



FINAL PROGRAM



**Diagnosing the Marine Transportation System:
Measuring Performance and Targeting Improvement**
Biennial Research and Development Conference

June 26-28, 2012
National Academy of Sciences
2101 Constitution Avenue, NW
Washington, D.C. 20418

Organized by
Transportation Research Board

Cosponsored by
Committee on the Marine Transportation System

www.TRB.org/Conferences/Metrics2012.aspx

ACKNOWLEDGMENTS

This conference would not have been possible without the combined efforts of many individuals and agencies. Special acknowledgment is given to the members of the Committee on the Marine Transportation System Research and Development Integrated Action Team along with the Organizing Committee.

Conference Chair

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

Conference Planning Committee Members

Russ Byington, U.S. Maritime Administration

Scott Drumm, Port of Portland

Greg Edwards, Virginia Port Authority

Dale Heller, Ingram Barge

Bruce Lambert, Institute for Trade and Transportation Studies

Jim McCarville, Port of Pittsburgh Commission

K. Ned Mitchell, U.S. Army Corps of Engineers

Roy Pearson, Federal Maritime Commission

Ted Prince, Ted Prince and Associates, LLC

Randolph Resor, Office of the Secretary of Transportation

William Rogers, Transportation Research Board

CDR Aaron Sanders, U.S. Coast Guard

Edward Strocko, Federal Highway Administration

Marc Thibault, U.S. Coast Guard

Thomas Wakeman, Stevens Institute of Technology

Research and Development Integrated Action Team Members and Other Contributors

Alyson Azzara, Committee on the Marine Transportation System

LCDR Charles Bright, U.S. Coast Guard

Helen Brohl, Committee on the Marine Transportation System

Marvourneen Dolor, St. Lawrence Seaway Development Corporation

Dave Enabnit, National Oceanic and Atmospheric Administration

Mary Erickson, National Oceanic and Atmospheric Administration

Wayne Estabrooks, U.S. Navy

MJ Fiocco, U.S. Department of Transportation

Robert Henry, National Transportation Safety Board

Michael Hilliard, Oak Ridge National Laboratory

John Humphrey, National Oceanic and Atmospheric Administration

Rajiv Khandpur, U.S. Coast Guard

Gary Magnuson, National Oceanic and Atmospheric Administration

CAPT David McFarland, National Oceanic and Atmospheric Administration

Patricia Mutschler, Committee on the Marine Transportation System/U.S. Army Corps of Engineers

Todd Ripley, U.S. Department of Transportation Maritime Administration

Emily Vuxton, U.S. Army Corps of Engineers

TRB Staff

Joedy Cambridge

Jaclyn Hubersberger

Special Thanks to:
Ingram Barge Company
for Hosting and Sponsoring the Wednesday Evening Reception

WELCOME



Welcome to the biennial MTS R&D conference, *Diagnosing the Marine Transportation System: Measuring Performance and Targeting Improvement*, cosponsored by the Committee on the Marine Transportation System (CMTS), the Transportation Research Board (TRB), and the Marine Board of the National Academies.

Following the great success of the 2010 MTS R&D conference, *Transforming the Marine Transportation System: A Vision for Research and Development*, in 2010 in Irvine, California, we have gathered here in Washington, D.C. to address one of the key research requirements identified at the 2010 conference—the need for performance indicators in the Nation’s marine transportation system (MTS).

The conference will engage stakeholders in government, academia, and the private sector to examine the use of performance indicators in maritime transportation and waterways management. The goal of the conference is to identify indicators that fully consider the MTS in the context of the overall supply chain. Conference participants will explore how the MTS and multimodal connectors perform through the application of performance metrics.

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

With your participation and involvement, we will create performance indicators for the MTS that will help us measure and ultimately create a more sustainable and successful MTS.

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

TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES

The **Transportation Research Board** is one of six major divisions of the National Research Council, which serves as an independent adviser to the federal government and others on scientific and technical questions of national importance. The National Research Council is jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The mission of the Transportation Research Board is to provide 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 activities 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

CMTS COORDINATING BOARD CHAIR



Margaret Spring

Chief of Staff, National Oceanic and Atmospheric Administration (NOAA)
U.S. Department of Commerce

Margaret Spring, a graduate of Duke University School of Law and Dartmouth College, joined the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce, in June of 2009. In her capacity as Chief of Staff, she reports directly to NOAA Administrator Dr. Jane Lubchenco and serves as the chief advisor on policy, personnel and budget matters in the Office of the Under Secretary. Margaret works with the Administrator, NOAA senior leadership and the Department of Commerce to help integrate policy and budget priorities and align programs in support of the NOAA priorities and budget.

Margaret joined The Nature Conservancy's California chapter in May 2007 as Director of its Coastal and Marine Program, where she managed and directed one of the largest U.S. marine programs at the Conservancy, focused on scalable, innovative projects designed to address the major threats to coastal and marine biodiversity and related ecosystems.

Prior to joining the Conservancy she served as Senior Counsel, then General Counsel, to the Senate Committee on Commerce, Science, and Transportation. Her areas of responsibility included: fisheries conservation and management; coastal zone management; marine sanctuaries; coastal and atmospheric science; climate change; weather; satellite systems; mapping, and other federal ocean and atmospheric programs.

Margaret's legislative work included enactment of the Oceans Act of 2000, the Oceans and Human Health Act, the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006, the Marine Debris Research, Prevention, and Reduction Act, and the Tsunami Warning and Education Act.

From 1992 to 1999, Margaret was an environmental attorney at Sidley & Austin in Washington, D.C.



KEYNOTE SPEAKER



Polly Trottenberg

Acting Under Secretary and Assistant Secretary for Transportation Policy
U.S. Department of Transportation

Ms. Trottenberg is currently serving as the Acting Under Secretary, and the Assistant Secretary for Transportation Policy at the U.S. Department of Transportation. Her office focuses on surface transportation reauthorization, livability, high-speed rail, the TIGER program and freight policy development. She oversees the offices of Infrastructure Finance and Innovation, Safety, Energy and the Environment, and Economic and Strategic Analysis.

She was previously the Executive Director of Building America's Future, a non-profit organization created by former Pennsylvania Governor Edward Rendell, former California Governor Arnold Schwarzenegger, and New York Mayor Michael R. Bloomberg, to promote infrastructure investment.

Ms. Trottenberg also worked in the United States Senate for 12 years, most recently as Deputy Chief of Staff and Legislative Director for California Senator Barbara Boxer, Chairman of the Senate Environment and Public Works Committee. Ms. Trottenberg also served as Legislative Director for New York Senator Charles Schumer and as Legislative Assistant to New York Senator Daniel Patrick Moynihan. She has worked extensively on transportation, public works, energy and environmental issues during her congressional career.

Before starting her career on Capitol Hill, Ms. Trottenberg worked at the Port Authority of New York and New Jersey, the Massachusetts State Senate, and the Massachusetts Port Authority.

Ms. Trottenberg received her undergraduate degree from Barnard College and her Master's in Public Policy from the Kennedy School of Government.

KEYNOTE SPEAKER



Major General Michael J. Walsh

Deputy Commanding General, Civil and Emergency Operations
United States Army Corps of Engineers

Major General Michael J. Walsh has been the Deputy Commanding General for Civil and Emergency Operations, United States Army Corps of Engineers since December 2011. General Walsh is responsible for a \$10 billion program. He exercises supervision over civil works activities of 8 engineer divisions and 38 districts nationwide employing 294 officers and 23,033 civilian employees who operate and maintain civil infrastructure valued at \$125 billion, including more than 693 dams, 4,254 recreation areas, over 12,000 miles of commercial inland waterways, and 926 harbors. He serves as principal advisor to the Chief of Engineers and the Assistant Secretary of the Army for Civil Works and directly interfaces with members of Congress on civil works issues and programs. Major General Walsh is responsible for emergency response missions for civil disasters and Federal Emergency Management Agency (FEMA) support.

Previous assignments include: Commander of the Mississippi Valley Division, Vicksburg, Mississippi, from February 2008 to November 2011; Commander of the South Atlantic Division, Atlanta, Georgia, from June 2004 to September 2006; Chief of Staff at headquarters, Washington, D.C., from May 2003 to June 2004; Executive Director of Civil Works at headquarters, Washington, D.C., from August 2001 to May 2003; District Commander of the Sacramento District, Sacramento, California, from 1998 to 2001; and District Commander of the San Francisco District, San Francisco, California, from 1994 to 1996. His awards include a Distinguished Service Medal, two Bronze Stars, four Legions of Merit, and numerous other awards.

Major General Walsh earned a master's degree in construction management from the University of Florida. He graduated from Polytechnic Institute of New York in 1977 with a bachelor's degree in civil engineering. His military education includes the Engineer Officers Basic and Advanced Courses, U.S. Army Command and General Staff College, and the U.S. Army War College.



CONFERENCE AT A GLANCE

	Tuesday, June 26, 2012		Wednesday, June 27, 2012		Thursday, June 28, 2012
7:30 AM	Breakfast and Exhibits <i>Great Hall, 7:30 a.m. - 8:30 a.m.</i>	Registration 7:30 a.m. - 4:00 p.m.	Breakfast and Exhibits <i>Great Hall, 7:30 a.m. - 8:30 a.m.</i>	Registration 7:30 a.m. - 4:00 p.m.	Breakfast and Exhibits <i>Great Hall, 7:30 a.m. - 8:30 a.m.</i>
8:00 AM					
8:30 AM	Morning Break and Exhibits <i>Great Hall, 10:15 a.m. - 10:45 a.m.</i>		Morning Break and Exhibits <i>Great Hall, 10:30 a.m. - 11:00 a.m.</i>		Closing Session <i>Auditorium, 9:00 a.m. - noon</i>
9:00 AM					
9:30 AM	Evaluating the Return on Infrastructure Investments <i>Auditorium, 12:15 p.m. - 12:45 p.m.</i>		Lunch <i>Great Hall, 12:30 p.m. - 1:30 p.m.</i>		
10:00 AM					
10:30 AM	TRB Marine Group (AW000) Meeting <i>Board Room, 1:00 p.m. - 2:00 p.m.</i>		Carriers, Users and Marketplace Dynamics <i>Auditorium, 2:00 p.m. - 4:00 p.m.</i>		
11:00 AM					
11:30 AM	Breakout Sessions 2A-2D <i>Rooms 118, 120, 250, 280 4:00 p.m. - 5:30 p.m.</i>		Reception and Exhibits <i>Great Hall, 4:00 p.m. - 5:30 p.m.</i>		
12:00 PM					Reception and Exhibits <i>Great Hall, 4:00 p.m. - 5:30 p.m.</i>
12:30 PM	Reception and Exhibits <i>Great Hall, 4:00 p.m. - 5:30 p.m.</i>				
1:00 PM			Reception and Exhibits <i>Great Hall, 4:00 p.m. - 5:30 p.m.</i>		
1:30 PM	Reception and Exhibits <i>Great Hall, 4:00 p.m. - 5:30 p.m.</i>				
2:00 PM		Reception and Exhibits <i>Great Hall, 4:00 p.m. - 5:30 p.m.</i>			
2:30 PM	Reception and Exhibits <i>Great Hall, 4:00 p.m. - 5:30 p.m.</i>				
3:00 PM		Reception and Exhibits <i>Great Hall, 4:00 p.m. - 5:30 p.m.</i>			
3:30 PM	Reception and Exhibits <i>Great Hall, 4:00 p.m. - 5:30 p.m.</i>				
4:00 PM		Reception and Exhibits <i>Great Hall, 4:00 p.m. - 5:30 p.m.</i>			
4:30 PM	Reception and Exhibits <i>Great Hall, 4:00 p.m. - 5:30 p.m.</i>				
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5:30 PM	Reception and Exhibits <i>Great Hall, 4:00 p.m. - 5:30 p.m.</i>				

EXHIBITORS

PortVision

U.S. Army Corps of Engineers

CONFERENCE SESSIONS

Tuesday, June 26

7:30 a.m. – 4:00 p.m.

Registration

7:30 a.m. – 8:30 a.m., *Great Hall*

Exhibits and Breakfast

8:30 a.m. – 10:15 a.m., *Auditorium*

Opening Session

Welcome and Call to Order

W. Jeff Lillycrop, U.S. Army Corps of Engineers/Committee on the Marine Transportation System
R&D Integrated Action Team

Conference Overview and Introduction of Keynote Speakers

Margaret Spring, NOAA Chief of Staff/CMTS Coordinating Board Chair, *presiding*

National Freight Policy

Polly Trottenberg, Acting Under Secretary, U.S. Department of Transportation

An Integrated Transportation System

Major General Michael J. Walsh, Deputy Commanding General, Civil and Emergency
Operations, U.S. Army Corps of Engineers

10:15 a.m. – 10:45 a.m., *Great Hall*

Morning Break and Exhibits

10:45 a.m. – 12:15 p.m., *Auditorium*

Highway, Railroad, and Waterway Performance Indicators

Edward Strocko, Federal Highway Administration, *presiding*

Sean Connaughton, American Association of State Highway Transportation Officials

[John Gray, Association of American Railroads](#)

Matt Woodruff, Kirby Corporation

[Jim Walker, U.S. Army Corps of Engineers](#)

12:15 p.m. – 12:45 p.m., *Auditorium*

Evaluating the Return on Infrastructure Investments

Vijay Perincherry, HDR Decision Economics

12:45 p.m. – 2:00 p.m., *Great Hall and West Court*

Lunch

2:00 p.m. – 3:30 p.m.

Breakout Sessions

Measuring Performance

1A: Capacity, Room 118

Diane Davidson, Oak Ridge National Laboratory, *presiding*

[Measuring the Effect of a Lack of Maintenance Dredging of Ship Channels](#)

C. James Kruse, Texas Transportation Institute

[Container Port Capacity and Productivity Metrics](#)

Daniel Smith and Frank Harder, The Tioga Group, Inc.

[Baseline Analytics and Automated Reporting Drive Optimal Decision Making in the Maritime Transportation System](#)

Jason Tieman, PortVision

1B: Energy and Environment, Room 120

Patricia Mutschler, Committee on the Marine Transportation System/U.S. Army Corps of Engineers, *presiding*

[Modal Comparison of Domestic Freight Transportation Effects on the General Public: 2001-2009](#)

Annie Protopapas, C. James Kruse, and Leslie E. Olson, Texas Transportation Institute

[A PIANC Standard of Practice for Performing Initial Assessments of Environmental Effects for Navigation Infrastructure Projects](#)

Burton C. Suedel, Edmond J. Russo, Todd S. Bridges, and Sandra M. Brasfield, U.S. Army Corps of Engineers

[Effects of Energy Efficiency Design Index on the Marine Transportation System](#)

William Hockberger, Consultant

1C: Resilience and Reliability, Room 250

Scott Rainey, Committee on the Marine Transportation System, *presiding*

[Marine System Performance: Implications of Flow Reliability for Waterways Market Development and Industry Sustainability](#)

Ernie Perry and Teresa Adams, University of Wisconsin – Madison

[Navigation Strategic Vision's Contribution to Performance Metrics](#)

James E. Clausner, U.S. Army Corps of Engineers (retired)

[National Dredging Quality Management Program Presentation](#)

Vern Gwin, U.S. Army Corps of Engineers

[Existing Marine Transportation Performance Metrics in the Federal Government and Industry](#)

Emily Vuxton, U.S. Army Corps of Engineers

1D: Investment, Economics, and Jobs, Room 280

Mary Erickson, National Oceanic and Atmospheric Administration, *presiding*

[Financing the Future: Financial Performance, Modernization and Funding Options for the Port Authority's Staten Island Bridges](#)

Thomas Brigandi and Jonathan Peters, City University of New York

[American Marine Highway Modeling Toolset](#)

Jacek Kawecki, CSC Advanced Marine Center

[Navigation Investment Model: Challenges in Measuring Economic Benefits](#)

Ingrid K. Busch and Michael R. Hilliard, Oak Ridge National Laboratory

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

4:00 p.m. – 5:30 p.m.
Breakout Sessions

Targeting Improvement

2A: Capacity, Room 118

Diane Davidson, Oak Ridge National Laboratory, *presiding*

[History of the Automatic Identification System and Future Improvements in Waterway Management](#)

Brandan Scully and Kenneth Ned Mitchell, U.S. Army Corps of Engineers

[Combination Marine Highway System \(CMH\) for Avoiding Recurring Congestion Bottlenecks](#)

K. T. Thirumalai and Michael S. Bronzini, George Mason University

[Quantifying the Impacts of Shoaling in Navigation Channels via Historical Waterborne Commerce Data](#)

Kenneth Ned Mitchell, U.S. Army Corps of Engineers and Captain David MacFarland, National Oceanic and Atmospheric Administration

[Marine Highway Transport of Toxic Inhalation Hazard \(TIH\) Materials](#)

Annie Protopapas, C. James Kruse, Leslie E. Olson, Mike Donelan, and Nathan Hutson, Texas Transportation Institute

2B: Safety and Security, Room 120

Robert Henry, National Transportation Safety Board, *presiding*

[Measuring the Safety and Security of the Marine Transportation System: A Coast Guard Perspective](#)

CDR Aaron Sanders, U.S. Coast Guard

[Geospatial Tool for Assessing the Importance of Marine Waterways](#)

Shih-Miao Chin, Ho-Ling Hwang, and Francisco Moraes de Oliveira-Neto, Oak Ridge National Laboratory

[e-Navigation and Practical Applications](#)

Brian Tetreault, U.S. Army Corps of Engineers

2C: Resilience and Reliability, Room 250

Scott Rainey, Committee on the Marine Transportation System, *presiding*

[Measuring Port Effectiveness in User Service Delivery](#)

Mary R. Brooks and Tony Schellinck, Dalhousie University

Port Commerce and Urban Land Use: Economic Competitiveness in the 21st Century

Adam Davidson, Jonathan Peters, and Rich Flanagan, City University of New York;
Cameron Gordon, University of Canberra

Assessing the Feasibility of Inland Waterway Emergency Services

Heather Nachtmann and Edward A. Pohl, University of Arkansas

Improved Resource Allocation for Dredge Scheduling and Procurement

Heather Nachtmann, Edward A. Pohl, and Chase E. Rainwater, University of Arkansas;
Kenneth Ned Mitchell, U.S. Army Corps of Engineers

2D: Investment, Economics, and Jobs, Room 280

Mary Erickson, National Oceanic and Atmospheric Administration, *presiding*

New Approaches for Lock and Dam Maintenance Funding

C. James Kruse and Annie Protopapas, Texas Transportation Institute

Ultimate Economic Measures of Performance

William Hockberger, Consultant

Measuring a Port's Performance Using the Economic Value of Commodities

Zamira Simkins and Richard Stewart, University of Wisconsin-Superior

Exploring New Metrics for Inland Waterways

Jim McCarville, Port of Pittsburgh

Wednesday, June 27

7:30 a.m. – 4:00 p.m.

Registration

7:30 a.m. – 8:30 a.m., *Great Hall*

Exhibits and Breakfast

8:30 a.m. – 10:30 a.m., *Auditorium*

Gateways and Intermodal Connection Performance Indicators

Jean Godwin, American Association of Port Authorities, *presiding*

[CDR Aaron Sanders, U.S. Coast Guard](#)

[Buff Byington, U.S. Department of Transportation Maritime Administration](#)

[Jim McCarville, Port of Pittsburgh](#)

[Greg Edwards, Virginia Port Authority](#)

10:30 a.m. – 11:00 a.m., *Great Hall*

Morning Break and Exhibits

11:00 a.m. – 12:30 p.m.

Breakout Sessions

Marine Transportation System Integration

3A: Supply Chain Interdependencies, Room 118

Randolph Resor, Office of the Secretary of Transportation, *presiding*

[Concordance of Maritime Performance Measures for Deepwater, Waterway, and Landside Systems](#)

Nathan Hutson and Sophie Hartshorn, Cambridge Systematics, Inc.

[Operations and Maintenance Funding Allocation via Navigation Systems Optimization](#)

Kenneth Ned Mitchell, U.S. Army Corps of Engineers; and Adel Khodakarami and Bruce Wang, Texas A&M University

[Using Performance Management to “Anchor” the Marine Transportation System and to Facilitate “Managing and Messaging” Performance](#)

Elizabeth Davenport, National Oceanic and Atmospheric Administration

[Validation and Integration of Waterway Flows in the Freight Analysis Framework with the Waterborne Commerce of the United States](#)

Shih-Miao Chin, Moraes Oliveira-Neto, and Ho-Ling Hwang, Oak Ridge National Laboratory

3B: Data Framework, Room 120

Emily Vuxton, U.S. Army Corps of Engineers, *presiding*

[Maritime Data and Statistics Support the National Export Initiative](#)

Matthew Chambers and Mindy Liu, U.S. Department of Transportation

[Information Sharing and Communication through the Marine Transportation System Data Portal](#)

Alyson Azzara, Committee on the Marine Transportation System

[Supporting Secure and Resilient Inland Waterways: Data Frameworks to Improve Emergency Decision Making Capabilities](#)

Henry Mayer, Matt Campo, and Jennifer Rovito, Rutgers University; Heather Nachtmann and Letitia Pohl, University of Arkansas

[Federal-Industry Logistics Standardization \(FILS\): Supporting a Federal Navigation Information Framework and Integration](#)

Douglas McDonald, U.S. Army Corps of Engineers

3C: Asset Management / Risk Management, Room 250

Charles E. Wiggins, U.S. Army Corps of Engineers, *presiding*

[Asset Management Process for Coastal Navigation Structures](#)

George Domurat, U.S. Army Corps of Engineers

[Characterizing Risk in the Global Supply Chain](#)

Steven S. Streetman, U.S. Department of Homeland Security; Christopher Toms, and CDR Aaron Sanders, U.S. Coast Guard

[Modeling the Effect of Sea-Level Rise on Risks to Coastal Infrastructure Using Bayesian Networks](#)

Martin T. Schultz and Edmond J. Russo, U.S. Army Corps of Engineers

3D: Future and Emerging Capabilities, Room 280

CAPT David McFarland, National Oceanic and Atmospheric Administration, *presiding*

[Port Tomorrow: Envisioning a Resilient Future for Port Communities](#)

Joshua H. Murphy, National Oceanic and Atmospheric Administration

[Mobile Devices for Data Collection: Coastal Structure Inspections](#)

James Stinson and Eric Roth, U.S. Army Corps of Engineers

[Performance Measurement for Maritime Systems and Beyond](#)

Patrick T. Hester and Thomas J. Meyers, Old Dominion University

12:30 p.m. – 1:30 p.m., *Great Hall*

Lunch

1:30 p.m. – 2:00 p.m., *Auditorium*

[Challenges Measuring the Security and Resiliency of the Marine Transportation System](#)

Stephen Caldwell, U.S. Government Accountability Office

2:00 p.m. – 4:00 p.m., *Auditorium*

[Carriers, Users and Marketplace Dynamics](#)

Jim Walker, U.S. Army Corps of Engineers, *presiding*

[Jerry Knapper, Ingram Barge](#)

Stephen Carmel, Maersk Line, Limited

[Nick Marathon, U.S. Department of Agriculture](#)

[Roy Pearson, Federal Maritime Commission](#)

4:00 p.m. – 5:30 p.m., *Great Hall*

Reception

Reception hosted and sponsored by Ingram Barge Company

Thursday, June 28

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

8:30 a.m. – 9:00 a.m., *Auditorium*

The Role of Technology to Enhance Competitiveness and Reliability: Tools, Trends, and the Global Perspective

Thomas Wakeman, Stevens Institute of Technology

9:00 a.m. – noon, *Auditorium*

Closing Session

W. Jeff Lillycrop and Kenneth Ned Mitchell, U.S. Army Corps of Engineers, *presiding*

Results from Breakout Sessions

Session Facilitators [1A/2A](#) [1B](#) [1C/2C](#) [1D/2D](#) [2B](#) [3A](#) [3B](#) [3C](#) [3D](#)

Conceptual Framework for Analyzing the Marine Transportation System within the Intermodal System

Michael R. Hilliard, Oak Ridge National Laboratory; and Kenneth Ned Mitchell, U.S. Army Corps of Engineers

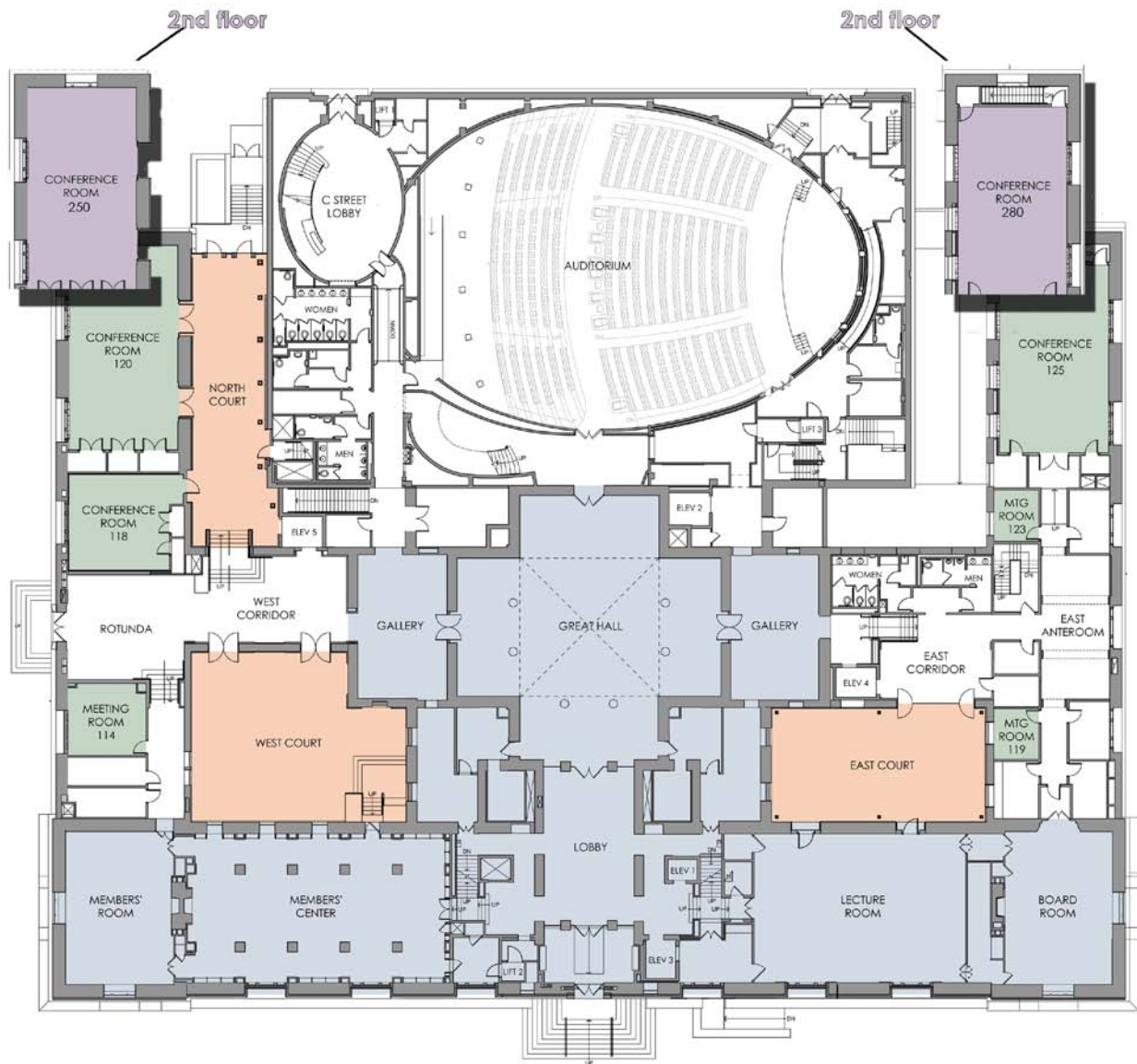
Tasks, Milestones, and Next Steps

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

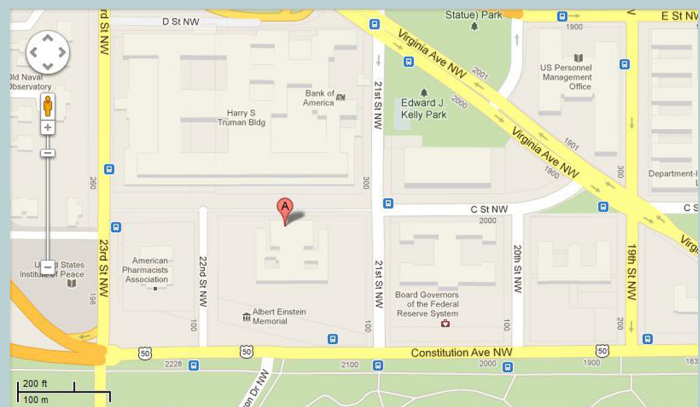
Conference Products and Closing Remarks

Margaret Spring, NOAA Chief of Staff/CMTS Coordinating Board Chair

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