“Common Issues for Inland Waterborne Transport at a Global Level”

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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

- 1930s: Present system of locks constructed on Upper Miss, Illinois, Tennessee and other waterways
- 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
Nearly 12,000 Miles 9 ft & Over
192 Lock Sites / 238 Chambers
Moving About 600 Million Tons
About 2/3rds Cost of Rail and 1/10 Cost of Truck
McAlpine Locks & Dam, Ohio River: Construction of Parallel 1200-ft (366 m) Chamber

$430 million

Dedicated July 2009
The Inland Waterway Connection: Linking the Heartland to the Coasts
U.S. Waterborne Commerce by Type of Traffic

- 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

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

Millions of TEUs

Source: IHS Global Insight World Trade Service
February 2012
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, single-track bridges
Dimension of Locks and New-Panamax vessels

Existing Locks Max Vessel: 4,400 TEU's

Current Locks
- Length: 366 m (1,200')
- Beam: 49 m (160')
- Depth: 12.8 m (42')

New Locks
- Length: 427 m (1,400')
- Beam: 55 m (180')
- Depth: 18.3 m (60')

New Locks Max Vessel: 12,600 TEU's

Source: Panama Canal Authority (ACP)
Potential Game-Changer!

Impacts of Panama Canal Expansion

- 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.
• 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 technology advancements
3. Need to re-capitalise aging infrastructure
4. Need for seamless freight transport connections
   – 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. Financing future needs during stalled global economy
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

1,050 Large Semi Tractor-Trailers

Source: Texas Transp Inst., 2007
Barge transportation is the most fuel efficient method of moving the raw materials needed by the nation.

How far one liter of fuel moves one metric ton of freight, and CO2 emission per unit of cargo, average by mode…

Source: Texas Transp Inst., 2007
Common Issue 2 – Improving Technology:

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

[Bar chart showing hours of scheduled, unscheduled, and unscheduled mechanical breakdowns from 1992 to 2011]
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
Variations in capacity by waterway...

Grain tow must be “cut” to pass through 600-foot locks on Upper Mississippi and many other rivers.

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

1977-2010: Current $ and 1996 Constant $ *
Solutions: Inland Waterway Transport as THE Sustainable Alternative

• More freight could shift to barge, *if reliable*
• 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
worldwaterforum6.org
solutionsforwater.org