From Sail to Satellite
Delivering Solutions for Tomorrow’s Marine Transportation Systems

4th Biennial TRB–CMTS Research and Development Conference

June 21–23, 2016
National Academy of Sciences Building
Washington, D.C.
## Schedule at a Glance

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
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<tbody>
<tr>
<td>8:00 a.m.</td>
<td>Standing Committee on Marine Safety and Human Factors (AW040) NAS 125 8:00 a.m.–12:00 noon</td>
<td>Breakfast and Exhibits Great Hall 7:30 a.m.–8:30 a.m.</td>
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<tr>
<td>8:30 a.m.</td>
<td>Standing Committee on Critical Transportation Infrastructure Protection (ABR10) NAS 120 8:00 a.m.–12:00 noon</td>
<td>Opening Session featuring Norman Y. Mineta and Marson K. Brown Auditorium 8:30 a.m.–10:15 a.m.</td>
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<tr>
<td>9:00 a.m.</td>
<td>Joint Meeting of the Standing Committees on Ports and Channels (AW010), Inland Water Transportation (AW020), and Marine Environment (AW030) Lecture Room 3:00 p.m.–5:00 p.m.</td>
<td>Break and Exhibits Great Hall 10:15 a.m.–10:45 a.m.</td>
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<tr>
<td>9:30 a.m.</td>
<td>Plenary 1: MTS 2100: Our Next Century Marine Transportation System Auditorium 10:45 a.m.–12:15 p.m.</td>
<td>Lunch and Exhibits Great Hall 12:15 p.m.–1:15 p.m.</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>Breakout Session 1A: Future of Navigation Lecture Room 2:15 p.m.–3:45 p.m.</td>
<td>Breakout Session 1D: Resilience—Tools and Needs Members’ Room 2:15 p.m.–3:45 p.m.</td>
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<tr>
<td>10:30 a.m.</td>
<td>Breakout Session 1B: Infrastructure Investment NAS 125 2:15 p.m.–3:45 p.m.</td>
<td>Breakout Session 1E: Innovative Materials, Part 1 Board Room 2:15 p.m.–3:45 p.m.</td>
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<tr>
<td>11:00 a.m.</td>
<td>Breakout Session 1C: Emissions Management NAS 120 2:15 p.m.–3:45 p.m.</td>
<td>Breakout Session 1F: Marine Transportation Members’ Room 2:15 p.m.–3:45 p.m.</td>
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<td>11:30 a.m.</td>
<td>Breakout Session 1D: Resilience—Tools and Needs Members’ Room 2:15 p.m.–3:45 p.m.</td>
<td>Breakout Session 1G: Innovative Materials, Part 2 Board Room 2:15 p.m.–3:45 p.m.</td>
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<tr>
<td>Noon</td>
<td>Breakout Session 1E: Innovative Materials, Part 1 Board Room 2:15 p.m.–3:45 p.m.</td>
<td>Breakout Session 2A: MTS Performance Measures, Part 1 Lecture Room 4:15 p.m.–5:45 p.m.</td>
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<tr>
<td>12:00 p.m.</td>
<td>Breakout Session 1F: Marine Transportation Members’ Room 2:15 p.m.–3:45 p.m.</td>
<td>Breakout Session 2B: Innovative Technologies, Part 1 NAS 125 4:15 p.m.–5:45 p.m.</td>
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<td>1:00 p.m.</td>
<td>Breakout Session 1G: Innovative Materials, Part 2 Board Room 2:15 p.m.–3:45 p.m.</td>
<td>Breakout Session 2C: Asset Management NAS 120 4:15 p.m.–5:45 p.m.</td>
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<td>1:30 p.m.</td>
<td>Breakout Session 2A: MTS Performance Measures, Part 1 Lecture Room 4:15 p.m.–5:45 p.m.</td>
<td>Breakout Session 2D: Arctic Marine Transportation Members’ Room 4:15 p.m.–5:45 p.m.</td>
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<td>2:00 p.m.</td>
<td>Breakout Session 2B: Innovative Technologies, Part 1 NAS 125 4:15 p.m.–5:45 p.m.</td>
<td>Breakout Session 2E: Innovative Materials, Part 2 Board Room 4:15 p.m.–5:45 p.m.</td>
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<tr>
<td>2:30 p.m.</td>
<td>Breakout Session 2C: Asset Management NAS 120 4:15 p.m.–5:45 p.m.</td>
<td>Breakout Session 2F: Innovative Materials, Part 3 Board Room 4:15 p.m.–5:45 p.m.</td>
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<tr>
<td>3:00 p.m.</td>
<td>Breakout Session 2D: Arctic Marine Transportation Members’ Room 4:15 p.m.–5:45 p.m.</td>
<td>Breakout Session 2G: Innovative Materials, Part 4 Board Room 4:15 p.m.–5:45 p.m.</td>
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<tr>
<td>3:30 p.m.</td>
<td>Breakout Session 2E: Innovative Materials, Part 2 Board Room 4:15 p.m.–5:45 p.m.</td>
<td>Breakout Session 2H: Innovative Materials, Part 5 Board Room 4:15 p.m.–5:45 p.m.</td>
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<tr>
<td>4:00 p.m.</td>
<td>Breakout Session 2F: Innovative Materials, Part 3 Board Room 4:15 p.m.–5:45 p.m.</td>
<td>Breakout Session 2I: Innovative Materials, Part 6 Board Room 4:15 p.m.–5:45 p.m.</td>
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<tr>
<td>4:30 p.m.</td>
<td>Breakout Session 2G: Innovative Materials, Part 4 Board Room 4:15 p.m.–5:45 p.m.</td>
<td>Breakout Session 2J: Innovative Materials, Part 7 Board Room 4:15 p.m.–5:45 p.m.</td>
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<tr>
<td>5:00 p.m.</td>
<td>Breakout Session 2H: Innovative Materials, Part 5 Board Room 4:15 p.m.–5:45 p.m.</td>
<td>Breakout Session 2K: Innovative Materials, Part 8 Board Room 4:15 p.m.–5:45 p.m.</td>
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<td>5:30 p.m.</td>
<td>Breakout Session 2I: Innovative Materials, Part 6 Board Room 4:15 p.m.–5:45 p.m.</td>
<td>Breakout Session 2L: Innovative Materials, Part 9 Board Room 4:15 p.m.–5:45 p.m.</td>
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<tr>
<td>6:00 p.m.</td>
<td>Breakout Session 2J: Innovative Materials, Part 7 Board Room 4:15 p.m.–5:45 p.m.</td>
<td>Breakout Session 2M: Innovative Materials, Part 10 Board Room 4:15 p.m.–5:45 p.m.</td>
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<tr>
<td>6:30 p.m.</td>
<td>Breakout Session 2K: Innovative Materials, Part 8 Board Room 4:15 p.m.–5:45 p.m.</td>
<td>Breakout Session 2N: Innovative Materials, Part 11 Board Room 4:15 p.m.–5:45 p.m.</td>
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**Keynote Address**

Freight Fluidity: How Technology Could Connect the Inland Supply Chain Auditorium 1:15 p.m.–2:00 p.m.

**Transition Break**

**Reception** Great Hall 5:45–7:00 p.m.
<table>
<thead>
<tr>
<th>Time</th>
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<td>8:30 a.m.</td>
<td>Plenary 2 Technology Innovations for a Next Generation MTS Auditorium</td>
<td>Student Honor Panel Auditorium 8:30 a.m.–9:30 a.m.</td>
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<td>9:00 a.m.</td>
<td>Plenary 2 Technology Innovations for a Next Generation MTS Auditorium</td>
<td>Transition Break</td>
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<tr>
<td>9:30 a.m.</td>
<td>Lunch and Exhibits Great Hall Noon–1:00 p.m.</td>
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<td>10:00 a.m.</td>
<td>Breakout Session 3A: MTS Performance Measures Part 2 Lecture Room 10:30 a.m.–Noon</td>
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<tr>
<td>10:30 a.m.</td>
<td>Keynote Address featuring General Darren W. McDew Auditorium 1:00 p.m.–1:45 p.m.</td>
<td>Closing Session Lecture Room 9:45 a.m.–Noon</td>
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<td>11:00 a.m.</td>
<td>Breakout Session 3B: Innovative Technologies Part 2 NAS 125 10:30 a.m.–Noon</td>
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<td>11:30 a.m.</td>
<td>Breakout Session 3C: Systems RSM &amp; EWN NAS 120 10:30 a.m.–Noon</td>
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<tr>
<td>Noon</td>
<td>Breakout Session 3D: Inland Resilience Members’ Room 10:30 a.m.–Noon</td>
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<td>12:30 p.m.</td>
<td>Lunch and Exhibits Great Hall Noon–1:00 p.m.</td>
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<td>1:00 p.m.</td>
<td>Plenary 3 Data Requirements for a Next Generation MTS Auditorium 1:45 p.m.–3:30 p.m.</td>
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<td>1:30 p.m.</td>
<td>Breakout Session 4A: Security Lecture Room 4:00 p.m.–5:30 p.m.</td>
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<td>2:00 p.m.</td>
<td>Breakout Session 4B: Environmental Stewardship NAS 125 4:00 p.m.–5:30 p.m.</td>
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<tr>
<td>2:30 p.m.</td>
<td>Breakout Session 4C: Data and Data Management NAS 120 4:00 p.m.–5:30 p.m.</td>
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<tr>
<td>3:00 p.m.</td>
<td>Breakout Session 4D: Resilience Seaports and Climate Members’ Room 4:00 p.m.–5:30 p.m.</td>
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<tr>
<td>3:30 p.m.</td>
<td>Potomac Cruise Excursion Shuttle departs from NAS Building for dock at Diamond Teague Park at 6:30 p.m. sharp!</td>
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<td>4:00 p.m.</td>
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<tr>
<td>8:30 p.m.</td>
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ACKNOWLEDGMENTS

Conference Chair
W. Jeff Lillycrop, U.S. Army Corps of Engineers

Conference Planning Committee
Austin Becker, University of Rhode Island
Helen Brohl, Committee on the Marine Transportation System
Elizabeth Burkhart, Collins Engineering, LLC
Nicole Elko, American Shore & Beach Preservation Authorities
Hota GangaRao, West Virginia University
Sandra Knight, Waterwonks, LLC
Jim Kruse, Texas A&M Transportation Institute
Thomas Leschine, University of Washington
Donald Ludlow, CPCS
Jim McCarville, Port of Pittsburgh Commission
Gerhardt Muller, World Maritime University
Craig Philip, Vanderbilt University
Bill Rogers, Transportation Research Board
Ashley Rose, BCS, Inc.
Anne Strauss-Wieder, Anne Strauss-Wieder, Inc.
Tom Wakeman, Stevens Institute of Technology
Jim Walker, American Association of Port Authorities
Research and Development Integrated Action Team Members

TRB Staff
Scott Brotemarkle, Senior Program Officer
Brittney Gick, Associate Program Officer

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
Welcome to the fourth biennial marine transportation system (MTS) research and development (R&D) conference, “From Sail to Satellite: Delivering Solutions for Tomorrow’s Marine Transportation System,” cosponsored by TRB and the Committee on the Marine Transportation System (CMTS).

Following the great success of the inaugural TRB–CMTS R&D conference, “Transforming the Marine Transportation System: A Vision for Research and Development in 2010,” and the subsequent biennial conferences focused on priority research, we have gathered in the nation’s capital once again to look at current and future marine transportation system challenges and to identify a renewed vision for research and development.

The conference will engage stakeholders in government, academia, and the private sector to examine our next-century MTS and what it might look like, to identify technology innovations that may help us, to consider the data and information requirements to inform decisions, and to look at the progress made since the 2010 biennial conference. The goal of the conference is to identify research priorities and a future course for the MTS community.

We appreciate the involvement of our many prestigious panelists, speakers, and participants. We hope this event provides an excellent opportunity to share your experiences and knowledge and to develop mutually beneficial partnerships and collaborations.

With your participation and involvement, we will create a new research and development vision that we all may use as a community roadmap and catalyst for collaboration.

—W. Jeff Lillycrop
U.S. Army Corps of Engineers
Conference Chair
**SPEAKERS**

### Keynote Speakers

**The Honorable Norman Y. Mineta**  
Past Secretary, U.S. Department of Transportation  
Founder, Mineta Transportation Institute

Norman Y. Mineta is well known for his work in transportation, including aviation, surface transportation, infrastructure, and national security. He is recognized for his accomplishments in economic development, science and technology policy, foreign and domestic trade, and budgetary issues and civil rights, as well as his perspective from having served in Congress for more than 20 years and in the cabinets of Republican and Democratic U.S. presidents.

Mineta served as the chairman of the U.S. House Transportation and Public Works Committee from 1992 to 1994. He was the primary author of the groundbreaking Intermodal Surface Transportation Efficiency Act of 1991. In 2000, Mineta was appointed by President Bill Clinton as the U.S. Secretary of Commerce. From 2001 to 2006, Mineta served as Transportation Secretary under President George W. Bush. Following the terrorist acts of September 11, 2001, Mineta guided the creation of the Transportation Security Administration (TSA).

Since 2006, Mineta has worked as vice chairman at Hill & Knowlton’s Washington, D.C., office. He has received many awards, including the Presidential Medal of Freedom and the Wright Brothers Memorial Trophy. He is a graduate of the University of California, Berkeley.

**The Honorable Manson K. Brown**  
Assistant Secretary of Commerce for Environmental Observation and Prediction  
Deputy Administrator, National Oceanic and Atmospheric Administration  
CMTS Coordinating Board Chair

Vice Admiral Manson K. Brown was sworn in as the Assistant Secretary of Commerce for Environmental Observation and Prediction in March 2015. He strategically drives policy, programming, and investments for all National Oceanic and Atmospheric Administration (NOAA) observing systems and the process of converting observations to predictions for environmental threats related to weather, climate, water, oceans, and space weather. He serves as NOAA Deputy Administrator and chair of NOAA’s Observing Systems Council.

The Washington, D.C., native has served the U.S. Coast Guard for 40 years and has commanded operations at every level, culminating as commander of Pacific Area in San Francisco. Brown’s last assignment on active duty was as Deputy Commandant for Mission Support in Washington, D.C. His other Coast Guard assignments ranged from engineering officer aboard the icebreaker Glacier to Military Assistant to the U.S. Secretary of Transportation. In 2004, he was asked to fill a key leadership gap in Iraq as the Senior Advisor for Transportation for the Coalition Provisional Authority, where he oversaw restoration of Iraq’s transportation systems.

Brown holds master’s degrees in civil engineering, from the University of Illinois at Urbana–Champaign, and in national resources strategy, from the National Defense University.
Panel Speaker

The Honorable Paul N. (Chip) Jaenichen, Sr.
Maritime Administrator

Paul N. (Chip) Jaenichen, Sr., was appointed by President Barack Obama and has served as Maritime Administrator since 25 July 2014. He previously served as both Deputy and Acting Maritime Administrator from July 2012 to July 2014.

Jaenichen retired after 30 years as a nuclear trained submarine officer in the U.S. Navy. His final assignment, from October 2010 to April 2012, was serving as Deputy Chief of Legislative Affairs for the Department of the Navy. He served as commanding officer of the USS Albany from 1999 to 2002 and as commander of Submarine Squadron 11 in San Diego, California, from 2007 to 2008. Jaenichen’s shore tours included assignments as director of Submarine–Nuclear Officer Distribution and as officer-in-charge of Moored Training Ship 635. He also served as chief of the European and North Atlantic Treaty Organization (NATO) Policy Division on the joint staff, and was responsible for military-to-military engagement with all NATO member nations.

Jaenichen’s hometown is Brandenburg, Kentucky. He earned a bachelor’s degree in ocean engineering from the U.S. Naval Academy and a master’s degree in engineering management from Old Dominion University.

Keynote Speakers

William Cassidy
Senior Editor, Journal of Commerce, IHS Maritime & Trade Group

William Cassidy is a senior editor of the Journal of Commerce within the IHS Maritime & Trade Group. He joined IHS in December 2014, when the company acquired JOC Group, a premier provider of U.S. seaborne trade intelligence through data, online content, and events. A former senior editor at JOC Group, Cassidy is a leading expert in trucking, logistics, and supply chain technology issues. His reporting provides readers with insights into key trends that affect their bottom lines and shipping choices, and he frequently speaks at industry events. Cassidy is a graduate of the State University of New York at Oneonta.

General Darren W. McDew
Commander, U.S. Transportation Command, Scott Air Force Base


McDew was commissioned in 1982 after his graduation from Virginia Military Institute. He began his flying career at Loring AFB in Maine and his staff assignments include serving as a member of the U.S. Air Force Chief of Staff Operations Group, as Air Force aide to the President, as chief of the Air Force Senate Liaison Division, and as director of Air Force Public Affairs. McDew served as vice director for strategic plans and policy for the Chairman of the Joint Chiefs of Staff. He also served as the commander of 18th Air Force at Scott AFB and commanded at the squadron, group, and wing levels as well as at an Air Force direct reporting unit.

McDew deployed in support of ongoing operations in Central and Southwest Asia as an air expeditionary group commander and, later, as the director of mobility forces. Before his current assignment, McDew was the commander of the Air Mobility Command at Scott AFB.
COMMITTEE MEETINGS

Monday, June 20

8:00 a.m.–Noon
Standing Committee on Marine Safety and Human Factors (AW040), NAS 125
Standing Committee on Critical Transportation Infrastructure Protection (ABR10), NAS 120

1:00 p.m.–5:00 p.m.
Standing Committee on International Trade and Transportation (AT020), NAS 125
Standing Committee on Military Transportation (AT035), Board Room
Transportation Systems Resilience Section (ABR00), NAS 120

3:00 p.m.–5:00 p.m.
Joint Meeting: Standing Committees on Ports and Channels (AW010), Inland Water Transportation (AW020), and Marine Environment (AW030), Lecture Room

CONFERENCE SESSIONS

Tuesday, June 21

7:30 a.m.–4:30 p.m., Great Hall
Registration

7:30 a.m.–8:30 a.m., Great Hall (seating available in West Court)
Exhibits and Breakfast

8:30 a.m.–10:15 a.m., Auditorium
Opening Session

Call to Order and Conference Overview
Jeff Lillycrop, U.S. Army Corps of Engineers (USACE), Conference Chair

Introduction of Keynote Speakers
Helen Brohl, Committee on the Marine Transportation System

Keynote Address
The Honorable Norman Y. Mineta, 14th U.S. Secretary of Transportation

Keynote Address
The Honorable Manson K. Brown, Assistant Secretary of Commerce for Environmental Observation and Prediction and Deputy Administrator, National Oceanic and Atmospheric Administration (NOAA)

10:15 a.m.–10:45 a.m., Great Hall
Morning Break and Exhibits
10:45 a.m.–12:15 p.m., Auditorium

Plenary 1

Marine Transportation System (MTS) 2100: Our Next-Century Marine Transportation System

Thomas Wakeman, Stevens Institute, presiding

This tone-setting session, which includes thought leaders from the public and private sectors, comprises a moderated conversation that fast-forwards the marine transportation system into the future. What might it look like from the perspectives of infrastructure, capacity, human capital, finance, and public-sector stewardship—and what will it take to get there?

- The Honorable Paul N. (Chip) Jaenichen, Sr., U.S. Maritime Administration (MARAD)
- Walter Kemmsies, JLL Ports Airports and Global Infrastructure
- Page Siplon, Team One Logistics
- Michael Christensen, Port of Long Beach
- Steve Steckler, IMG Rebel, LLC

12:15 p.m.–1:15 p.m., Great Hall (seating available in West Court)

Lunch and Exhibits

1:15 p.m.–2:00 p.m., Auditorium

Keynote Address

Bill Cassidy, Journal of Commerce

From congested ports to inland warehouses and distribution centers, importers and goods shippers have struggled to maintain and improve the velocity of their supply chains and to track shipments as they flow from one transportation mode and location to another. Advances in cellular and satellite machine-to-machine communications and mobile technology are facilitating data gathering and freight tracking, but many vertical data silos of remain unintegrated. A host of new freight-related systems—modeled on Uber and the sharing economy—aim to help make parts of the supply chain more efficient, but how can the whole be connected? What research challenges for the private and public sectors might be represented in the harmonization and analysis of big data from disparate transportation sources?

2:15 p.m.–3:45 p.m.

Breakout Sessions

1A: Future of Navigation, Lecture Room

Jim McCarville, PIANC USA, presiding

Synoptic Risk Assessment for Ship Passage and Hydrographic Uncertainty Representation

Brian Calder, University of New Hampshire


Michael Winkler, Engineer Research and Development Center, USACE


Samuel Greenaway, NOAA Office of Coast Survey

The Next Generation of Precision Navigation: Products and Services to Support Real-Time Decision Making for Coastal Marine Transportation

Neil D. Weston, NOAA Office of Coast Survey
1B: Infrastructure Investment, NAS 125
Craig Philip, Vanderbilt University, presiding

Can Standardized People Transportation Provide the Same Benefits as Standardized Cargo Transportation?  
Hendrik van Hemmen, Martin & Ottaway, Inc.

Land Use and Port Infrastructure: Evaluating the Impact of Road Pricing and Congestion Costs on Port Drayage Markets  
Jonathan Peters, College of Staten Island, The City University of New York

Study of the McClellan–Kerr Arkansas River Navigation System  
Heather Nachtmann, University of Arkansas

Deepwater Expansion in the Gulf of Mexico  
Andrea Nehorayoff, ABS Consulting

1C: Emissions Management, NAS 120  
Ashley Rose, BCS, Inc., presiding

Environmental Performance of Ports: Use of an Emissions Footprint of a Shipping Container as a Metric  
Christina Wolfe, Environmental Defense Fund

Innovation for Maritime Environmental Stewardship: The Maritime Environmental and Technical Assistance Program  
John Quinn, MARAD

Safety, Security, and Sustainability of the Maritime Supply Chain  
Anuj Chopra, RightShip

Shore Power at Ports  
Arman Tanman, U.S. Environmental Protection Agency

1D: Resilience—Tools and Needs, Members’ Room  
Julie Rosati, USACE, presiding

Chesapeake Bay Human Scale Vulnerability: Prediction and Evaluation  
Alexander Renaud, Coastal and Hydraulics Laboratory, Engineer Research and Development Center, USACE

Inspiring Transformational Thinking for Maritime Systems Resilience: Port of Providence, Rhode Island, Demonstration Project  
Austin Becker, University of Rhode Island

Regional Sediment Management (RSM) Optimization Pilot  
Clay McCoy, USACE

1E: Innovative Materials, Part 1, Board Room  
Hota Gangarao, West Virginia University, presiding

Advanced Fiber-Reinforced Polymer (FRP) Composites for Corrosion Mitigation in Waterway Infrastructure  
Ruifeng Liang, National Science Foundation Center for Integration of Composites into Infrastructure
FRP Composites for Corps of Engineers Hydraulic Structures
John Clarkson, USACE

Glass Fiber–Reinforced Polymer (GFRP) Composite Wicket Gates for Chanoine Type Wicket Dams
Jonathan Trovillion, Engineer Research and Development Center, USACE, and Construction Engineering Research Laboratory

3:45 p.m.–4:15 p.m., Great Hall
Afternoon Break and Exhibits

4:15 p.m.–5:45 p.m.
Breakout Sessions

2A: MTS Performance Measures, Part 1, Lecture Room
Mihalis Gkolias, University of Memphis, presiding

Assessing the Risks of Collision and Grounding in U.S. Coastal Ports Using Automatic Information System Data
Martin Schultz, Engineer Research and Development Center, USACE

Inland Navigational Locks Travel Delay
Patricia DiJoseph, Engineer Research and Development Center, USACE

Using Historical Data to Quantify Regional Shipping Disruptions from Potential Shoaling
Marin Kress, USACE

2015 West Coast Port Slowdown: Using AIS and Geographic Information Systems to Analyze Container Ship Dwell Times
Jonathan Hsieh, MARAD

2B: Innovative Technologies, Part 1, NAS 125
Sergio Perez, U.S. Merchant Marine Academy, presiding

A Study of Absorption Chiller–Heater Application in Marine Engineering
Yongjian Gu, U.S. Merchant Marine Academy

Sub Chapter M: How U.S. Coast Guard Rulemaking Spawned MTS Innovative Technologies
Dean Shoultz, MarineCFO

Improved Effectiveness of Corrosion Prevention and Control Systems for Hydraulic Steel Structures
Thomas Carlson, USACE

Composite Material in U.S. Coast Guard Aids to Navigation
Jon Benvenuto, U.S. Coast Guard

2C: Asset Management, NAS 120
Kenneth (Ned) Mitchell, USACE, presiding

Analysis of Multiyear Benefit Window on Dredge Location Selection
Corey Winton, USACE

NCHRP’s Foresight Series: Informing Transportation’s Future
Mell Henderson, Mid-America Regional Council
Strategic Asset Management: Opportunities and Constraints in the North American Port Industry
Erik Stromberg, Center for Port Management, Lamar University

Structural Health Monitoring for USACE Operations and Asset Management
Matthew Smith, Coastal and Hydraulics Laboratory, Engineer Research and Development Center, USACE

2D: Arctic Marine Transportation, Members’ Room
Patricia Mutschler, Committee on the Marine Transportation System, presiding

Arctic Maritime Activity and the Black Carbon Issue: Why It Matters and the Gaps Creating Uncertainty
Alyson Azzara, Committee on the Marine Transportation System

Development of a U.S. Arctic Risk Management Framework
Brandon Lee, ABS Consulting

Governing Maritime Transportation in the Arctic
Supriti Jaya Ghosh, Committee on the Marine Transportation System

Susan Hazlett, Maine Maritime Academy

2E: Innovative Materials, Part 2, Board Room
Eddie Wiggins, USACE, presiding

Rehabilitation of East Lynn Lake Bridge with FRP Composites
Hota Gangarao, West Virginia University

GFRP Composite Miter Blocks
Jonathan Trovillion, Engineer Research and Development Center, USACE, and Construction Engineering Research Laboratory

GFRP Composite Recess Protection Panels
PV Vijay, West Virginia University

5:45 p.m.–7:00 p.m., Great Hall (seating available in West Court)
Reception
Wednesday, June 22

7:30 a.m.–4:30 p.m., Great Hall
Registration

7:30 a.m.–8:30 a.m., Great Hall (seating available in West Court)
Exhibits and Breakfast

8:30 a.m.–10:00 a.m., Auditorium
Plenary 2
Technology Innovations for a Next-Generation MTS
Jim Kruse, Texas A&M Transportation Institute (TTI), presiding

New situational awareness platforms, big data analytics, sensor technologies, automation, and energy innovations are just a few of the many drivers affecting the marine transportation system now and in the future. This session will provide some insights from leading-edge enablers in the areas of automation, navigation, alternative energy, and infrastructure. Concepts that the panelists will address include obstacles related to their areas of innovation, next steps in maintaining progress, and the partnerships and catalysts necessary to fully realize the promise of these innovations.

E-Navigation Infrastructure Technologies
Brian Tetreault, Navigation Systems Specialist, USACE

Hydrogen Fuel Cell Energy Technology for Ferries
Thomas Escher, Red and White Fleet, and Lennie Klebanoff, Sandia National Laboratories

Structural Health Monitoring of Infrastructure
Michael Todd, University of California, San Diego

10:00 a.m.–10:30 a.m., Great Hall
Morning Break and Exhibits

10:30 a.m.–Noon
Breakout Sessions

3A: MTS Performance Measures, Part 2, Lecture Room
Jim Kruse, TTI, presiding

Connecting Ports with U.S. Customs Entrances and Clearances Data
Patricia DiJoseph, Engineer Research and Development Center, USACE

Estimating Vessel Under-Keel Clearance from AIS Data
Brandan Scully, USACE

Evolution of Emission Inventories as Strategic Management Tools for Ports
Marcelo Norsworthy, Environmental Defense Fund

Port Performance Measures for the Megaship Era
Frank Harder, The Tioga Group, Inc.
3B: Innovative Technologies, Part 2, NAS 125
Jon Benvenuto, U.S. Coast Guard, presiding

Automating Measurement Process to Improve Inspection of Marine and Offshore Equipment and Facilities
Mahdi Safa, Lamar University

Efficiency of Sail Pumping and Applicability to Merchant Ships
Sergio Perez, U.S. Merchant Marine Academy

Remote Sensing for the Marine Transportation System
Jennifer Wozencraft, Joint Airborne Lidar Bathymetry Technical Center of Expertise, USACE

Simultaneous Lidar, Multibeam Sonar, and Photo Survey of Marine Structures from an Unmanned Surface Vessel
Jonathan Marshall, Coastal and Hydraulics Laboratory, USACE

3C: Systems Management RSM and EWN, NAS 120
Linda Lillycrop and Todd Bridges, USACE, presiding

Balancing Benefits and Impacts at the Mouth of the Columbia River
Jarod Norton, USACE

Reestablishment of In-Bay Placement Associated with Mobile Harbor Federal Navigation Project
Nathan Lovelace, USACE

Sustaining the Marine Transportation System Through RSM and Engineering with Nature
Linda Lillycrop, Coastal and Hydraulics Laboratory, Engineer Research and Development Center, USACE

Using Strategic Placement of Dredged Material to Develop Sustainable Navigation Solutions and River Island Habitat
Burton Suedel, Engineer Research and Development Center, USACE

3D: Inland Resilience, Members’ Room
Elizabeth Burkhart, Collins Engineers, Inc., presiding

Building Institutional and Social Resilience as a Response to Maritime Infrastructure Fragility
Craig Philip, Vanderbilt University

Supporting Secure and Resilient Inland Waterways
Heather Nachtmann, University of Arkansas

The Perils of Efficiency: An Analysis of an Unexpected Closure of the Poe Lock and Its Impact
Craig Gordon, U.S. Department of Homeland Security

Noon–1:00 p.m., Great Hall (seating available in West Court)
Lunch and Exhibits
1:00 p.m.–1:45 p.m., Auditorium
Keynote Address
General Darren McDew, Commander, U.S. Transportation Command, U.S. Air Force

From natural disasters to epidemics to acts of war, when things go wrong in an increasingly complex and uncertain world, the U.S. Transportation Command always answers America’s call to deliver national objectives anywhere and at any time. General McDew will discuss the challenges faced by the global combatant command in maintaining the readiness of the country’s strategic sealift capability, both commercial and organic, as well as in operating in a contested cyber domain.

1:45 p.m.–3:30 p.m., Auditorium
Plenary 3
Data Requirements for a Next-Generation MTS
Jim Walker, American Association of Port Authorities, presiding

Big data can result in everything from a real-time stream of information for informing acute operational decisions to an amalgamated visualization that informs big picture priorities. It can also be an overwhelming mass that can be costly to collect and yield minimal benefits. This session will examine questions associated with future data for decisions applications: What will the data requirements and useful outputs look like for a best case scenario next generation marine transportation system and what are the gaps and research needs to reaching big data nirvana?

- Commercial User Perspective, Resilience, and Safety Data
  Craig Philip, Vanderbilt University

- USACE Data Programs
  Kenneth (Ned) Mitchell, USACE

- Data Visualization Analytics Applications in Freight Transportation
  Michael Pack, University of Maryland

- Integrating Public–Private Inland Port and Waterway Information
  Jonathan Corey, University of Cincinnati

- Best Practices in Data Sharing Through Port Authorities
  Rich Roche, Mohawk Global Logistics

3:30 p.m.–4:00 p.m., Great Hall
Afternoon Break and Exhibits

4:00 p.m.–5:30 p.m.
Breakout Sessions

4A: Security, Lecture Room
Todd Ripley, MARAD, presiding

- Risk Basing Maritime Security Response Operations for the U.S. Coast Guard
  Jeff Kuck, ABS Consulting

- Strategies for Developing Risk-Based Performance Standards in the MTS: Lessons Learned from the Chemical Facility Anti-Terrorism Standards
  Kimberly Young-McLear, U.S. Coast Guard Academy

- Marine Transportation System Security
  Dean Schoultz, MarineCFO
4B: Environmental Stewardship, NAS 125
Alyson Azzara, Committee on the Marine Transportation System, presiding

- **Alternative Fuels: Opportunities for Meeting Low-Sulfur Targets**
  Scott Eaton, Maine Maritime Academy

- **Geosensing Ship Activity to Estimate Invasive Species Risk**
  James Corbett, University of Delaware

- **Making Sound Infrastructure Investments: Increasing Value on Great Lakes Breakwaters Through the USACE Engineering with Nature Initiative**
  Burton Suedel, Engineer Research and Development Center, USACE

- **Optimal Dredge Fleet Scheduling within Environmental Work Windows**
  Kenneth (Ned) Mitchell, USACE

4C: Data and Data Management, NAS 120
Doug McDonald, MARAD, presiding

- **Commercial Marine Transportation and Ocean Use: Data Needs for Multidisciplinary Long-Term Planning**
  Matthew Campo, Rutgers University

- **Creating an AIS Transmit Architecture: Lessons Learned, Requirements Identified, and Research Needed**
  Brian Tetreault, USACE

- **Maritime Data Program at MARAD: Using Open Data and Open-Source Software to Determine Container Ship Trends in U.S. Ports**
  Jonathan Hsieh, MARAD

4D: Resilience—Seaports and Climate, Members’ Room
Austin Becker, University of Rhode Island, presiding

- **Marine Transportation System Resilience Factors: A Federal Agency Perspective**
  Katherine Touzinsky, Coastal and Hydraulics Laboratory, USACE

- **MTS System Performance Data Sources to Support Resilience Evaluations**
  Marin Kress, USACE

- **Toward a Comparative Index of Seaport Climate Risk: Indicator Development from Open Data**
  Robert McIntosh, University of Rhode Island

6:30 p.m.–9:30 p.m.
**Potomac Cruise Excursion**

Join us aboard the Potomac Riverboat Company’s *Miss Christin* on Wednesday evening for a cruise down the Potomac River. There will be light refreshments and a cash bar. A shuttle will be provided from and returning to the National Academy of Sciences building. Shuttle will depart at 6:30 from the east side of the building, at the parking lot circle.

- **Cruise**: 7:00 p.m.–9:00 p.m.
- **Vessel Boarding**: 6:45 p.m.
- **Shuttle Pickup and Dropoff**: National Academy of Sciences Building, 2101 Constitution Avenue NW, Washington D.C. 20418
- **Cruise Departure Site**: Diamond Teague Park at the Nationals Stadium, 100 Potomac Avenue SE; Washington, D.C. 20003
- **Nearest Metro Station**: Navy Yard–Ballpark
- **Cost**: $55 per person; option to purchase during registration based on availability. Please limit to one guest per person.
Thursday, June 23

7:30 a.m.–8:30 a.m., Great Hall
Exhibits and Breakfast

8:30 a.m.–9:30 a.m., Auditorium
Student Honor Panel
Helen Brohl, Committee on the Marine Transportation System, presiding

This special session features the work of four student researchers on topics related to this conference’s call for presentations. This opportunity was made available to full-time students age 35 or younger. Abstracts were reviewed and chosen based on their quality and relevance to the conference topics. Winning presenters received a $500 travel stipend to attend the conference and received complimentary registration.

- **A Navigable Inland Waterway Traffic Model for Evaluation of Tow Operation Procedures During Extreme Weather Events**
  Katherine Nelson, Vanderbilt University

- **Coatings for Navigational Steel Structures**
  Piyush Soti, University of West Virginia

- **Leadership, Responsibility, and Incentive for Long-Term Hurricane Resilience: Stakeholder Perceptions at the Port of Providence**
  Eric Kretsch, University of Rhode Island

- **The Ports Resilience Index: A Qualitative Resilience Assessment Tool for the Gulf Coast**
  Lauren Morris, Louisiana State University

10:00 a.m.–Noon, Lecture Room
Closing Session: Conference Integration and Future Directions for MTS Research and Development
Sandra Knight, Water Wonks LLC, and Jeff Lillycrop, USACE, presiding

This session will bring forward the main concepts, research needs and gaps, and lessons learned for MTS research and development future activity. This arguably is the most important session of the conference, as the results of these conversations will directly affect the agendas of the agencies and stakeholders responsible for the stewardship of America's future marine transportation system.
16th Biennial Harbor Safety Committee Conference


September 13–15, 2016
Portland, Oregon

Organized by
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For more information, please visit the conference website:
www.trb.org/conferences/HSC2016.aspx
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