Hall	
11:00 AM				Breakout Session 1B: Lecture Room 10:30 AM- 12:00 PM
11:30 AM				
12:00 PM	Lunch Great Hall 12:00-1:00 PM	Lunch Great Hall 12:00-1:00 PM	Closing Session Lecture Room 10:30 AM-12:00 PM	
12:30 PM	Keynote Address Auditorium 1:00-2:00 PM	Keynote Address Auditorium 1:00-2:00 PM		
1:00 PM				
1:30 PM	Break Great Hall 2:00-2:30 PM	Student Honor Panel Auditorium 2:00-3:00 PM		
2:00 PM				
2:30 PM	Plenary 2: Auditorium 2:30-4:00 PM	Break Great Hall 3:00-3:30 PM		
3:00 PM				
3:30 PM				
4:00pm	Reception Great Hall 4:00-5:30 PM	Breakout Session 2A: NAS 125 3:30-5:00 PM		TRB Marine Standing Committee Meetings 1:00-4:00 PM
4:30 PM				
5:00 PM			Breakout Session 2C: NAS 120 3:30-5:00 PM	
5:30 PM				

CONFERENCE PROGRAM

TUESDAY, JUNE 20, 2023

7:30 AM–8:30 AM

Breakfast

Great Hall

Scan the QR Code
for the online program.



8:30 AM–10:00 AM

Call to Order and Conference Welcome

Auditorium

Opening Remarks

Introduction of Major General William H. “Butch” Graham

Brian Tetreault, Acting Executive Director, U.S. Committee on the Marine Transportation System (CMTS)

Major General William H. “Butch” Graham, Deputy Chief of Engineers and Deputy Commanding General, U.S. Army Corps of Engineers, CMTS Coordinating Board Chair

Keynote Address

Miriam Goldstein, Director of Ocean Policy, White House Council on Environmental Quality

10:00 AM–10:30 AM

Break

Great Hall

10:30 AM–Noon

Plenary Session I - Federal Perspectives on Decarbonization and Sustainability in the Marine Transportation System

Auditorium

Moderator: Helen Brohl, Former Executive Director of the U.S. Committee on the Marine Transportation System (CMTS)

- **Major General William Graham**, Deputy Commanding General for Civil and Emergency Operations, U.S. Army Corps of Engineers
- **Paul Huang**, Deputy Director, Bureau of Safety and Environmental Enforcement
- **Adena Leibman**, Senior Advisor, Office of the Under Secretary/NOAA Administrator, National Oceanic and Atmospheric Administration
- **Karl Simon**, Director, Transportation and Climate Division, Environmental Protection Agency

- **Daniel Yuska**, Director, Office of Environment and Innovation, Maritime Administration
- **Michael Emerson**, Director, Marine Transportation Systems, U.S. Coast Guard
- **Josh Messner**, Bioenergy Technology Office, Department of Energy

Noon–1:00 PM

Lunch

Great Hall

1:00 PM–2:00 PM

Post Luncheon Keynote - Accelerating Marine Decarbonization: Progress, Challenges and Best Practices

Auditorium

Bo Cerup-Simonsen, CEO, Mærsk McKinney Møller Center for Zero Carbon Shipping

2:00 PM–2:30 PM

Break

Great Hall

2:30 PM–4:00 PM

Plenary Session II - Decarbonization and Sustainability: Maritime Industry Perspectives

Auditorium

Moderator: Lee Kindberg, Maersk North America

- **Jennifer States**, Vice President and Chief Strategy Officer, Blue Sky Maritime Coalition
- **Tanja Grzeskowitz**, Principal Environmental Programs Specialist, Port Authority of New York and New Jersey
- **CAPT Jennifer Williams (USCG-Ret.)**, VP, Maritime Policy, Cruise Lines International Association
- **Teresa Christopher**, Head of Sustainability Policy, Amazon
- **Bud Darr**, Executive Vice President, Maritime Policy, MSC Group

4:00 PM–5:30 PM

Networking Reception

Great Hall

WEDNESDAY, JUNE 21, 2023

7:30 AM–8:30 AM

Breakfast

Great Hall

8:30 AM–10:00 AM

Plenary Session III: Sustainability, Environmental Justice, and Social Equality in Maritime

Auditorium

Moderator: Lee Hutchins, EPT, Ltd.

- **Karl Simon**, Director, Transportation and Climate Division, Environmental Protection Agency
- **Christina Billingsley**, Senior Program Manager, Community Engagement, Port of Seattle
- **Rich Brown**, Lead Organizer, Duwamish Valley Port Community Action Team
- **Terrance L. Bankston**, Senior Ports and Freight Campaigner, Friends of the Earth U.S.
- **Erica Rule**, Chief of Staff, Science Planning and Operations, National Oceanic and Atmospheric Administration, Fisheries Science Center - Advisor to MAST Academy, Miami, FL

10:00 AM–10:30 AM

Break

Great Hall

10:30 AM–Noon

Concurrent Technical Breakout Sessions I

1A: Alternative Fuel Distribution and Networks

NAS 125

Moderator: Todd Ripley, Maritime Administration

- *The Maritime Nexus Supporting a National Network of Hydrogen Hubs*
Kirk Waltz, American Bureau of Shipping
- *Exploring Drivers for the Design and Construction of Offshore Hydrogen Production Facilities*
James Abrams, American Bureau of Shipping
- *Distribution of Alternative Fuels Across Future Fleets*
Steven O'Malley, Leidos

1B: Electrification of Vessels, Ports, and Associated Infrastructure

Lecture Room

Moderator: Cary Davis, American Association of Port Authorities

- *The Status of Technological Solutions Towards Zero-Emission Port Stays*
Thalis Zis, Cyprus University of Technology
- *Trends in Energy Density Balanced With Power Density; The Tension between Marine Requirements Across the Spectrum of Applications*
Chad Rogers, Spear Power Systems
- *Electrification at the Port of Oakland*
Tim Leong, Port of Oakland

1C: Regulatory Environment Influencing Decarbonization Strategies

NAS 120

Moderator: Richard Billings, Eastern Research Group, Inc.

- *Pathways for Public / Private Cooperation for Advancing National Blueprint for Transportation Decarbonization*
Jennifer States, Blue Sky Maritime Coalition
- *Latest Developments Regarding MARPOL Annex VI and IMO's Strategy for Decarbonizing International Shipping*
Wayne Lundy, U.S. Coast Guard

Noon–1:00 PM

Lunch

Great Hall

1:00 PM–2:00 PM

Post Luncheon Keynote–The Role of Demand in Driving the Transition to Zero-Emission Shipping: Cracking the Chicken and Egg

Auditorium

Ingrid Irigoyen, Director, Aspen Institute Shipping Decarbonization Initiative



2:00 PM–3:00 PM

Student Honor Panel

Auditorium

Moderator: Heather Gilbert, National Oceanic and Atmospheric Administration, Deputy Director, U.S. Committee on the Marine Transportation System (CMTS)

- *Quantum Computing and Machine Learning for Optimizing Port Operations: A Path Towards Sustainable Marine Transportation System*
Nazmus Asif, Texas Southern University
- *Current Trends/State of Practice for Maritime Alternate Fuels*
Dongpyo Hong, Cornell University
- *Resilience of Sabine Neches Waterway: Capacity Restoration and Flow Analysis for Deep Draft Waterways*
Golnoosh Toosi, Lamar University

3:00 PM–3:30 PM

Break

Great Hall

3:30 PM–5:00 PM

Concurrent Technical Breakout Sessions II

2A: Alternative Fuels: Pathways to Decarbonization

NAS 125

Moderator: Kevin Bartoy, Washington State Ferries

- *Technical Feasibility Assessment of Biofuels for Maritime Applications*
Mike Kass, Oak Ridge National Laboratory
- *Onboard Carbon Capture – Challenges and Future Success*
Quaim Choudhury, American Bureau of Shipping
- *Perspectives on Decarbonization within Short-Sea Shipping: Future Pathways for Ferries*
Kevin Bartoy, Washington State Ferries

2B: Sustainable Routing and Navigation

Lecture Room

Moderator: Daniel Hackett, Hackett Associates, LLC.

- *Marine Weather Enterprise – Adapting to the Major Transformation in Maritime Shipping to Promote Sustainability*
AJ Reiss, National Oceanic and Atmospheric Administration
- *Weather Observations via vessel AIS - Existing Technology, Exciting Potential*
Marin Kress, U.S. Army Corp of Engineers

- *Precision Marine Navigation*
Darren Wright, National Oceanic and Atmospheric Administration/Office of Coast Survey
- *Optimized Weather Routing Leveraging Global Buoy Network*
Tosca Lichtenheld, Sofar Ocean Technologies, Inc.

2C: Green Shipping Corridors

NAS 120

Moderator: Grant Voirol, U.S. Committee on the Maritime Transportation System

- *Simulation & Optimization of Green Shipping Corridors and Other Clean Energy Marine Transportation Operations*
David Walker, American Bureau of Shipping
- *Well-to-Wake Life Cycle Analysis for Promising Alternative Fuels with Consideration of Green Shipping Corridors*
Kirk Waltz, American Bureau of Shipping
- *Decarbonizing UK Maritime Sector and the Role for Green Corridors*
Eamonn Beirne, UK Shore, DfT

5:00 PM

Adjourn



THURSDAY, JUNE 22, 2023

7:30 AM–8:30 AM

Breakfast

Great Hall

8:30 AM–10:00 AM

Concurrent Technical Breakout Sessions III

3A: Alternative Fuel Diversification

Members Room

Moderator: Gareth Burton, American Bureau of Shipping

- *Dual-Fuel Technology for Marine Applications*
Essam Elhannouny, Argonne National Laboratory
- *Modeling of Ammonia Releases within a Vessel Engine Room*
Zhongfu Ge, American Bureau of Shipping
- *A Novel High-Lift Device for Ship Wing Sails, Using Powered Distributed Propellers*
Sergio Perez, U.S. Merchant Marine Academy
- *Modern Nuclear Reactor System Architectures for Decarbonized Civil Maritime Transportation*
Jonathan Stephens, BWX Technologies

3B: Alternative Fuel Use, Carriage and Technology Regulation

NAS 120

Moderator: Joe Meyers, ABS Group

- *The Renewable Fuels Standard and the Maritime Energy Transition*
Margaret Kaigh, Transparenssea Fuels
- *Use of Alternative Fuels*
Tim Meyers, U.S. Coast Guard
- *Bulk Carriage of Alternate Fuels by Vessels*
Daniel Velez, U.S. Coast Guard
- *Alternative Designs for Emerging Technologies*
Bryan Andrews, U.S. Coast Guard

3C: Decarbonizing Inland Waterway Systems and Underwater Noise

NAS 125

Moderator: Lee Hutchins, EPT, Ltd.

- *Decarbonizing Maritime Shipping: Challenges and Opportunities in the Inland Marine Sector*
Leah Dundon, Vanderbilt University

- **Multi-Modal Transport of Upper Mississippi River System Sand to Support Coastal Beach Nourishment**
Ben Emery, U.S. Army Corp of Engineers
- **Did you hear? Latest underwater Noise Reduction Efforts at the IMO and in the Puget Sound**
Carol Yin, U.S. Coast Guard

10:00 AM–10:30 AM

Break

Great Hall

10:30 AM–Noon

Conference Closing Session

Lecture Room

This open forum interactive session will bring forward the key maritime innovative science and technology concepts, research needs, and lessons learned identified during the conference for future consideration and R&D activity.

1:00 PM–4:00 PM

Concurrent TRB Marine Group Standing Committee Meetings

Conference attendees encouraged to join the meetings!

Ports and Channels (AW010)

Lecture Room

Chaired by Shannon McLeod, American Association of Port Authorities

This committee is concerned with issues of planning, financing, and management of coastal and Great Lakes ports and channels. Coverage includes port maintenance and development issues, technology relating to cargo handling and deep draft vessels, landside access, cruise operations, environmental issues, and other local, state, and national issues which contribute to the integration of water transportation into a multimodal transportation system.

Inland Water Transportation (AW020)

Board Room

Chaired by Erika Witzke, CPCS Transcom

This committee will consider research related to the movement of freight and passengers by inland and intra- and intercoastal waterways. This will include planning, financing, management, vessels, ports and port facilities, environmental considerations, and engineering and operational aspects. The committee will also focus on the intermodal aspects of inland water transportation and intermodal system integration.

Marine Environment (AW030)

NAS 125

Chaired by Richard Billings, Eastern Research Group, Inc.

The committee considers the environmental performance of the maritime transportation system including ports, vessels, waterways, and other maritime activities. These components of the maritime system can best be understood in the context of the efficient movement of goods and people in the regional and national economy. Working in coordination with other TRB committees and task forces, the Committee considers the impact of other modes of transportation on the marine environment.

Marine Safety and Human Factors (AW040)

NAS 120

Chaired by Joseph Myers, ABS Group

The Committee on Marine Safety and Human Factors brings together safety researchers and operating personnel from the marine sector (including both deep-sea and inland waterway operators, across all types of vessel service, harbor operations, as well as offshore industry operations) to identify critical issues and to define, support, and disseminate results of research aimed at enhancing the performance, safety, efficiency, and comfort of those involved in and/or using marine transportation systems. The scope encompasses: The human's role in the operation and control of the full range of marine vessels, vessel management, maintenance, and protection of harbor, coastal and riverine areas; The health, safety, and quality of life of those who operate and maintain these vessels; The comfort and safety of marine transportation system users; The human impact of water transportation and port operations on neighboring communities.

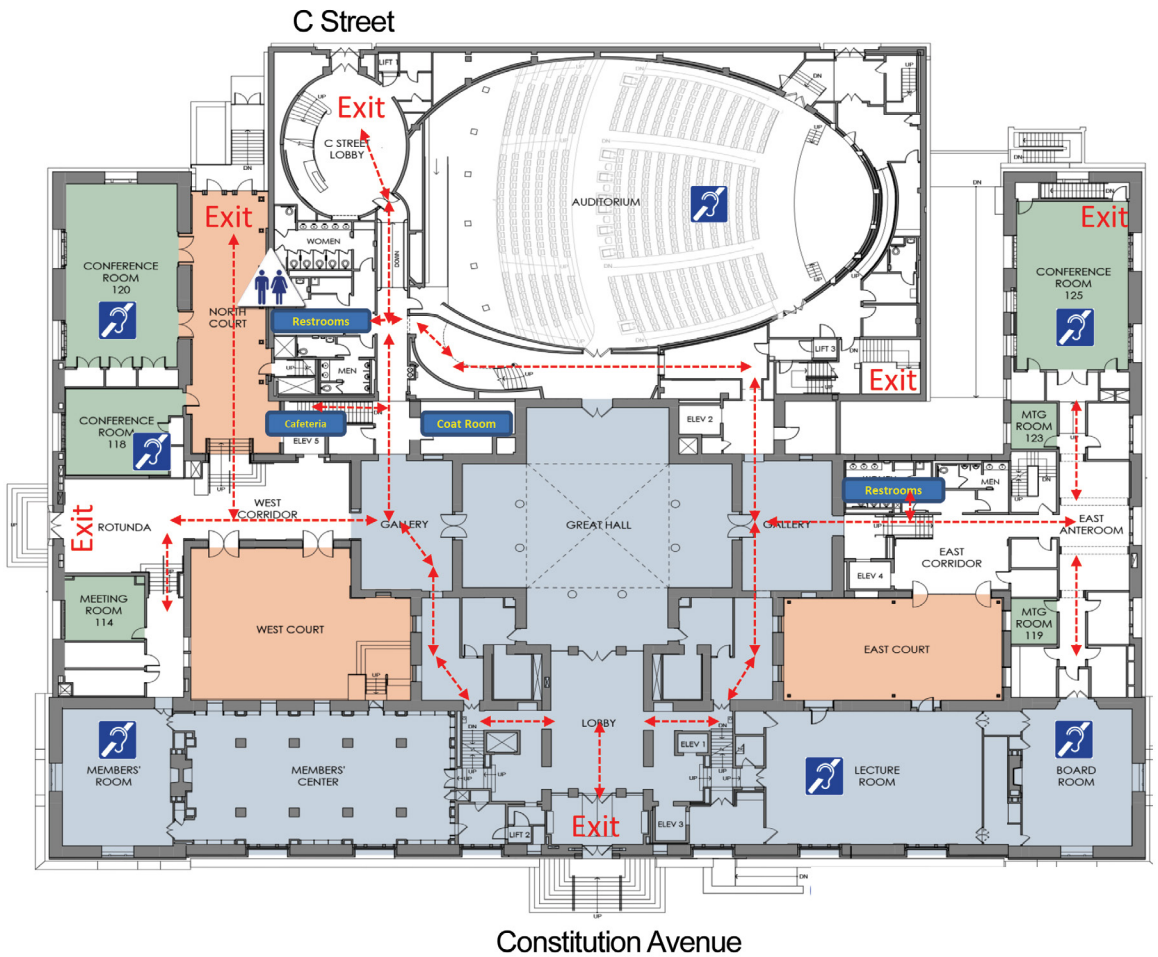
Ferry Transportation (AW050)

Members Room

Chaired by Catherine Peele, North Carolina DOT Ferry Division

The purpose of the committee is to foster and distribute useful research concerning ferry systems to users, operators, suppliers, manufacturers, and regulators. The scope of the research activities concerns ferry requirements, operations, planning, management, design, construction, maintenance, and utilization. Ferries that operate in ocean, coastal, inland, and river environments are included. Ferries are defined as vessels that carry passengers and vehicles with drivers.

FLOOR PLAN



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**Thank you
for attending!**

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