U.S. Port and Inland Waterway Modernization Strategy: Options for the Future

Norfolk, Va
14 March 2012
The U.S. Navigation System
Navigation

Inland and Intracoastal Waterways
- 12,000 miles; 9’ – 14’
- 240 Lock Chambers
- 630 million tons annually; ~50% coal & petroleum
- Grain Exports >70 m tons/yr
- 50% of grain, soybeans & prepared feed exports by barge

Coastal Harbors
- 300 major seaports; 2 billion short tons annually; 95% of import/export
- Over 700 small harbors; 600 million tons annually
- 13 million US jobs
Forecast Total World Container Trade
2000 - 2024

- Doubled from 60 million TEUs in 2000 to about 120 million in 2008
- Slight decline forecast in 2009
- Renewed growth to about 260 million TEUs by 2024
- That is down 40 million TEU from earlier forecasts

Source: IHS Global Insight, Inc. Dec 08
Forecast: U.S. Trade More Than Doubles
2008 - 2028

Millions of TEUs

Source: IHS Global Insight World Trade Service
Ever Larger Containerships
Driving Need for Ever Larger Channels

- **Pre-1970**: 1,700 TEU, <10 Containers Wide
- **1970-1980**: 2,305 TEU, 10-11 Containers Wide
- **1985**: 3,220 TEU, 11-13 Containers Wide
- **1986-2000**: 4,848 TEU, 13-17 Containers Wide
- **2000-2005**: 8,600+ TEU, 17-22 Containers Wide

**Sea Level**:
- <30'
- 33'
- 38'-42'
- 42'-46'
- > 46'
PERCENT CHANGE IN PORT CALLS BY CONTAINERSHIP SIZE

2003 - 2008

PERCENT CHANGE

TEU SIZE OF CONTAINERSHIP

Feeder & Feedermax (LE999)
Handy (1000 - 1,999)
Sub-Panamax (2,000 - 2,999)
Panamax (3,000 - 3,999)
Post-Panamax (4,000 - 4,999)
Post-Panamax (GT 5,000)
U.S. Port and Inland Waterways Modernization Strategy
World Fleet: Historical and Forecasted Fully Cellular Container Vessels
by TEU Class 2000-2030

<table>
<thead>
<tr>
<th>Year</th>
<th>12 k TEU +</th>
<th>7.6 k to 12 k TEU</th>
<th>5.2 k to 7.6 k TEU</th>
<th>3.9 k to 5.2 k TEU</th>
<th>2.9 k to 3.9 k TEU</th>
<th>1.3 k to 2.9 k TEU</th>
<th>0.1 k to 1.3k TEU</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>-</td>
<td>-</td>
<td>104</td>
<td>203</td>
<td>272</td>
<td>850</td>
<td>1,214</td>
</tr>
<tr>
<td>2011</td>
<td>-</td>
<td>47</td>
<td>456</td>
<td>707</td>
<td>364</td>
<td>1,420</td>
<td>1,604</td>
</tr>
<tr>
<td>2015</td>
<td>124</td>
<td>124</td>
<td>498</td>
<td>735</td>
<td>393</td>
<td>1,446</td>
<td>1,596</td>
</tr>
<tr>
<td>2020</td>
<td>232</td>
<td>291</td>
<td>577</td>
<td>826</td>
<td>497</td>
<td>1,684</td>
<td>1,706</td>
</tr>
<tr>
<td>2025</td>
<td>348</td>
<td>388</td>
<td>654</td>
<td>905</td>
<td>600</td>
<td>1,869</td>
<td>1,633</td>
</tr>
<tr>
<td>2030</td>
<td>458</td>
<td>515</td>
<td>742</td>
<td>991</td>
<td>708</td>
<td>2,051</td>
<td>1,537</td>
</tr>
</tbody>
</table>
Dimension of Locks and New-Panamax vessels

Existing Locks Max Vessel: 4,400 TEU’s

Current Locks

Beam 49 m (160’)

New Locks

LENGTH 366 m (1,200’)

New Locks Max Vessel: 12,600 TEU’s

Source: Panama Canal Authority (ACP)
Depth-Constrained Containership Calls in 2020, with and without Planned Harbor Projects
(in thousands of ship calls)

As of 2009:
- Construction / Design Funds
- Authorized – Funds Pending
- Study Funds
- Under Construction/Study for Additional Improvements

Year 2000
Year 2020 (with planned projects)
Year 2020 (without planned projects)
U.S. Port and Inland Waterways Modernization Strategy

As directed by Congress:

Within the funds provided, the Institute for Water Resources is directed to submit to the Senate and House Committees on Appropriations within 180 days of enactment of this Act, a report on how the Congress should address the critical need for additional port and inland waterway modernization to accommodate post-Panamax vessels. This study will not impede nor delay port or inland waterway projects already authorized by Congress. Factors for consideration should include costs associated with deepening and widening deep-draft harbors; the ability of the waterways and ports to enhance the nation's export initiatives benefitting the agricultural and manufacturing sectors; the current and projected population trends that distinguish regional ports and ports that are immediately adjacent to population centers; the availability of inland intermodal access; and the environmental impacts resulting from the modernization of inland waterways and deep-draft ports.

- Conference Report on the Consolidated Appropriations Act of 2012 (H.R. 2055)
Strategy Will Incorporate

- Shipper Perspectives
- Carrier Perspectives
- Ports Perspectives
- Environmental Interests
- State and Federal Agencies
- Other Groups
Teams

- Deep Draft Center of Expertise
- Inland Center of Expertise
- Environmental Team
- Dredging Team
- AIS Team
- Port Capacity Team
- Public Communications Team
Deep Draft PCX

- Forecasting International Trade and Future Container Vessel Fleet

- Trends that distinguish regional ports and ports which are immediately adjacent to large population centers
Inland PCX

- Commodity Flows (esp. grain & oilseeds)
- Trade Initiatives
- Waterway Fleets & Costs
- Profiles
  - Waterways, Ports, Rail, Truck System
- Base and Future Condition Report
Major Freight Corridors

Note: Highway & Rail is additional highway mileage with daily truck payload equivalents based on annual average daily truck traffic plus average daily intermodal service on parallel railroads. Average daily intermodal service is the annual tonnage moved by container-on-flatcar and trailer-on-flatcar service divided by 365 days per year and 16 tons per average truck payload.

Marine Highway Corridors
Environmental Team

- Impacts from:
  - Excavation and Maintenance Dredging
  - Port and Inland Waterway Structures
  - Vessel, Port and Waterway Operations
  - Intermodal Transport Development and Operation
  - Accidents
  - Impact Distribution and Environmental Justice
Dredging Team

- Examine impact on the Corps’ overall dredging program (both for O & M and New Starts).

- Reviewing budget history, establishing candidate dredging projects; determining existing info on dredging projects (channel lengths, dredging quantities, material type and dredging method and placement); computing cost estimates, and verification by Districts for parameters.
AIS Contract

- Route analyses
- Voyage costs
- Examine vessel trends and cascading effects
- Provides insights into the post Panama Canal Expansion
Port Capacity Assessment

- What are the near-term and long-term capacities of the major container ports?
- What factors constrain the capacities of those ports?
- How well is capacity currently utilized?
- How well are the major ports prepared to handle larger vessels?
- How do the smaller container ports or terminals fit into the picture?
Public Communications Team

- Ensure that USACE conducts its investigation and communicates the findings in a clear, transparent, and sensitive manner to ensure consideration of viewpoints of all stakeholders and to promote positive perceptions of the study and study process.
Uncertainties Which May Impact Investment Decisions

- Future trade growth rate
- Future vessel fleet – and where will they call?
- Panama Canal expansion – implications for vessel routings
- Use of Transshipment Hubs – Bahamas? Caribbean?
- Stimulus funds accelerated some projects, but then funding uncertain
- Future funding levels may be constrained by growing federal deficit
Challenge: Inland Waterway O&M Funding
1977-2010 Current $ and 1996 Constant $ *

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

* Fuel-Taxed Waterways Only

Lock wall, Lower Mon 3

* Lock wall deterioration.
Chickamauga
### Navigation Funding – Pres Budget

($ million)

<table>
<thead>
<tr>
<th>Pres Bud</th>
<th>Coastal</th>
<th>Inland</th>
<th>Nav</th>
<th>CW total</th>
<th>Nav Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY12</td>
<td>$832</td>
<td>$744</td>
<td>$1576</td>
<td>$4631</td>
<td>34</td>
</tr>
<tr>
<td>FY11</td>
<td>$873</td>
<td>$779</td>
<td>$1652</td>
<td>$4939</td>
<td>33</td>
</tr>
<tr>
<td>FY10</td>
<td>$971</td>
<td>$796</td>
<td>$1767</td>
<td>$5125</td>
<td>35</td>
</tr>
<tr>
<td>FY09</td>
<td>$969</td>
<td>$931</td>
<td>$1900</td>
<td>$4741</td>
<td>40</td>
</tr>
<tr>
<td>FY08</td>
<td>$957</td>
<td>$1057</td>
<td>$2014</td>
<td>$4900</td>
<td>41</td>
</tr>
</tbody>
</table>

Trend is declining funds
Navigation down 22% in the last 5 years.
Reductions masked by ARRA funding in FY09 and FY10
Flood Damage Reduction increased due to DSAC results;
Environment also increased.
U.S. Port and Inland Waterways Modernization Strategy

- **National Export Initiative** seeks to increase exports through trade missions, export credit and financing, effort to remove trade barriers, enforcing trade rules and promoting international policies that lead to balanced world growth.

- The Corps’ Modernization Strategy needs to be in context with ongoing efforts and reflex a multimodal transportation system.
Options for Financing Modernization

From greater Federal role to more reliability on local resources. Between these two end points are an infinite combination of PPP, use of infrastructure banks, alternative cost sharing and fee structures.
U.S. Port & Inland Waterways Modernization Strategy

Schedule

- December 2011: Authorized by Congress
- Jan – Apr 2012: Report Drafted
- 30 June 2012: Report Delivered to Congress
Questions?

Kevin Knight
Institute for Water Resources
(703) 428-7250
Kevin.P.Knight@usace.army.mil

Keith Hofseth
Institute for Water Resources
(703) 428-6468
Keith.D.Hofseth@usace.army.mil
Line of Site Requirements Restrict Vessel Capacity