6TH WORLD WATER FORUM

Inland Waterway Transport in Times of Globalization

Initial meeting of global stakeholders in inland navigation Preparatory Workshop & Side Event

"Common Issues for Inland Waterborne Transport at a Global Level"





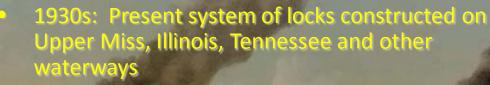
TIME FOR SOLUTIONS

Robert Pietrowsky Director, USA Institute for Water Resources 13 March 2012 Marseille, France

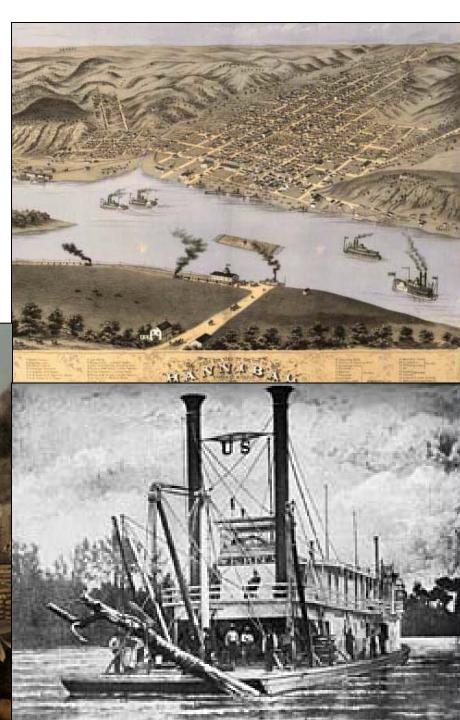


Evolution of U.S. Government Role in Inland Waterway Transport

- 1824 authority to clear snags and make improvements
- Canal building era to mid-1800s (states)
- Post Civil War suction dredging, jetties
- 1885: 1st of 46 locks and dams on Ohio



- 1950s: Construction starts on present-day higher lift locks on Ohio
 - 1960s-70s: Navigation improvements to Columbia-Snake system, Arkansas River 1985: Tenn-Tom Waterway completed 1995: Red River Waterway completed Present: Existing Infrastructure
 - Modernization, major rehab and expansion of (e.g. Upper Miss)
 - **Operate** and maintain







U.S. Inland Waterway System



McAlpine Locks & Dam, Ohio River: Construction of Parallel 1200-ft (366 m) Chamber \$430 million Dedicated July 2009

III



The Inland Waterway Connection:

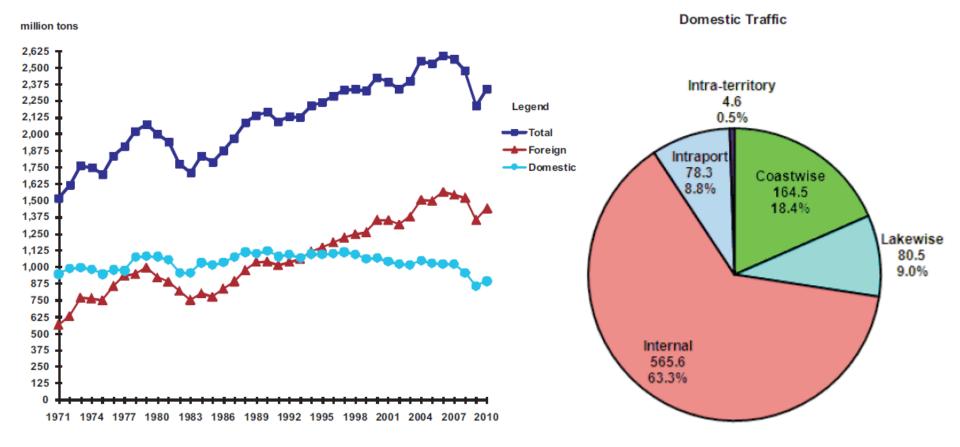


Linking the Heartland to the Coasts





- 2.3 Billion Tons in 2010 (up 6% from 2009)
- 62% Foreign Trade / 38% Domestic
- Of Domestic: 63% Inland Waterway





[®]U.S. Inland Waterway Commodities Share by Tons, 2010

All Others <1% Manufactured 1% Food & Farm Prod Coal leads in tons 14% Primary Coal Manufactured 31% 4% **Crude Materials** 15% Chemicals 9% Petro & Petro Prod 26%

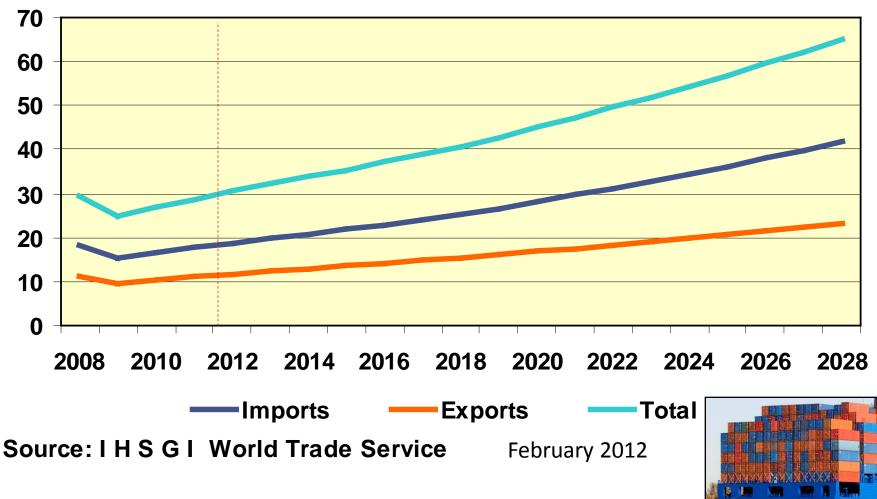
> Total 2010 Volume: 566 Million Tons Total 2009 Volume: 523 Million Tons (+ 8%)



Globalization: U.S. International Trade Forecasted to More than Double 2008 - 2028

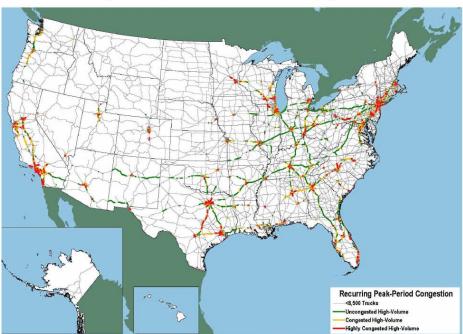






Issue: Increasing Freight Transport Demand

- Freight traffic expected to increase by 61% (2010-40) from 17 billion to 27 billion tons
- Intermodal increases from 18 to 27% of freight by value
- How will this cargo be moved?
 - Roads: Little room left to expand, especially in urban areas
 - Rail: mileage has been decreasing; much former right-of-way has been developed
 - Rail capacity constraints in urban areas, tunnel clearances, singletrack bridges



Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2040





Dimension of Locks and New-Panamax vessels

Existing Locks Max Vessel: 4,400 TEU's







Potential Game-Changer!

- Expanded canal will be an alternative to intermodal transport of imports via U.S. West Coast to East land bridge, and to Midwest to Columbia-Snake for grain & other bulk exports
- The Inland Waterways play key role in the cost efficient transport of grains, oilseeds, fertilizers and coal. New Orleans is the dominant port for the export of grains in the U.S.
- Inland Navigation on the Mississippi River system will be affected by expansion of the Panama Canal -
 - With an expanded dimension Canal, Panamax vessels can be loaded to full capacity at New Orleans
 - Smaller Capesize vessels that can fit through the expanded Canal can be accommodated by drafts of Mississippi River ports
- World demand for grain may cause grain traffic to increase on all routes, including the Mississippi River and Columbia-Snake River systems
- New Orleans also has a significant trade in U.S. export coal, though Norfolk, VA is the largest export port in trading metallurgical coal in particular



Agricultural Areas Proximity to Waterways - Exports

NORTH AMERICAN CROPLAND INTENSITY

- Minneapolis Sioux City Pittsburgh Muskogee Atlantic Ocean Shreveport **Gulf of Mexico** Pacific Ocean PERCENTAGE OF AREA CONTAINING CROPLAND All Cropland No Cropland Heads of Navigation Navigable waterways of the Greater Mississippi Basin ht STRATFOR 2011 www.STRATFOR.co
- Grain Exports
 - Over 70 million tons annually
 - 50% of grain,
 soybean and
 prepared feed
 exports move
 by barge



Common Inland Waterway Transport Issues



- 1. Increased focus on environmental sustainability
- 2. Leverage <u>technology</u> advancements
- 3. Need to re-capitalize aging Infrastructure
- 4. Need for <u>seamless freight transport connections</u>
 - between waterways & ports; and intermodal connections via rail, highway
 - Imports how to accommodate projected increases
 - U.S. President's export initiative
 - Efficiency of delivery time and cost
- 5. <u>Financing future needs</u> during stalled global economy



Common Issue 1 - Navigation & Ecosystem Sustainability





Goal: Long-term sustainability of the economic uses and ecological integrity of the Upper Mississippi River System

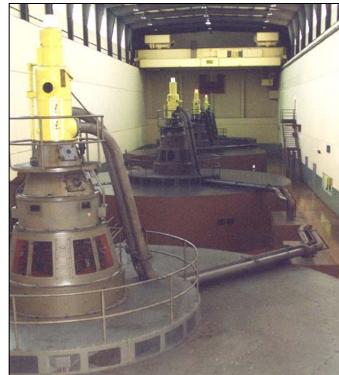


[®] Integrated Water Resources Management

- Past development allows Inland Waterway projects to serve a variety of purposes
 - Hydropower
 - Flood Protection
 - Environmental Restoration
 - Water Supply
 - Recreation













Modal Efficiency

One 15-Barge Tow



216 Rail Cars + 6 Locomotives

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1,050 Large Semi Tractor-Trailers

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Source: Texas Transp Inst., 2007

80 Source: Texas Transp Inst., 2007

average by mode...

Rail: 159 km

Inland Water: 222 km

94.8 g/ton km 60 km **Truck:**

120

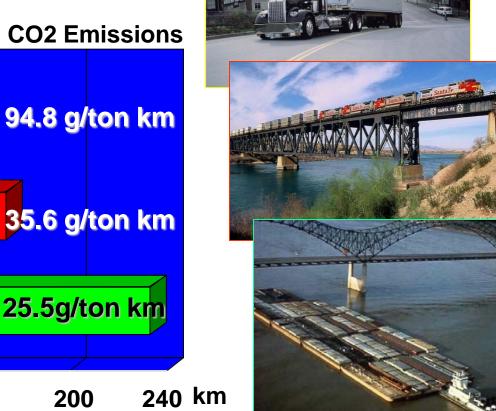
160

How far one liter of fuel moves one metric ton of

freight, and CO2 emission per unit of cargo,

Barge transportation is the most fuel efficient method of moving the raw materials needed by the nation.

Water Transportation: More Distance per Liter, Less Greenhouse Gases per Cargo Unit





CO2 Emissions

200



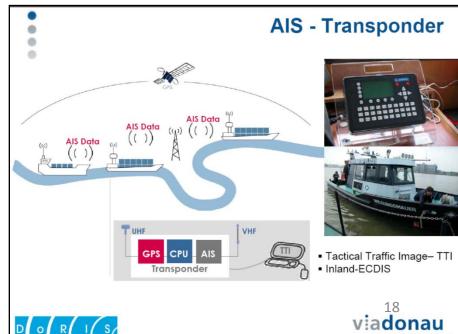






In U.S. - Coasts & Rivers Information System (CRIS)

- Working with USCG and industry to implement new data exchange
- Real time river condition information for operators
- Automated data exchange for Corps and U.S. Coast Guard and vessel operators
- Similar to AIS system in use on Danube and expanding to Rhine







Common Issue 3 - Aging Water Resources Infrastructure

- 60% of locks more than 50 years old
- Investments in water resources infrastructure have declined in real terms
- Result: more frequent closures for repairs, decreased performance and costly delays



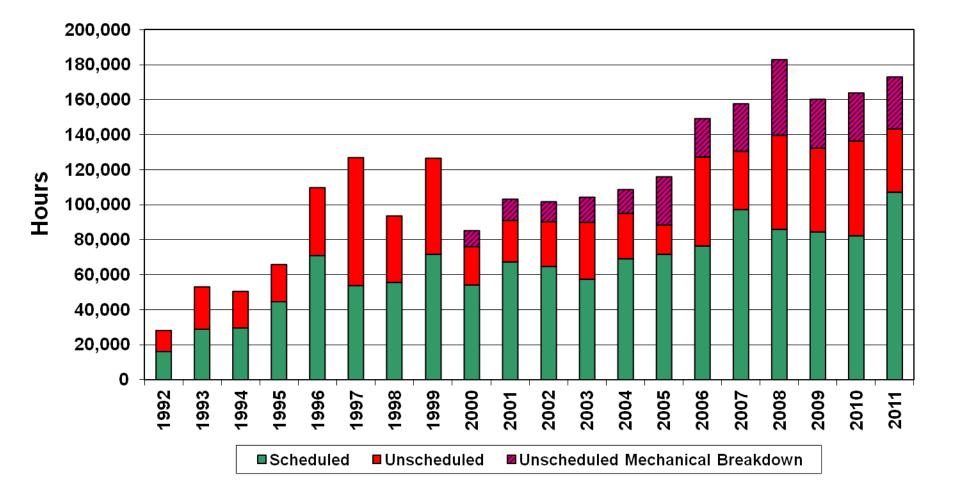


Crumbling lock wall, Lower Mon 3, opened in 1907 Concrete deterioration at Chickamauga could result in lock failure



Challenge: Aging Infrastructure + O&M Backlog = Increasing "Downtime" at Locks

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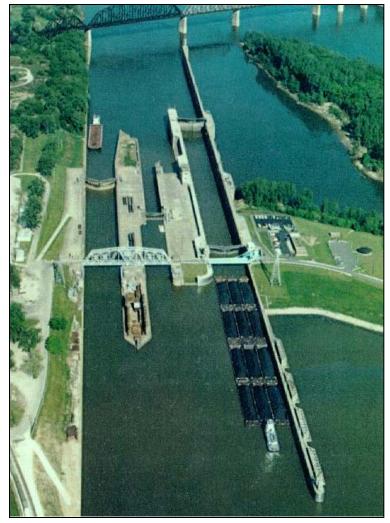


Common Issue 4 – System Connectivity: Lock Sizes - Waterway Characteristics

Variations in capacity by waterway...



Large mixed tows of over 30 barges are common on open water stretches of the Lower Mississippi River

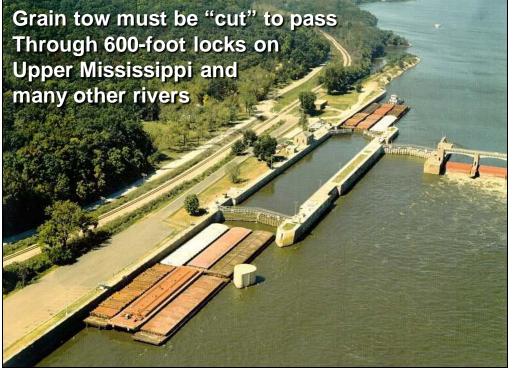


Common 15-barge coal tow at 1200' lock on Ohio River

Lock Sizes And Waterway Characteristics

Variations in capacity by waterway...

Tows on the Gulf Intracoastal Waterway are long and narrow to pass in the channel and through flood control locks





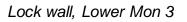
Tows on Columbia/Snake system in Pacific Northwest use unique locks with lifts over 100 feet. Tows can draft 14 feet.



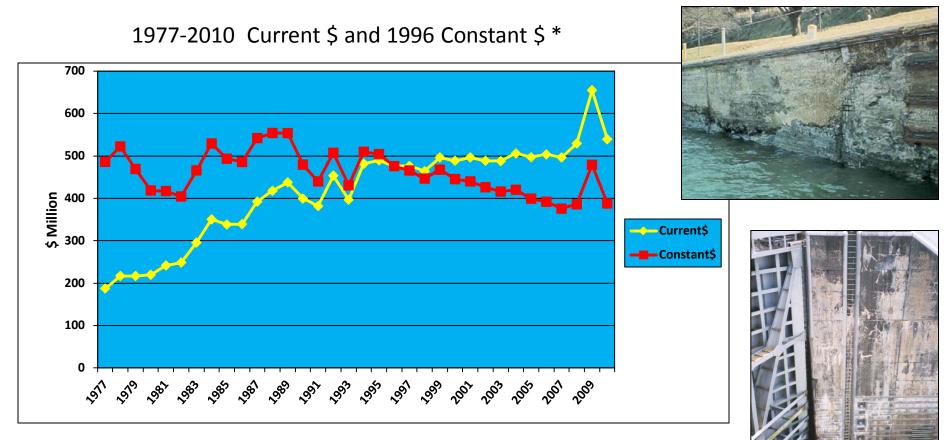
Common Issue 5 – Financing of Inland Waterway O&M



Challenge: Flat O&M funding in constant dollars, even as project portfolio grows and ages...



23



* Fuel-Taxed Waterways Only

Lock wall deterioration, Chickamauga







More freight could shift to barge, <u>if reliable</u>

- EU promotes waterways as environmentally-friendly alternative to highways and rail
- Container-on-barge highly developed in Europe
- Examples in US: Columbia-Snake; Gulf Coast service; Coastal movements along Atlantic
- Expect growth in container on barge traffic in U.S. perhaps accelerated by opening of expanded Panama Canal in 2014.





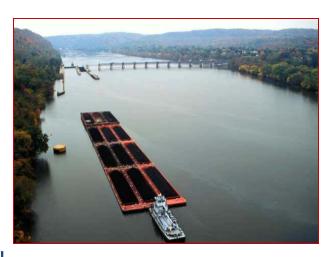
Osprey Line 750 TEU Tow on Mississippi River





MARSEILLE - FRANCE

TIME FOR SOLUTIONS MERCI / THANK YOU



worldwaterforum6.org solutionsforwater.org

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