Bottom Line Up Front

• U.S. population growth increasing 100 million within 30 years
• U.S. imports and exports projected to increase significantly
• Worldwide numbers of post-Panamax vessels increasing
• Opportunities for economically justified port expansion are expected to be greatest along the Southeast and Gulf coasts
  – Corps is conducting 17 port specific studies to identify expansion needs
• Increased grain exports through the Gulf can be expected as a result of transportation cost savings associated with the use of larger vessels
  – The capacities of the Inland Waterways serving the export market needs to be maintained to take advantage of this opportunity
• Population and incomes are growing worldwide and within the U.S. (32% increase within 30 years).
• Trade follows growth in population and income. It has increased 100-fold since 1950.
• Imports expected to grow more than fourfold and exports expected to grow more than sevenfold over 30 years.
In the U.S. population growth is expected to be greatest in the South and West.

Source: U.S. Census Bureau, Population Division; 2005 Interim State Population Projections

Figure 5: Percent Change in Population by Region of U.S. 2010-2030

Figure 6: Change in Population by U.S. Region 2010-2030
Post Panamax vessels will increase by 59% by 2030.

Table 1: Unconstrained Forecast of TEU Capacity as a Percent of Total by TEU Band 2012-2030

<table>
<thead>
<tr>
<th>Vessel Size</th>
<th>2012</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 k TEU to 1.3k TEU</td>
<td>8%</td>
<td>6%</td>
<td>6%</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>1.3 k to 2.9 k TEU</td>
<td>18%</td>
<td>15%</td>
<td>14%</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>c 2.9 k to 3.9 k TEU</td>
<td>7%</td>
<td>6%</td>
<td>6%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>d 3.9 k to 5.2 k TEU</td>
<td>21%</td>
<td>19%</td>
<td>17%</td>
<td>15%</td>
<td>14%</td>
</tr>
<tr>
<td>e 5.2 k to 7.6 k TEU</td>
<td>19%</td>
<td>18%</td>
<td>17%</td>
<td>16%</td>
<td>15%</td>
</tr>
<tr>
<td>f 7.6 k to 12 k TEU</td>
<td>17%</td>
<td>20%</td>
<td>20%</td>
<td>21%</td>
<td>21%</td>
</tr>
<tr>
<td>g 12 k TEU +</td>
<td>9%</td>
<td>15%</td>
<td>20%</td>
<td>24%</td>
<td>26%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note: post-Panamax vessel bands shaded in gray
Source: MSI
## Reserve Container Port Capacity by Coast

<table>
<thead>
<tr>
<th>Metric</th>
<th>N. Atlantic Ports</th>
<th>S. Atlantic Ports</th>
<th>Gulf Ports</th>
<th>West Coast Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010 TEU</td>
<td>8,239,000</td>
<td>6,687,000</td>
<td>2,409,000</td>
<td>18,960,000</td>
</tr>
<tr>
<td>Reserve CY Capacity-TEU</td>
<td>10,612,402</td>
<td>13,869,035</td>
<td>2,669,003</td>
<td>10,484,996</td>
</tr>
<tr>
<td>Reserve Crane Capacity – TEU</td>
<td>20,895,164</td>
<td>12,501,742</td>
<td>4,423,466</td>
<td>37,237,002</td>
</tr>
<tr>
<td>Reserve Berth Capacity – Vessel Calls</td>
<td>9,964</td>
<td>4,013</td>
<td>1,105</td>
<td>13,923</td>
</tr>
<tr>
<td>Reserve Berth Capacity – Avg. Vessel Basis</td>
<td>11,832,298</td>
<td>1,922,907</td>
<td>2,799,609</td>
<td>53,031,819</td>
</tr>
</tbody>
</table>

*Source: USACE Institute for Water Resources*
## Preliminary Results of AAPA U.S. Port Authority Infrastructure Spending Survey - 2012-2016

<table>
<thead>
<tr>
<th>Port's Projected Capital Expenditures 2012-2016</th>
<th>Projected Private Sector Capital Expenditures at ports 2012-2016</th>
<th>Port's Local Share of Security Expenditures Since 9-11</th>
<th>Port's % of Annual Budget for Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>$16,218,000,000</td>
<td>$21,418,000,000</td>
<td>$1,429,000,000</td>
<td>10.3% (average)</td>
</tr>
</tbody>
</table>

*Source: American Association of Port Authorities*
The Ports along the U.S. Southeast and Gulf coast (where the population growth is expected) are likely candidates for investment to deepen to be "post-Panamax" or "cascade" ready.

**West Coast Post Panamax Ready Ports**
- Seattle
- Oakland
- Los Angeles/Long Beach

**East Coast Post Panamax Ready Ports**
- New York/New Jersey
- Baltimore
- Norfolk
- Charleston

*Figure 21: Main Channel Depths at Selected Ports*
The inland waterways need to be maintained (both channel depth and reliability) to service the opportunities for growth in agricultural exports.

Last decade average annual expenditures $1.5B-$2.0B
ENVIRONMENTAL IMPACTS

The navigation system and port expansion have environmental impacts. Negative impacts must be mitigated. If not fully mitigated, impacts could include:

• degraded air and water quality that threatens human health and safety, especially of low income and minority groups;
• loss of important natural and cultural heritage found in parks, refuges, wetlands and scarce species; and
• loss of recreation, commercial and other economically important resources.

Those mitigation costs can be significant and will play an important role in investment decisions.
Despite the uncertainty in market responses to the deployment of post-Panamax vessels and the expansion of the Panama Canal, individual investment opportunities for port expansion can be identified using established decision making under uncertainty techniques.

Adaptive management techniques can also be used to address uncertainty issues.

Preliminary estimates indicate the total investment opportunities may be in the $3-$5 billion range.
• The primary challenge with the current process to deliver navigation improvements is to ensure adequate and timely funding to take advantage of potential opportunities.

  o A notional list of financing options is presented to initiate discussion of possible paths to meet this challenge

  o It is anticipated that a variety of options may be desirable, and in all cases individual project characteristics, including its economic merits, would need to be considered in selecting the optimal financing mechanisms.
Questions and Comments?

Contact the team:

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Website