6 TH 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"

Robert Pietrowsky
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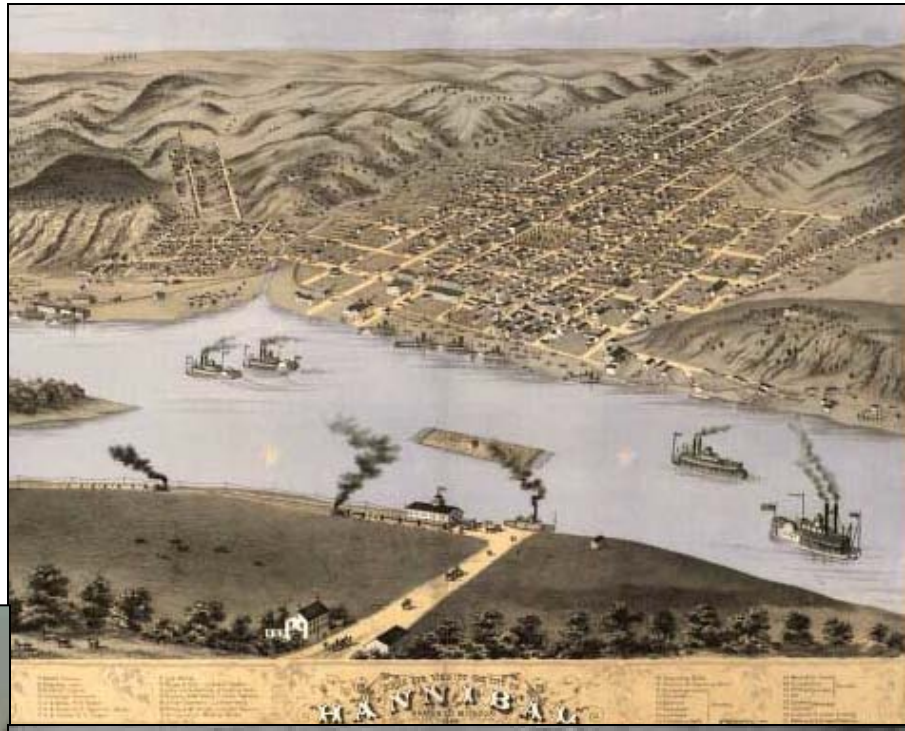
13 March 2012
Marseille, France

6th WORLD WATER FORUM
MARSEILLE, FRANCE '12
TIME FOR SOLUTIONS

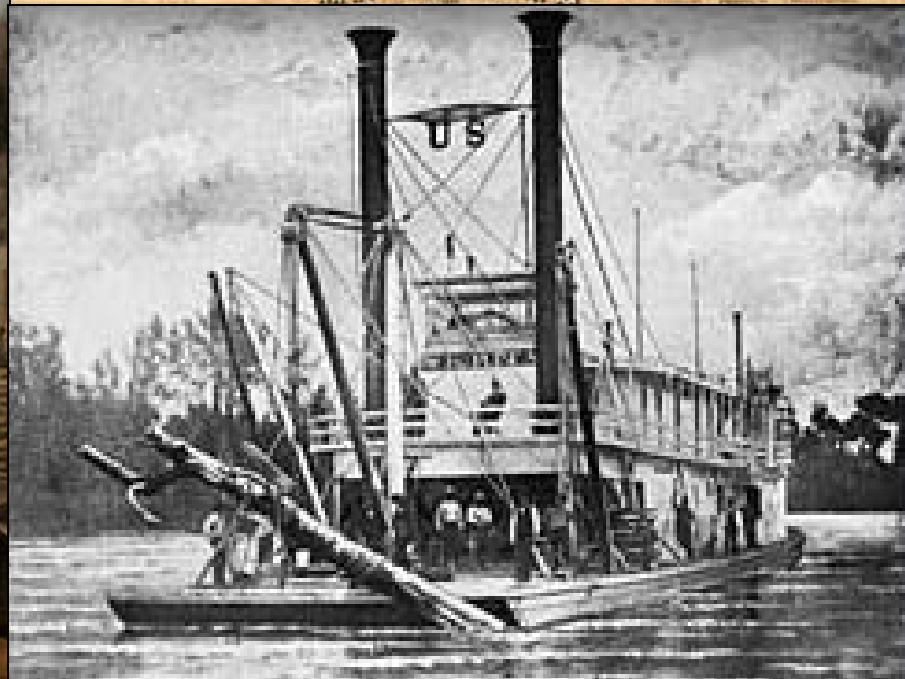
IWR INSTITUTE FOR WATER RESOURCES

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

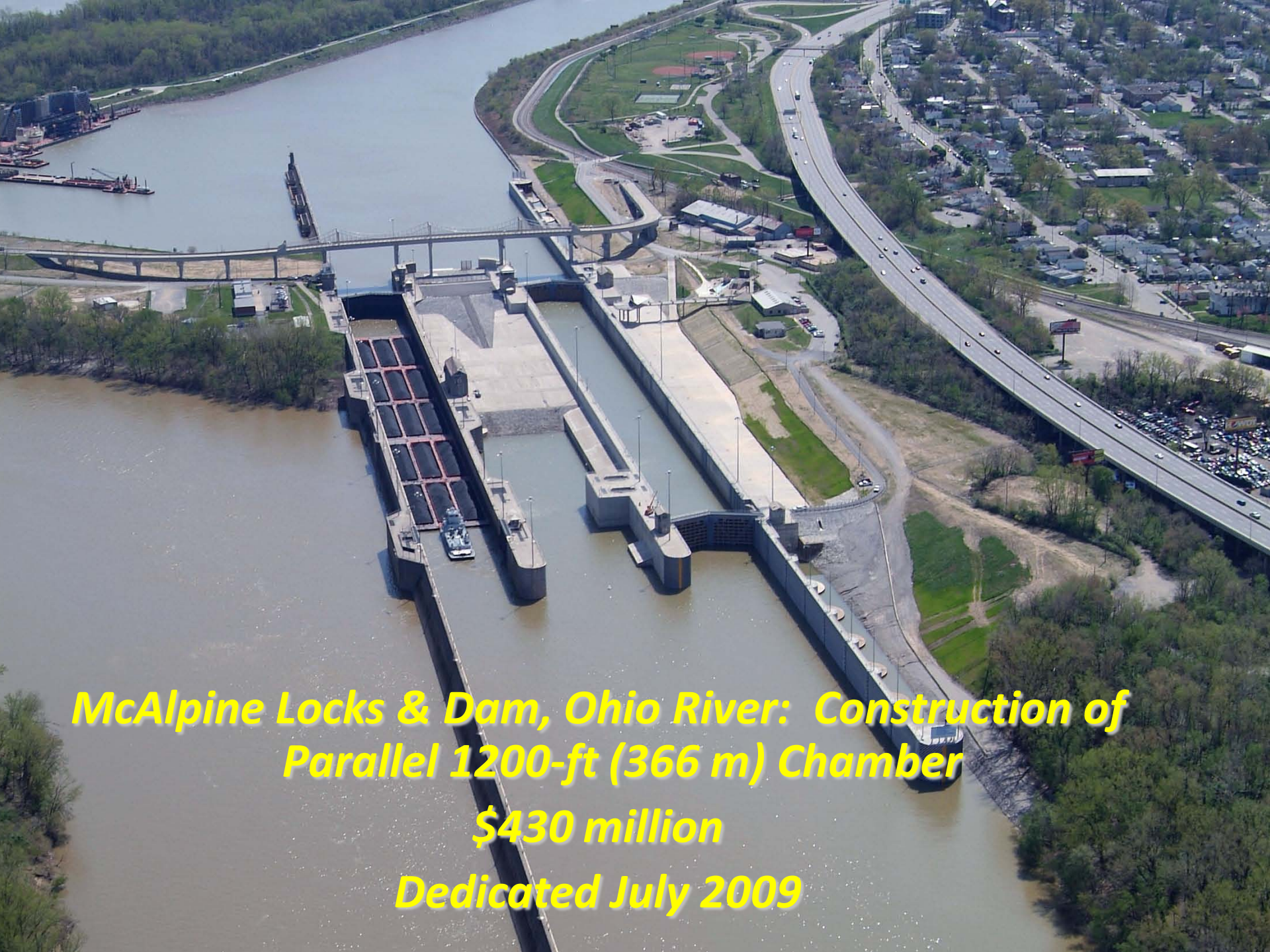


- 1930s: Present system of locks constructed on Upper Miss, Illinois, Tennessee and other waterways
- 1950s: Construction starts on present-day higher lift locks on Ohio
- 1960s-70s: Navigation improvements to Columbia-Snake system, Arkansas River
- 1985: Tenn-Tom Waterway completed
- 1995: Red River Waterway completed
- Present: Existing Infrastructure
  - Modernization, major rehab and expansion of (e.g. Upper Miss)
  - Operate and maintain



U.S. Inland Waterway System

- *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*



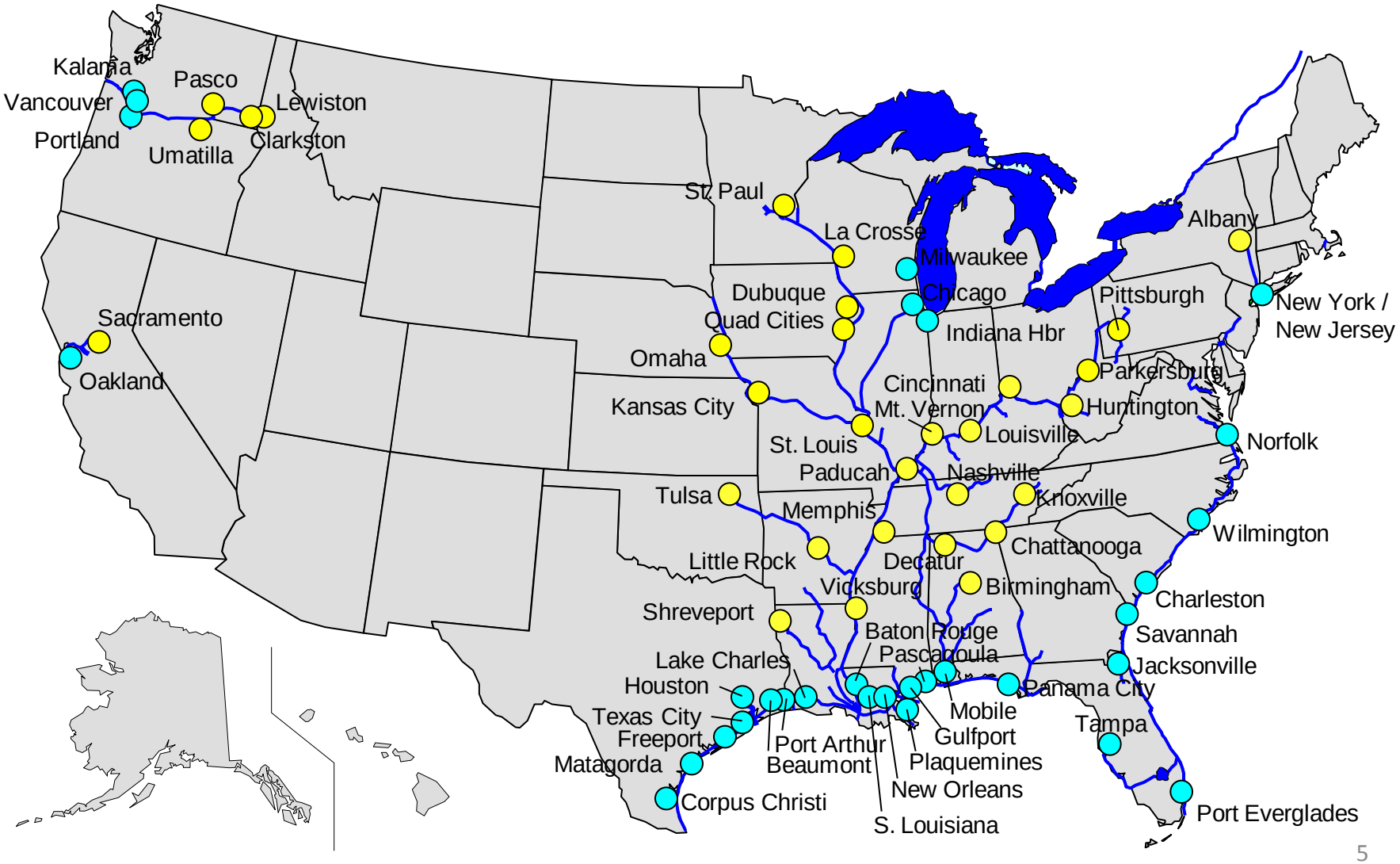
McAlpine Locks & Dam, Ohio River: Construction of Parallel 1200-ft (366 m) Chamber

$430 million

Dedicated July 2009

The Inland Waterway Connection:

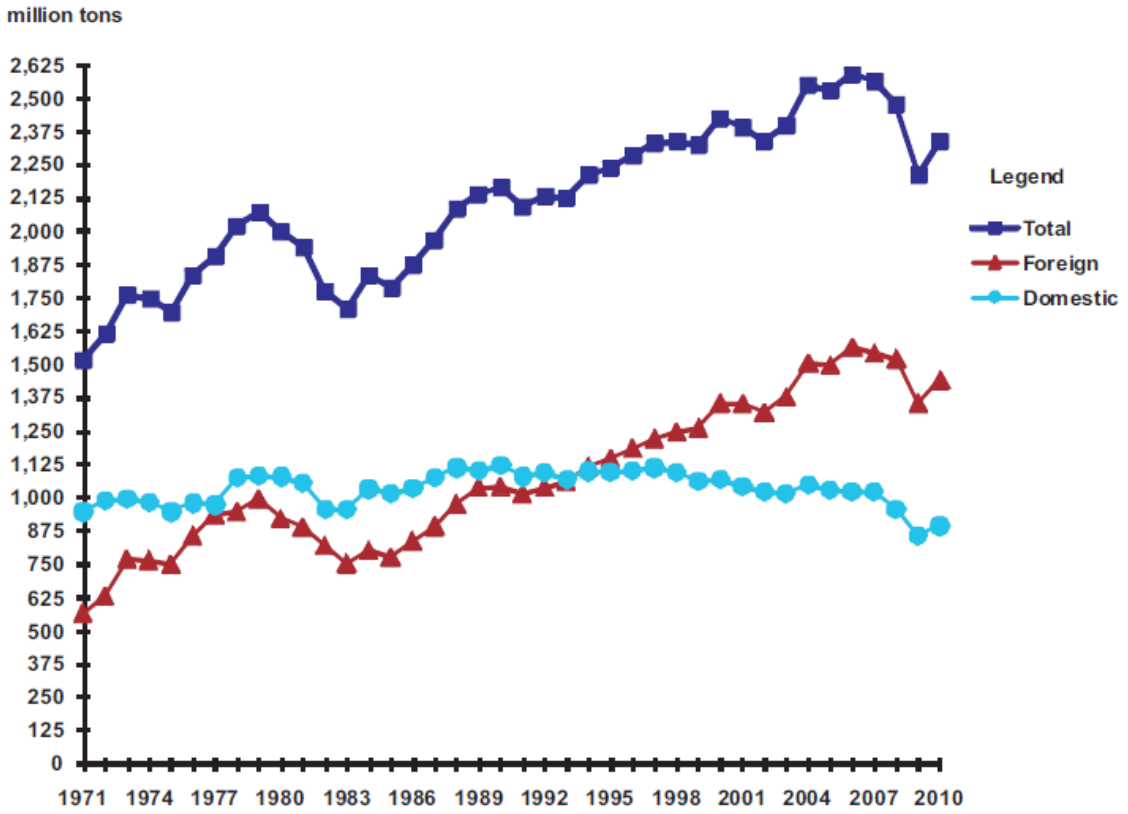
Linking the Heartland to the Coasts

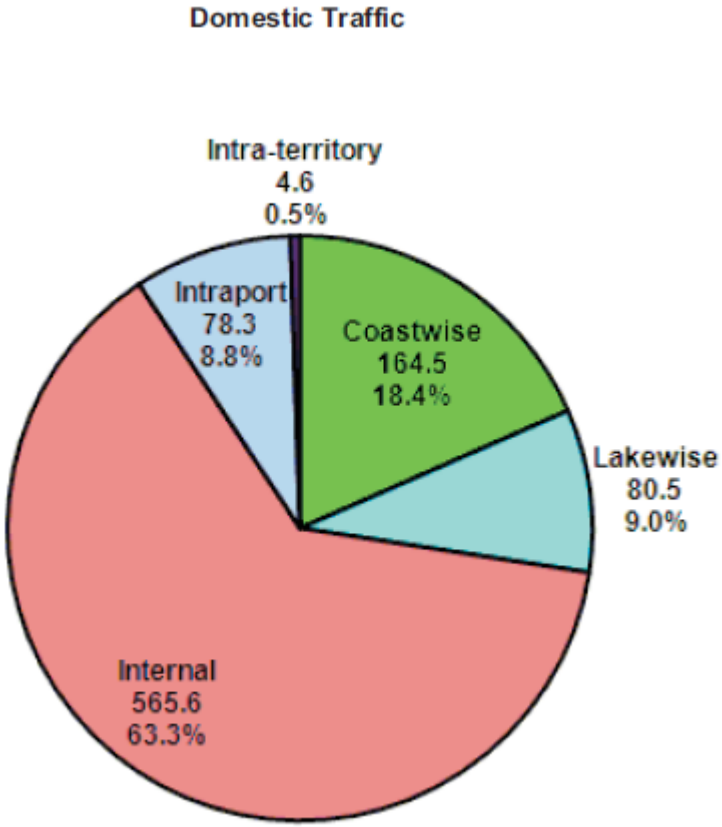


U.S. Waterborne Commerce

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

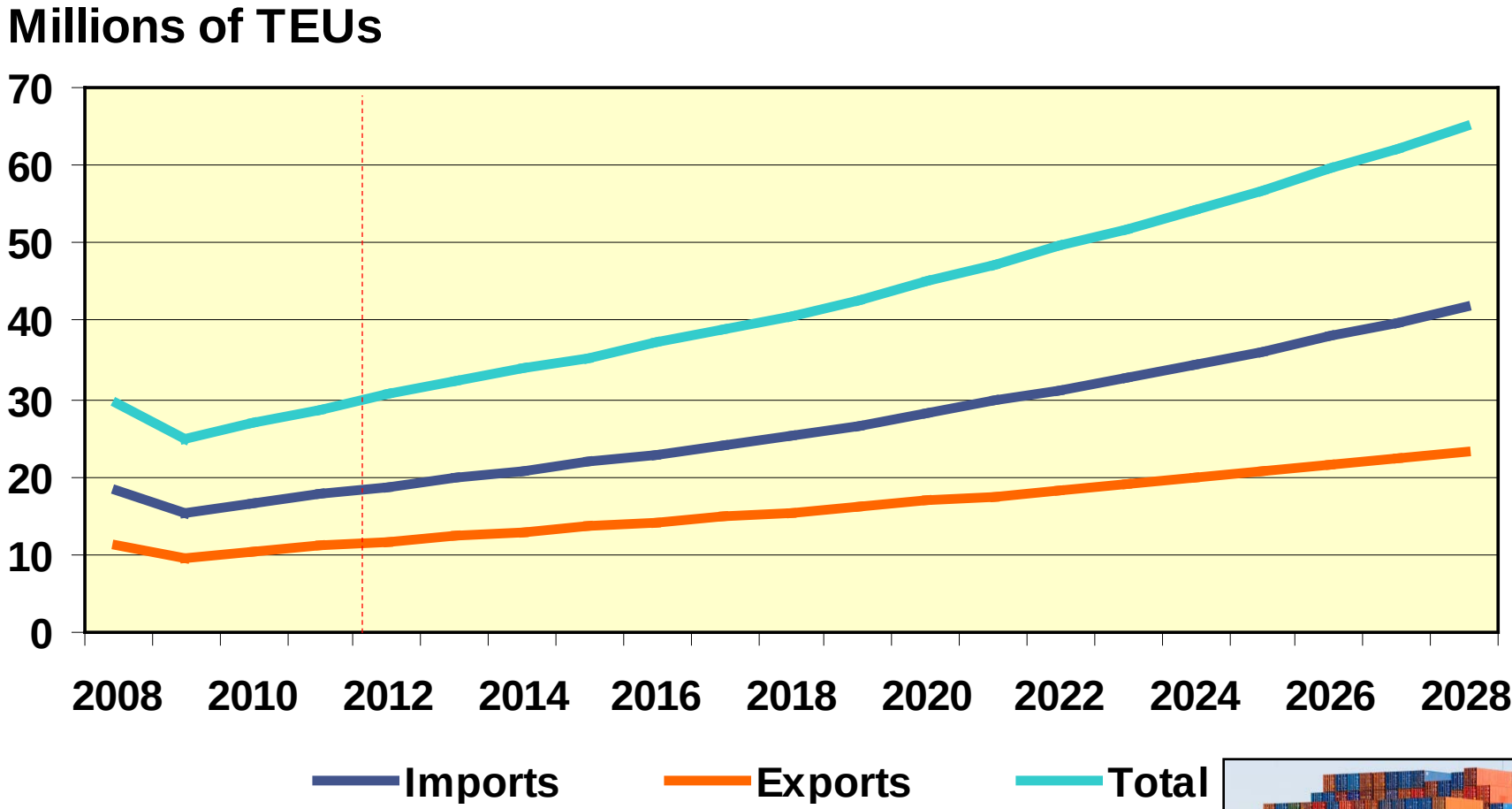
Share by Tons, 2010

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

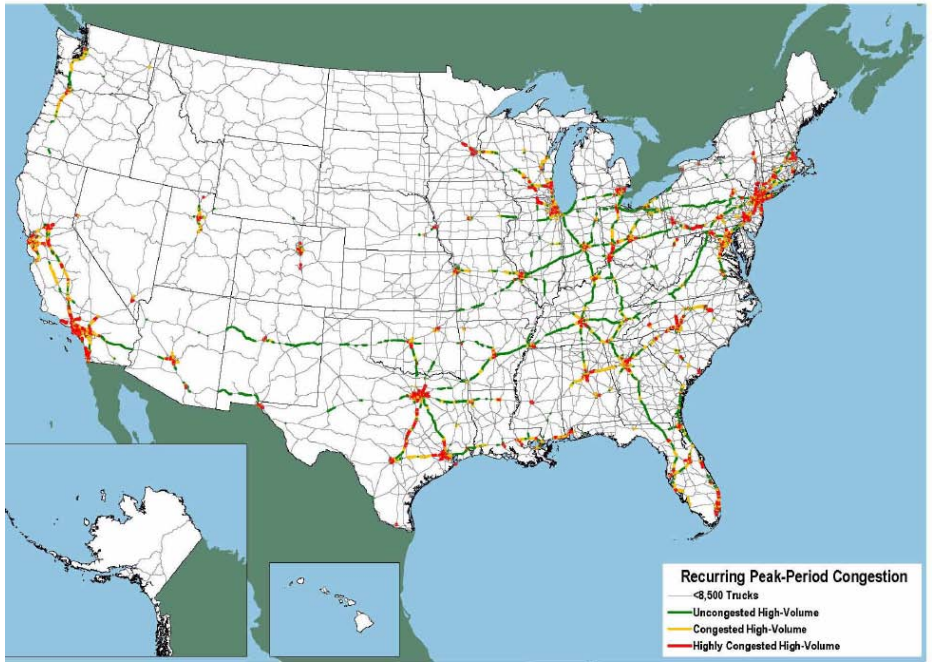


Source: I H S G I World Trade Service February 2012

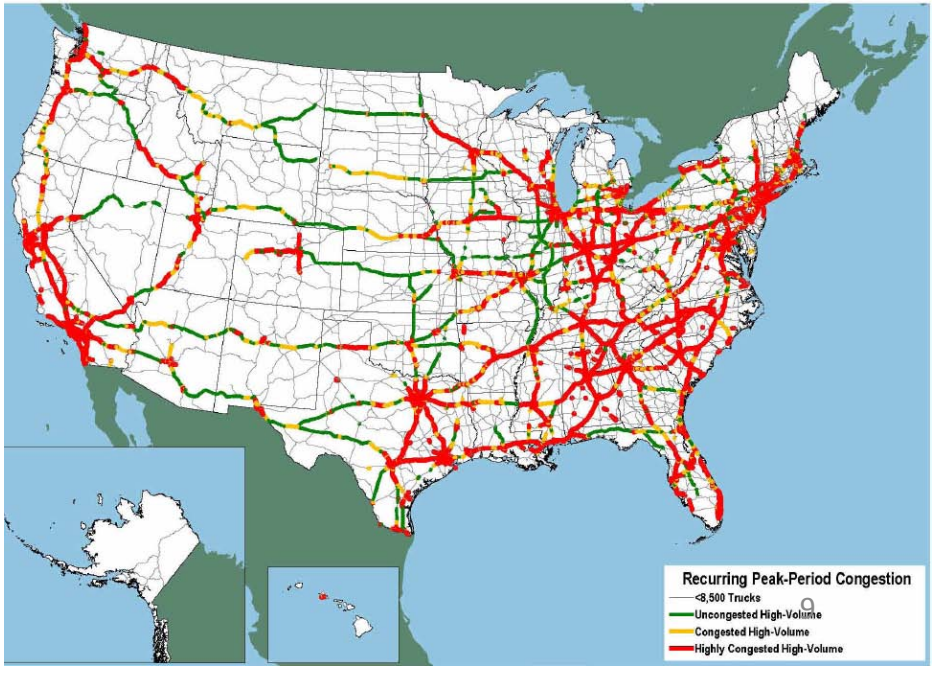
Issue: Increasing Freight Transport Demand

- 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

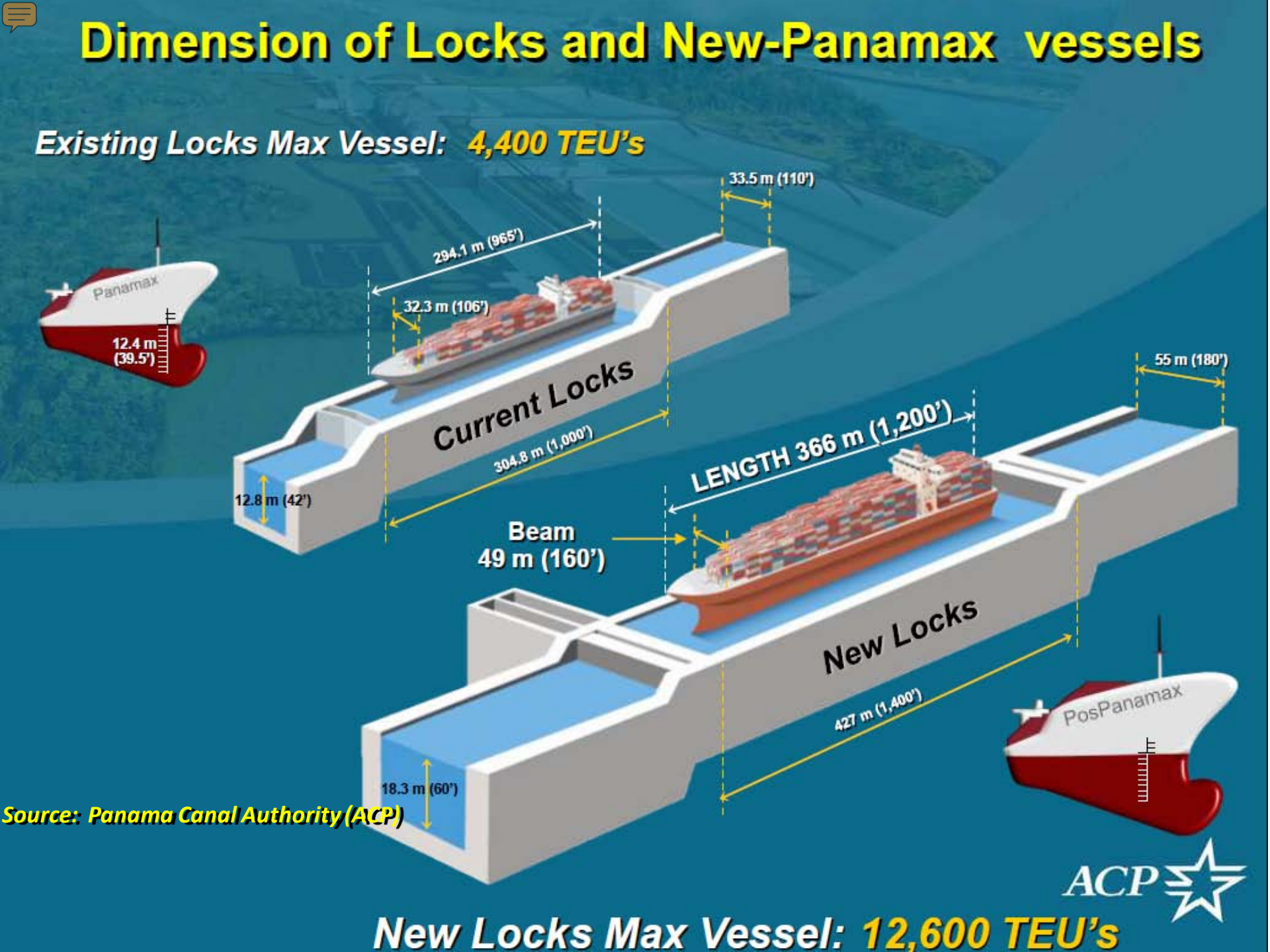
Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2007



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



Dimension of Locks and New-Panamax vessels



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

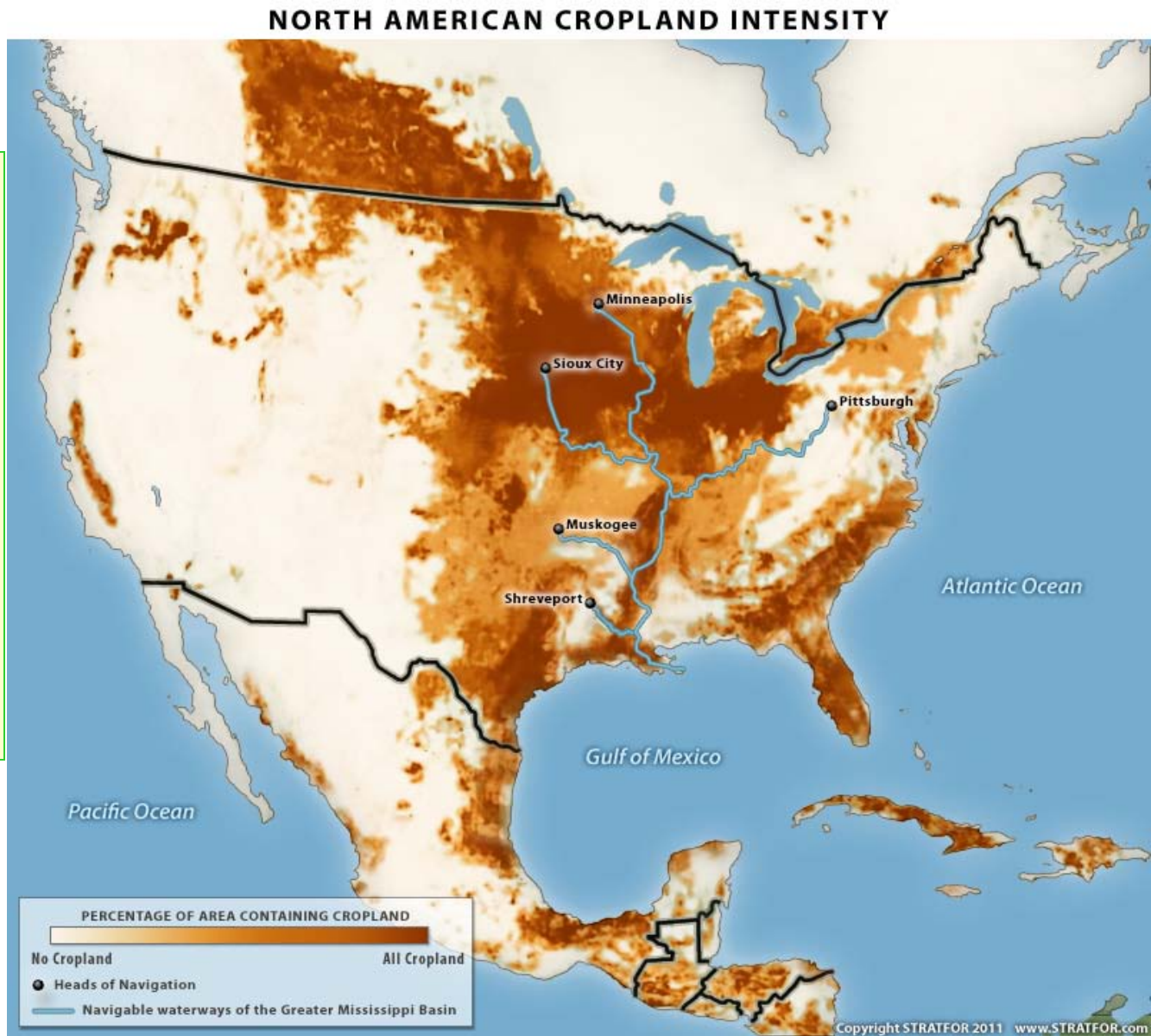
- The Inland Waterways play key role in the cost efficient transport of grains, oilseeds, fertilizers and coal. New Orleans is the dominant port for the export of grains in the U.S.

- 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

Agricultural Areas Proximity to Waterways - Exports

- Grain Exports
  - *Over 70 million tons annually*
  - *50% of grain, soybean and prepared feed exports move by barge*



Common Inland Waterway Transport Issues

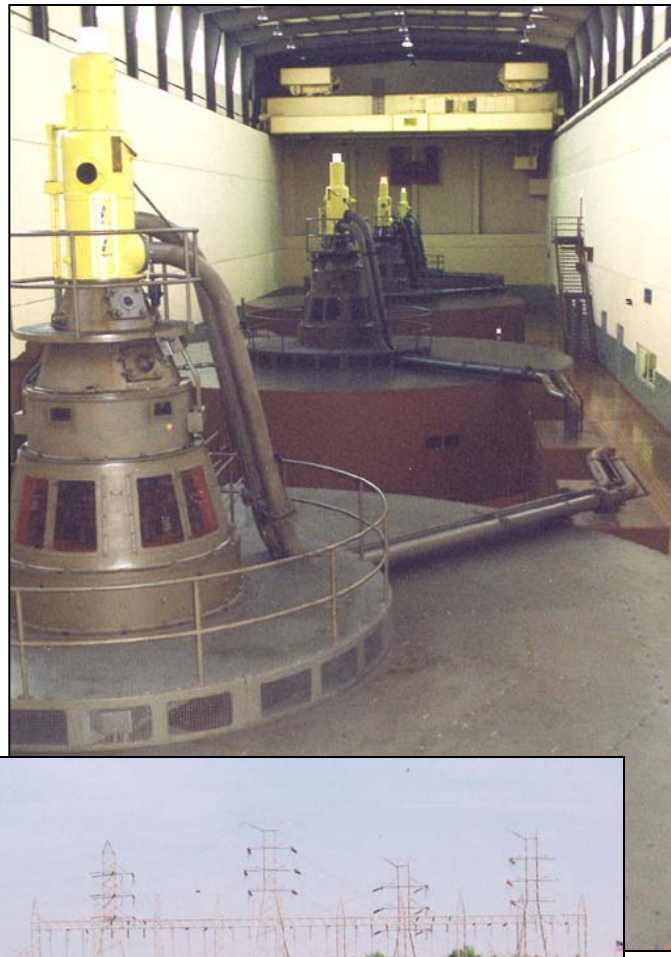
1. Increased focus on environmental sustainability
2. Leverage technology advancements
3. Need to re-capitalize aging Infrastructure
4. Need for seamless freight transport connections
   - between waterways & ports; and intermodal connections via rail, highway
   - Imports – how to accommodate projected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

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

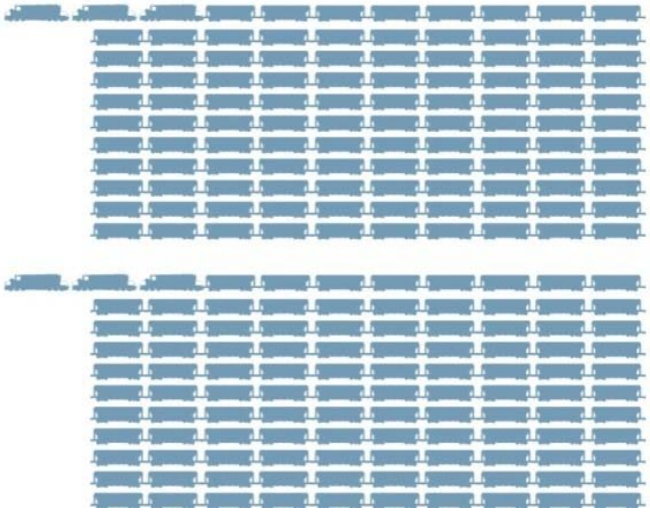
- Past development allows Inland Waterway projects to serve a variety of purposes
  - Hydropower
  - Flood Protection
  - Environmental Restoration
  - Water Supply
  - Recreation



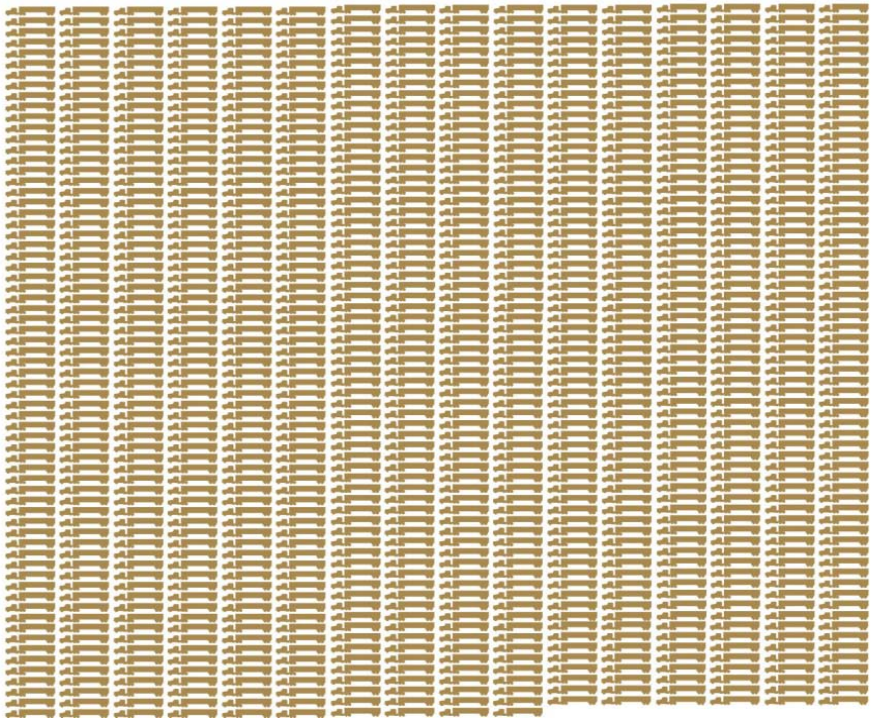
Modal Efficiency

One 15-Barge Tow

216 Rail Cars + 6 Locomotives



1,050 Large Semi Tractor-Trailers

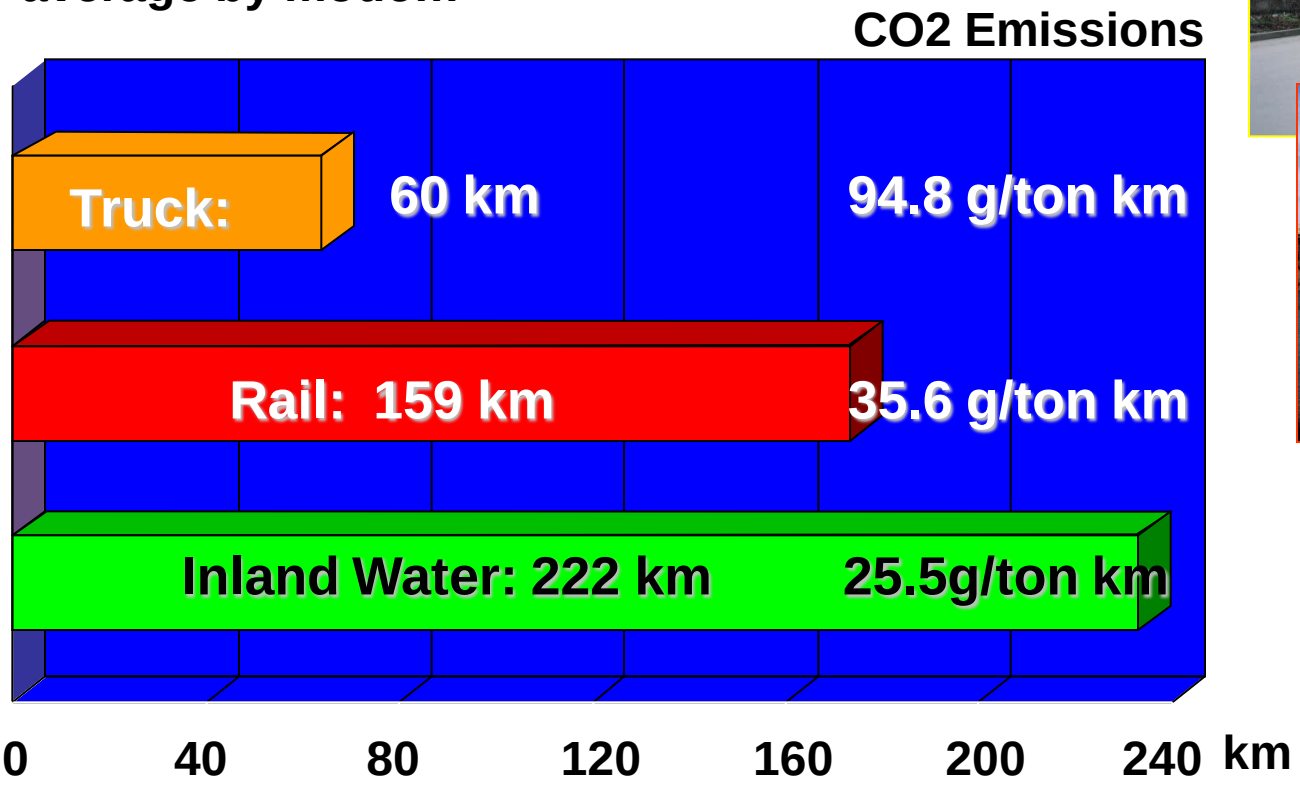


Source: Texas Transp Inst., 2007

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

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…



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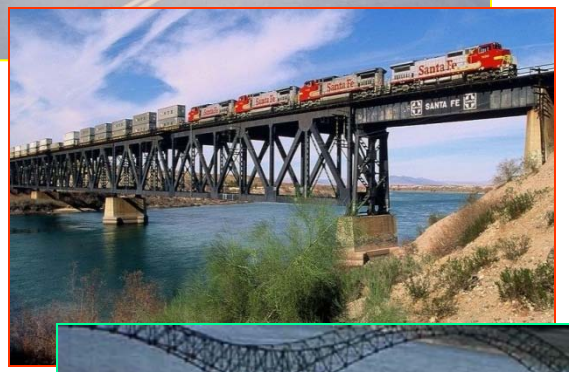
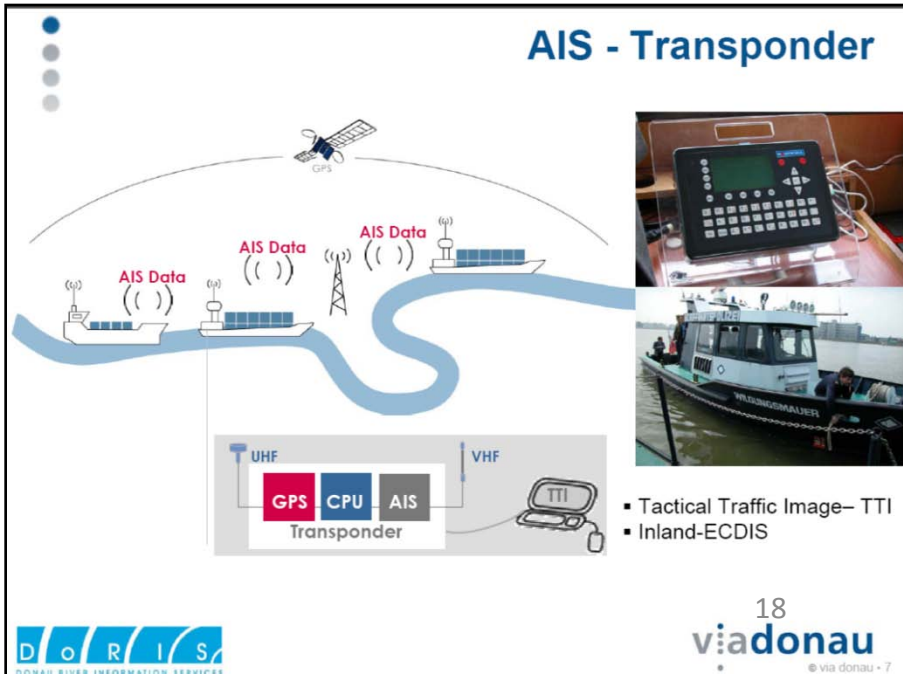


Common Issue 2 – Improving Technology:

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

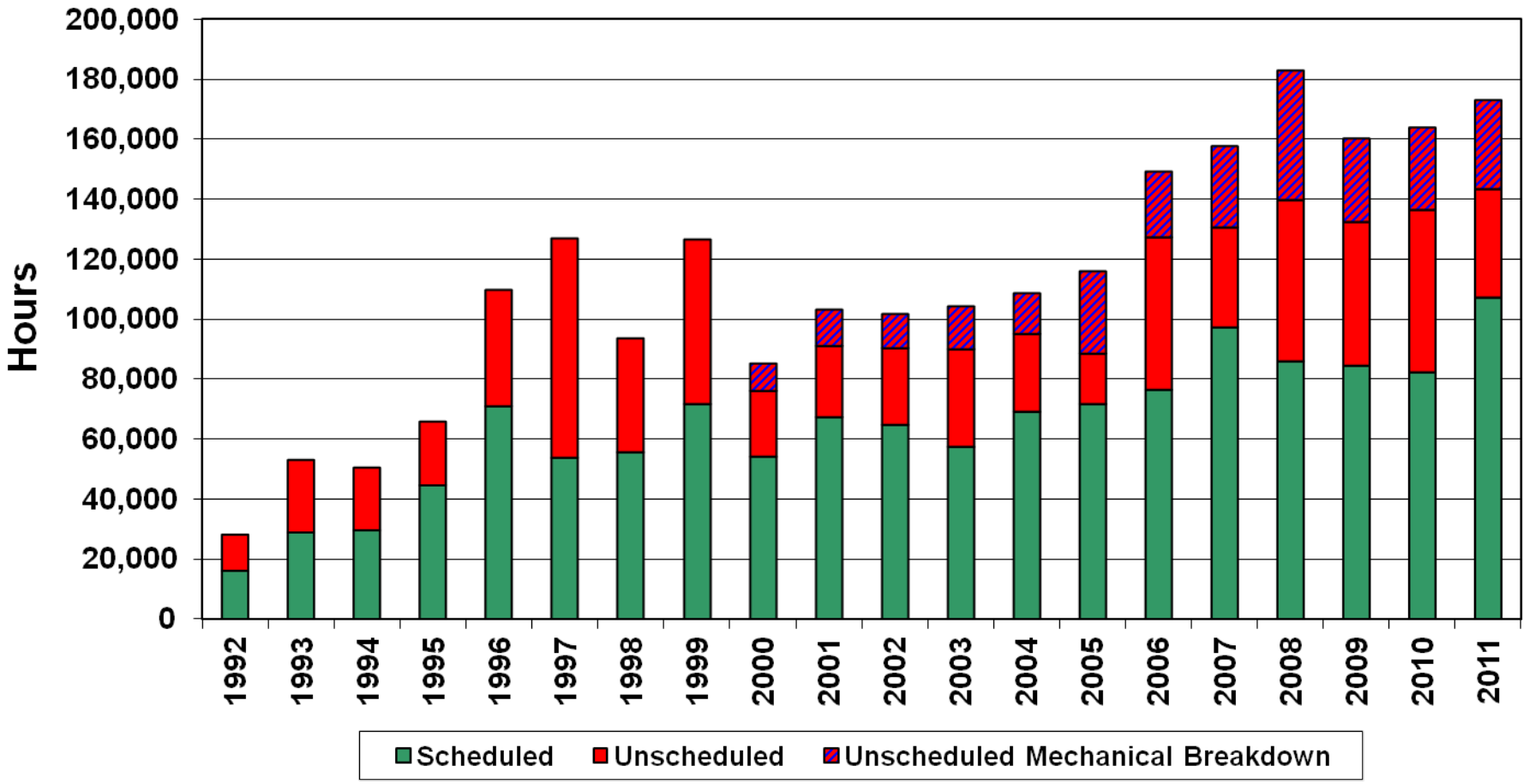
- 60% of locks more than 50 years old
- Investments in water resources infrastructure have declined in real terms
- Result: more frequent closures for repairs, decreased performance and costly delays

Leaking miter gates, Lock & Dam 52, Ohio R.

Crumbling lock wall, Lower Mon 3, opened in 1907

Concrete deterioration at Chickamauga could result in lock failure

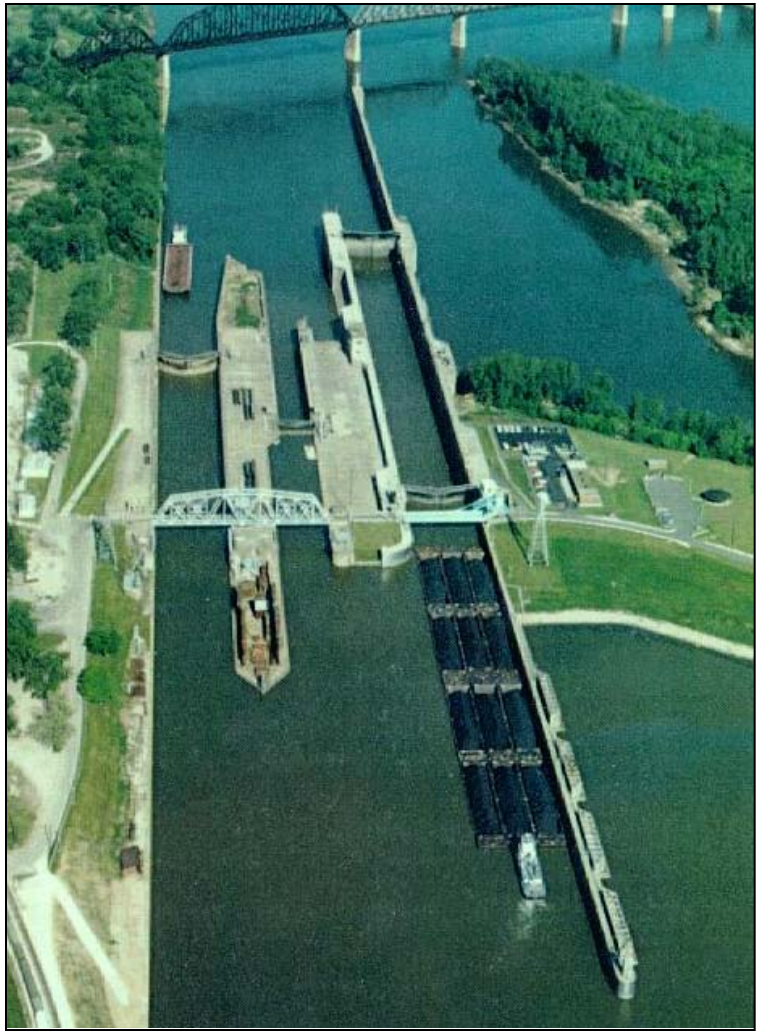
Challenge: Aging Infrastructure + O&M Backlog = Increasing "Downtime" at Locks



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

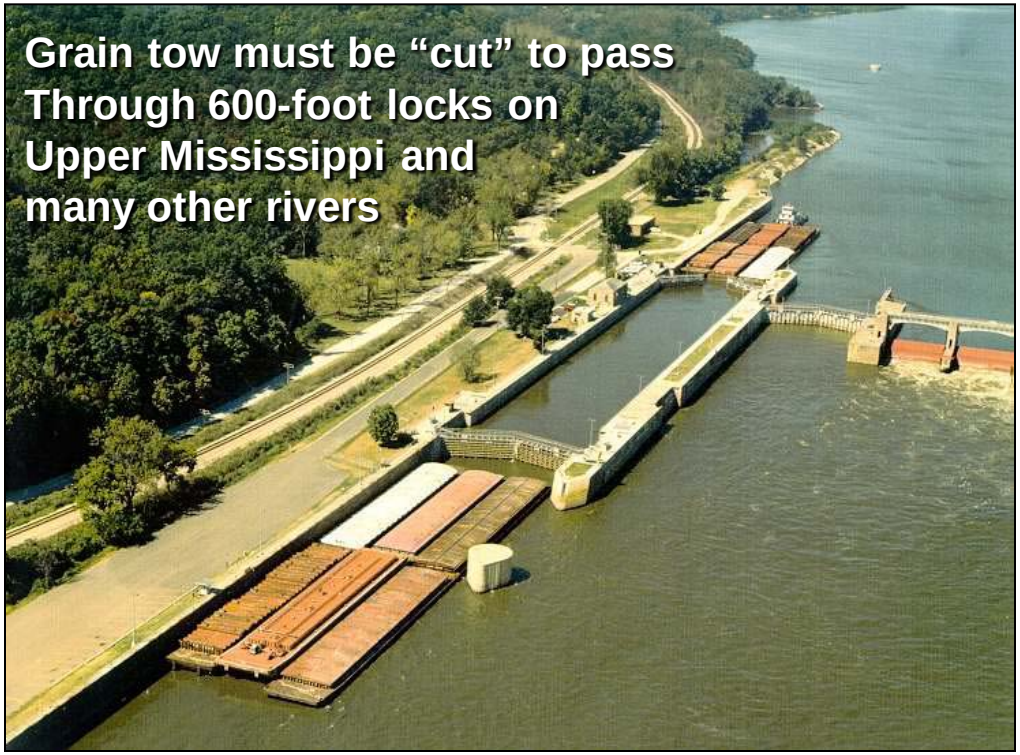


Common 15-barge coal tow at 1200’ lock on Ohio River

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



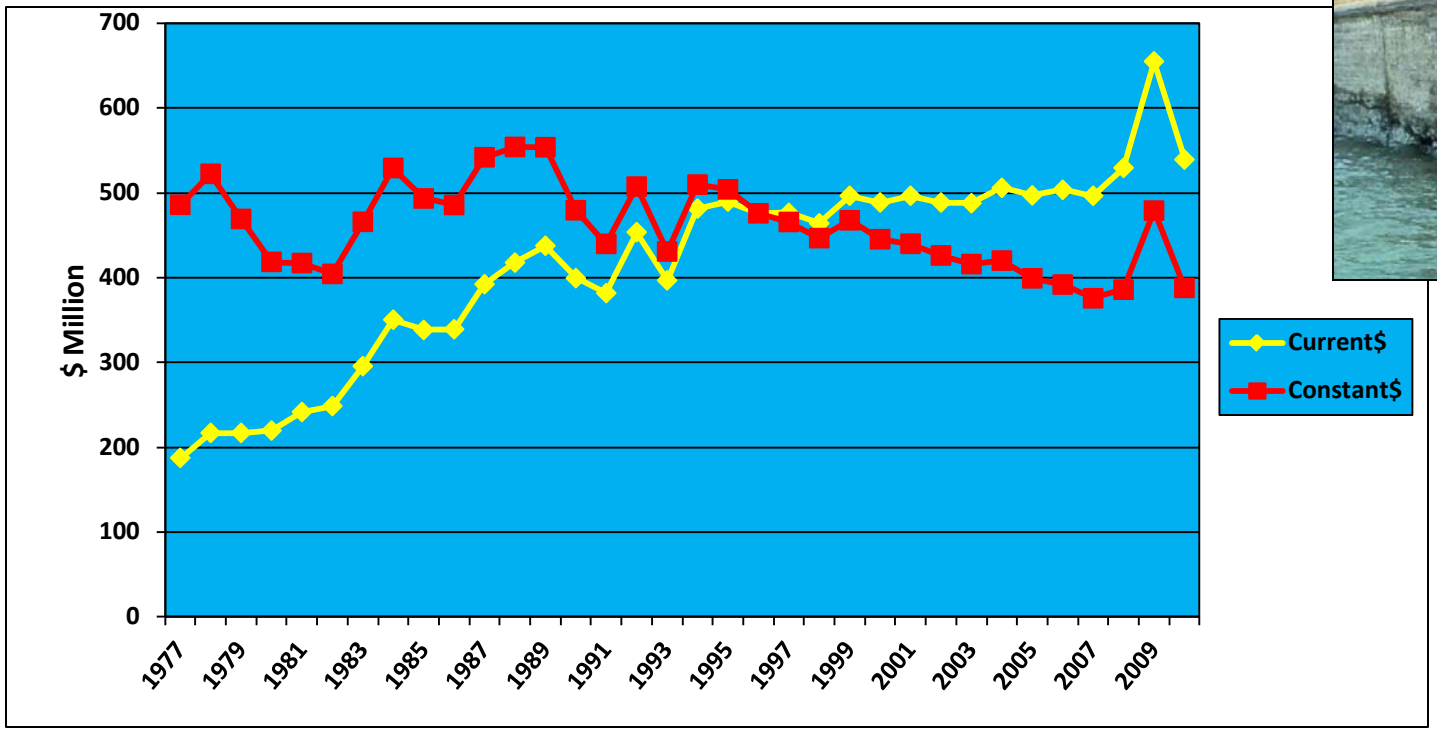
Grain tow must be “cut” to pass Through 600-foot locks on Upper Mississippi and many other rivers

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…

1977-2010 Current $ and 1996 Constant $ *



* *Fuel-Taxed Waterways Only*

Lock wall, Lower Mon 3

Lock wall deterioration, Chickamauga

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

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TIME FOR SOLUTIONS

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