Water and Transport
United States – Local Action
Country Report

Fourth World Water Forum
Session FT1.06
Mexico City, Mexico

Robert A. Pietrowsky
Director, USACE
Institute for Water Resources

March 17, 2003
Outline

- U.S. Waterway Transport System
- Historical Development
- Current Usage and Traffic Patterns
- Future Challenges and Innovations to Improve Waterway Transport
U.S. Army Corps of Engineers Activities

Water Resources Missions

Primary

- Water Transport
- Flood Control & Shore Protection
- Ecosystem Restoration
- Disaster Response & Recovery

Allied Purposes

- Hydropower
- Environmental Stewardship
- Water Supply
- Recreation

Regulatory Programs
Federal Role in U.S. 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, other waterways
- 1950s: Construction starts on present-day higher lift locks on Ohio
- 1960s-70s: Navigation improvements to Columbia-Snake, Arkansas River
- 1985: Tenn-Tom Waterway completed
Federal Role in U.S. 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, other waterways

1950s: Construction starts on present-day higher lift locks on Ohio

1960s-70s: Navigation improvements to Columbia-Snake, Arkansas River

1985: Tenn-Tom Waterway completed


National Development Context

1824 – 1936: Nation Building Era of primarily Single Purpose Navigation Projects

1936 – 1986: Era of Economic Efficiency focusing on Multi-Purpose Projects


U.S. Water Transport System

- Contributes ~ 8% GDP
- System nearing capacity
- Commerce expected to double by 2020
- Already a generation behind in channel design or lock capacity at key U.S. load centers & system choke points
- Capacity constraints increase transportation costs, pollution, congestion

National Need

An environmentally sustainable, robust, world-class maritime transportation system
U.S. Water Transport Commodities Share by Tons, 2004

Total 2004 Volume: 626 Million Tons
(568 Million Metric Tonnes)
U.S. Waterway Transport Role in Economic Development

- **Grain Exports**
  - 82 million metric tons (90 million tons) annually

- **Coal for power plants**
  - 154 million metric tons (170 million tons) annually
  - 20% of utility coal supplied by inland waterway

- **Petroleum**
  - 136 million metric tons (150 million tons) annually
Value of Inland & Intra-coastal Cargo
by U.S. State of Origin

Based on 2001 data developed by TVA and USACE.

Over $112 billion in cargo
Shipped from 31 states
At average savings of $11 / ton
Emerging U.S. Water Transport Challenges

- Increasing Domestic & International Trade
- System Capacity Problems
- Aging Infrastructure
- Constrained Funding
- Need for Integrated Solutions to Water Resources Challenges
  - Water Transport Systems
  - Environmental Restoration
  - Flood Management
  - Water Quantity & Quality
Challenge: Traffic Growth & Capacity Constraints

Average Hourly Delays by Lock - All Tows, 2005

Multiple lockages to pass a tow result in long queues that are costly and inefficient.
Challenge: Aging Infrastructure + O&M
Backlog = Increasing “Downtime” at Locks

This erodes the effective capacity of the navigation system over time...

Navigation Lock Unavailability, 1991-2005
Total Hours Scheduled vs. Unscheduled without Ice
Other Innovations to Improve Waterway Transport

- Electronic tracking & traffic management options
- Developing modern river ports for economic growth
- New methodologies for understanding and prioritizing investment needs for budget purposes
  - Next generation of state-of-the-art marine transportation economic evaluation models
- Adoption of IWRM perspective crucial to sustainable development
Future Freight Demand

- Domestic freight traffic expected to increase by 67%
- General cargo freight by 113%
- Highway traffic grows from 11 billion to 19 billion tons (17.2 billion metric tons)
- Rail grows from 2 to 3.7 billion tons (3.4 billion metric tons)
- How is this cargo going to move?
  - Little room left to expand highways, 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
Container On-Barge

- Alleviate Highway Congestion
- Linking Domestic/International Markets
- Osprey Line – 15 barge movement last year

### Alternate Transportation Mode Comparison

<table>
<thead>
<tr>
<th>Mode</th>
<th>Barge 1500 Ton</th>
<th>15-Barge Tow 22,500 Ton</th>
<th>52,500 Bushels</th>
<th>6,804,000 Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumbo Hopper Car 100 Ton 3,500 Bushels</td>
<td>100 Car Unit Train 10,000 Ton 350,000 Bushels</td>
<td>3,024,000 Gallons</td>
<td>3,024,000 Gallons</td>
<td></td>
</tr>
<tr>
<td>Large Semi 26 Ton 910 Bushels</td>
<td>7,865 Gallons</td>
<td>870 Trucks 34 1/2 Miles Assuming 150 Ft. Between Trucks</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 1 Barge = 15 Jumbo Hoppers
- 1 Tow = 2 1/4 Unit Trains
- 58 Trucks = 1 1/4 Mile 15 Barge Tow
- 2 3/4 Miles 1 Tow
- 34 1/2 Miles 58 Trucks Assuming 150 Ft. Between Trucks
Summary

Water transport as key factor to Nation’s development throughout U.S. history.

Water transport expected to remain important, but with new investment strategies and contemporary focus on integrated water resources management alternatives.

- Waterways remains critical for moving freight at lower cost, more safely, and with fewer polluting emissions than alternative transportation modes.
- New capital and maintenance investments are critical to maintaining and managing world-class waterway system.
- A modern, efficient and reliable system is critical to meeting U.S. future freight transportation needs in a global economy.
Robert A. Pietrowsky
Director

703-428-8250
robert.a.pietrowsky@usace.army.mil