Planning Your Port’s Role in an Uncertain Future

Presented By
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Williamsburg, Virginia
International Port External Industry Pressures Driving Today’s Logistics
More than 98% of everything we consume, wear, eat, drive and construct is brought to us via ships through the North American port system.
Relationship Between US Trade and US Prosperity – 1930 to 2005
(US Trade & Gross Domestic Product - $ Billions)

Source: USDOT Based on USDOC Data
What We Know Today... Will Surely Be Different Tomorrow!
To Be Competitive Today...
Marine/Intermodal Terminals Must **Reduce** Throughput **Cost** & **Increase** Cargo Velocity
Securely and as Stewards of the Environment
Who Decides Where the Cargo Goes?
Who Owns & Controls Today’s Cargo?

• The “Shipper” or “Beneficial Cargo Owner” (BCO)

• BCO = Importer of record, the entity that physically takes possession of cargo at destination and does not act as a third party in the movement of such goods

• The person or company who is usually the supplier or owner of commodities shipped.
The Speed of Shipper – BCO Decisions Today:

**E-Commerce Tools Speed Trade Decisions Instantly:**

- **Freight Planning and Optimization** - Electronic Tender Management Tools: Rapidly gather & analyze multiple freight logistics bids instantly.

- **Data Visibility** - Shipment data is available electronically via the Web or Desktop E-tools, in real-time or close to it.
Poll of the Top 1000 “Blue Chip” Multinational Shipper Priorities

- 43% Schedule Reliability & Consistency
- 38% Competitive Freight Rate
- 12% Transit Time & Speed
Today's Logistics Truth:

“The customer wants more and is willing to pay less for it.”
Functional Classification of Global Maritime Cargoes

- **All Maritime Cargo**
  - **General Cargo**
    - **Break Bulk**
      - Sacks, Cartons, Crates, Drums, Pallets, Bags
    - **Neo-Bulk**
    - **Containerized**
      - Containers, Lift On/Lift Off (Lo/Lo), Roll On/Roll Off (Ro/Ro)
    - **Liquid Bulk**
      - LNG, Petroleum, Molasses, Chemicals, Vegetable Oil
    - **Dry Bulk**
      - Grain, Sand & Gravel, Scrap Metal, Coal/Coke, Clinker, Fertilizer

- **Bulk Cargo**

### What is the Value of a Single Container Load?

(Example 40 ft. Container, FEU)

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Total Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>1,890</td>
<td>$25.50/Case</td>
<td>$48,195</td>
</tr>
<tr>
<td>Packs</td>
<td>432,000</td>
<td>$4.00/Pack</td>
<td>$1,728,000</td>
</tr>
<tr>
<td>Pairs</td>
<td>10,000</td>
<td>$30/pair</td>
<td>$300,000</td>
</tr>
<tr>
<td>20” TVs</td>
<td>315</td>
<td>$299/TV</td>
<td>$94,185</td>
</tr>
</tbody>
</table>

**Source:** Virginia Port Authority
International Maritime Cargo Demand Trends
Global Shipping Routes Plotted by AIS GPS

2010 Busiest Routes:
(1) Panama Canal, (2) Suez Canal, (3) Shanghai Port

Shorter – Faster Arctic Ocean Route

2+ Months A Year Using Convoys

Half the Time & Distance
Emerging Markets Lead the Global Recovery

Source: IHS Global Insight – World Trade Service

BRIC Countries

Including US & Canada
A Turning Point in Global Economic History

The Advanced Economies Will Decline From 2/3 share of the Global Economy to a 1/3 Global Share. The Global Economy Will See Higher Average Pace of Growth in the Future…

Source: IMF - Forecast by TD Economics, December 2009
Growth in Global Merchandise Trade
(Intra Europe Trade Excluded)

(Trillions of U.S. dollars)

Source: IHS Global Insight – World Trade Service
Southeast Asian Manufacturing Centroid Shift

Current Inbound U.S. Cargo Flow

Expanded Asian Panama Canal 2014 Flows

Eastbound: All Water Flow

Eastbound: US Intermodal Rail Flow

US Intermodal Rail Flow

Western Centroid Shift
With Manufacturing Centroid Shifts Into Vietnam and/or India, The North American East Coast will See Dramatically More Westbound Suez Traffic.
2014 Suez Canal Pricing Strategy:
The Suez Canal has an opportunity to competitively alter global shipping patterns by undercutting 2014/15 Panama Canal new pricing strategy.
The World’s Top 20 Ports Posted a 15.1% Volume Growth in 2010 (2009 Rank in Brackets)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Port</th>
<th>MTeu (Change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shanghai</td>
<td>29.07 16%</td>
</tr>
<tr>
<td>2</td>
<td>Singapore</td>
<td>28.43 10%</td>
</tr>
<tr>
<td>3</td>
<td>Hong Kong</td>
<td>23.53 12%</td>
</tr>
<tr>
<td>4</td>
<td>Shenzhen</td>
<td>22.51 23%</td>
</tr>
<tr>
<td>5</td>
<td>Busan</td>
<td>14.21 19%</td>
</tr>
<tr>
<td>6</td>
<td>LA/LB</td>
<td>14.10 19%</td>
</tr>
<tr>
<td>7</td>
<td>Ningbo</td>
<td>13.14 25%</td>
</tr>
<tr>
<td>8</td>
<td>Guangzhou</td>
<td>12.55 12%</td>
</tr>
<tr>
<td>9</td>
<td>Qingdao</td>
<td>12.01 17%</td>
</tr>
<tr>
<td>10</td>
<td>Dubai</td>
<td>11.60 4%</td>
</tr>
<tr>
<td>11</td>
<td>Rotterdam</td>
<td>11.14 14%</td>
</tr>
<tr>
<td>12</td>
<td>Tianjin</td>
<td>10.08 16%</td>
</tr>
<tr>
<td>13</td>
<td>Kaohsiung</td>
<td>9.18 7%</td>
</tr>
<tr>
<td>14</td>
<td>Port Klang</td>
<td>8.87 21%</td>
</tr>
<tr>
<td>15</td>
<td>Antwerp</td>
<td>8.47 16%</td>
</tr>
<tr>
<td>16</td>
<td>Hamburg</td>
<td>7.94 13%</td>
</tr>
<tr>
<td>17</td>
<td>Tg Pelepas</td>
<td>6.53 8%</td>
</tr>
<tr>
<td>18</td>
<td>Xiamen</td>
<td>5.82 24%</td>
</tr>
<tr>
<td>19</td>
<td>Dalian</td>
<td>5.24 15%</td>
</tr>
<tr>
<td>20</td>
<td>Laem Chabang</td>
<td>5.19 12%</td>
</tr>
</tbody>
</table>

2010: 260 Million TEUs

2009: 226 Million TEUs

This Recovery Reflects the Rebound in Global Container Trade Due Primarily to Intra-Asia Volumes and Supply Chain Inventory Restocking.

- **US Ports**: [Green Bar/Box]
- **Chinese Ports**: [Red Bar/Box]
Of the 10 busiest ports in the world in 2010, Nine are in Asia; of the top 10, Six are on the Chinese mainland.

The Port of Shanghai is No. 1, and The Port of Singapore is No. 2.
Singapore vs. Shanghai Container Volumes
2000 through 2010 Volumes in Millions of TEUs

- **Total 2010 US Port Volume (14.7m)**
- **Singapore: 5.2% CAGR**
- **Shanghai: 17.9% CAGR**

Source: Alphaliner Newsletter Volume 2011 Issue 2
Full Global Recovery:
Singapore-based PSA posted a 14.4 percent increase in throughput in 2010

65.12 million TEUs handled by the PSA Group, a new record for the Singapore (4.4 x total US volume)

Port Operator PSA International Reported its net profit for 2010 rose 20.8 percent to S$1.2 billion.
Global Market Economic Shifts

<table>
<thead>
<tr>
<th>Year</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>USA/CA</td>
<td>USA/CA</td>
<td>USA/CA</td>
<td>USA/CA</td>
<td>USA/CA</td>
<td>CHINA</td>
</tr>
<tr>
<td>Japan</td>
<td>Japan</td>
<td>CHINA</td>
<td>CHINA</td>
<td>CHINA</td>
<td>USA/CA</td>
<td>CHINA</td>
</tr>
<tr>
<td>Germany</td>
<td>Germany</td>
<td>Japan</td>
<td>Japan</td>
<td>INDIA</td>
<td>INDIA</td>
<td>INDIA</td>
</tr>
<tr>
<td>#2</td>
<td>Brazil</td>
<td>INDIA</td>
<td>Russia</td>
<td>France</td>
<td>Germany</td>
<td>Germany</td>
</tr>
<tr>
<td>#3</td>
<td>INDIA</td>
<td>Russia</td>
<td>Italy</td>
<td>Brazil</td>
<td>France</td>
<td>France</td>
</tr>
<tr>
<td>#4</td>
<td>Russia</td>
<td>Brazil</td>
<td>Brazil</td>
<td>Italy</td>
<td>Italy</td>
<td>Italy</td>
</tr>
</tbody>
</table>

Dramatic Market Shifts are Underway that will Affect the Very Core of US Trade and Transportation

Source: HIS Global Insight
China: New World Economic Engine

Population:
US: 307 million
China: 1,338 million
(1/5 World)

The number of Chinese children in elementary school is equivalent to the total US population.
Shanghai International Shipping Center
Yangshan Deep Port & Logistics Park

New Port City
New Logistics Park

20 Mile New Port Access Bridge Constructed in 3 yrs

54 New Berths
Shanghai International Shipping Center
Yangshan Deep Port - 20 Mile Bridge Access

“Second Longest Ocean Bridge in the World”
Shanghai Yangshan Deep-Water Harbour
Yangshan Deep Port – 54 Berths East China Sea
New Emerging Economic Global Drivers
(BRIC → ASEAN 2014) + India
### Huge Population Growth Over Next Decade

**Top 10 countries to add 422 million people by 2020**

<table>
<thead>
<tr>
<th>Country</th>
<th>2010</th>
<th>2020</th>
<th>Nominal Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>1,173,108,018</td>
<td>1,326,093,247</td>
<td>152,985,229</td>
<td>13.0%</td>
</tr>
<tr>
<td>China</td>
<td>1,330,141,295</td>
<td>1,384,545,220</td>
<td>54,403,925</td>
<td>4.1%</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>88,013,491</td>
<td>120,420,018</td>
<td>32,406,527</td>
<td>36.8%</td>
</tr>
<tr>
<td>USA</td>
<td>310,232,863</td>
<td>341,386,665</td>
<td>31,153,802</td>
<td>10.0%</td>
</tr>
<tr>
<td>Nigeria</td>
<td>152,217,341</td>
<td>182,344,492</td>
<td>30,127,151</td>
<td>19.8%</td>
</tr>
<tr>
<td>Pakistan</td>
<td>177,276,594</td>
<td>204,274,257</td>
<td>26,997,663</td>
<td>15.2%</td>
</tr>
<tr>
<td>Congo</td>
<td>70,916,439</td>
<td>95,605,489</td>
<td>24,689,050</td>
<td>34.8%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>242,968,342</td>
<td>267,532,450</td>
<td>24,564,108</td>
<td>10.1%</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>158,065,841</td>
<td>180,753,264</td>
<td>22,687,423</td>
<td>14.4%</td>
</tr>
<tr>
<td>Brazil</td>
<td>201,103,330</td>
<td>222,607,506</td>
<td>21,504,176</td>
<td>10.7%</td>
</tr>
</tbody>
</table>
## Asian Hourly Wage Rates in US Dollars

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>China</strong></td>
<td>1.56</td>
<td>1.63</td>
<td>1.83</td>
<td>2.16</td>
<td>2.51</td>
<td>2.90</td>
<td>3.19</td>
<td>3.66</td>
</tr>
<tr>
<td><strong>Hong Kong</strong></td>
<td>7.24</td>
<td>7.27</td>
<td>7.42</td>
<td>7.64</td>
<td>7.95</td>
<td>8.27</td>
<td>8.68</td>
<td>9.11</td>
</tr>
<tr>
<td><strong>India</strong></td>
<td>0.50</td>
<td>0.49</td>
<td>0.53</td>
<td>0.57</td>
<td>0.61</td>
<td>0.66</td>
<td>0.72</td>
<td>0.78</td>
</tr>
<tr>
<td><strong>Indonesia</strong></td>
<td>0.51</td>
<td>0.51</td>
<td>0.59</td>
<td>0.67</td>
<td>0.77</td>
<td>0.88</td>
<td>0.98</td>
<td>1.08</td>
</tr>
<tr>
<td><strong>Japan</strong></td>
<td>24.30</td>
<td>26.23</td>
<td>22.59</td>
<td>21.70</td>
<td>20.41</td>
<td>19.81</td>
<td>19.51</td>
<td>18.73</td>
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<tr>
<td><strong>South Korea</strong></td>
<td>13.21</td>
<td>11.27</td>
<td>13.31</td>
<td>14.54</td>
<td>16.49</td>
<td>18.70</td>
<td>20.91</td>
<td>23.38</td>
</tr>
<tr>
<td><strong>Malaysia</strong></td>
<td>2.99</td>
<td>2.80</td>
<td>2.97</td>
<td>3.18</td>
<td>3.38</td>
<td>3.58</td>
<td>3.80</td>
<td>4.03</td>
</tr>
<tr>
<td><strong>Philippines</strong></td>
<td>1.65</td>
<td>1.59</td>
<td>1.67</td>
<td>1.77</td>
<td>1.87</td>
<td>1.99</td>
<td>2.11</td>
<td>2.24</td>
</tr>
<tr>
<td><strong>Singapore</strong></td>
<td>13.18</td>
<td>12.86</td>
<td>13.18</td>
<td>13.85</td>
<td>14.69</td>
<td>15.59</td>
<td>16.53</td>
<td>17.54</td>
</tr>
<tr>
<td><strong>Taiwan</strong></td>
<td>7.24</td>
<td>6.56</td>
<td>6.95</td>
<td>7.19</td>
<td>7.50</td>
<td>7.85</td>
<td>8.19</td>
<td>8.52</td>
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<tr>
<td><strong>Thailand</strong></td>
<td>1.08</td>
<td>1.06</td>
<td>1.04</td>
<td>1.08</td>
<td>1.19</td>
<td>1.27</td>
<td>1.35</td>
<td>1.42</td>
</tr>
<tr>
<td><strong>Vietnam</strong></td>
<td>0.81</td>
<td>0.86</td>
<td>0.87</td>
<td>0.89</td>
<td>0.97</td>
<td>1.03</td>
<td>1.07</td>
<td>1.10</td>
</tr>
</tbody>
</table>

Source: JOC, IMA Asia – Asia Forecasts 2010
India’s Current & Planned Container Port Developments

Majority of New Indian Container Port Capacity Favors Southeast Asian Continual Centroid Shift to the WEST

Source: Alphaliner Volume 2012 Issue 14
VIETNAM – Has Become the Apparel Distribution Capital of the World – The “Apparel Shipper”

VIETNAM - Ho Chi Minh City, (Saigon) Bitexco Financial Tower
The Astounding Ocean Marine Carrier Industry Comeback
2009 Carrier Losses: Container Ocean Carriers Suffered $52 Million/Day Average Loss

Shoals of Red Ink: $19 Billion in Losses in 2009
In 2009 the Ocean Carriers Lost $10 Billion Every Six Months

Jan-Sept 2009 vs 2008

Note: MSC’s US Import Volume was Flat Through the First Nine Months of 2009

Source: JOC Top 40 Container Lines, PIERS Global Intelligence Solutions
2010: Total Revenues Rising 42%; Total Container Handlings Increased by 14%; Freight Rates Increased 26%

Source: Alphaliner Newsletter Volume 2011 Issue 16
2011 Top Containership Carriers
(Monthly Change in Operating Capacity (TEUs))

Source: Alphaliner Newsletter Volume 2011 Issue 16
North American Cargo Demand Trends
(Déjà vu Experience)
(West Coast Ports Handle 63% of Imports)

Source: CSX Transportation May 12, 2011 - Director of Strategic Analysis
Transpacific Container Trade Recovery
(Millions of TEUs)

“Note the 2 to 1 Asian Import Imbalance”

Source: IHS – Global Insight - The Global Outlook – October 14, 2010
Transatlantic Container Trade Recovery

(Millions of TEUs)

Source: IHS – Global Insight - The Global Outlook – October 14, 2010
San Pedro Bay (POLA +POLB) Container Volume Forecast

344% Increase by 2035 From 2009 Levels

Source: IHS Global Insight 2010 Forecast
In calendar 2010, 40-footers led year-over-year growth at 19.5 percent, followed by 20-footers at 19 percent and 53-footers, 16.2 percent.

Source: Intermodal Association of North America, 2012
2011 US Manufactured Goods

U.S. Manufactured goods trade increased 11.7 percent year-over-year during calendar 2011, with exports up 11.3 percent and imports, 11.8 percent.

Source: US Department of Commerce, US Census Bureau, Foreign Trade Div
U.S. agricultural commodities trade increased 19 percent year-over-year during calendar 2011, with exports up 17.7 percent and imports, 20.9 percent.

Source: US Department of Commerce, US Census Bureau, Foreign Trade Div
US Agricultural Trade Value Forecast

Source: USDA Economic Research Service - USDA Agricultural Projections to 2021

2008 - 2009 Recession

Exports
Imports

Billion dollars

Source: USDA Agricultural Projections to 2021, February 2012.
USDA, Economic Research Service.
North American Emerging Mega-Regions

Future US Growth Areas

Midwest
Converging Mega Consumption Zones

Source: America 2050 Prospects - Regional Plan Association
US Biomass Resources Epicenter

2035 Intermodal Rail Car Volumes

If Chicago was a Port, it would be the largest in North America
CSX & NS National Expansion of Integrated Intermodal Rail Logistics Centers

Recent Midwest Intermodal Rail Hubs

- Cascadia
- Northern California
- Southern California

NG Opportunities
Existing flows
National Gateway Projects
NW Ohio Intermodal Transfer Hub

Norfolk Southern
CSX

Florida
Northeast
Southwest
Maritime Vessel Technology Trends
April 26, 1956

In 1955 Malcolm McLean, sold McLean Trucking, and secured a bank loan of US$42 million to build the world’s first container ship.

58 Modified 35-foot Truck Containers

April 2006: 50 Year Anniversary of the Container
World Container Ship Evolution

1st Generation (Pre-1960 - 1970)
- Ideal X

- Full Cellular

3rd Generation (1985)
- Panamax

- Post Panamax

5th Generation (2000 - 2006)
- Super Post Panamax

6th Generation (2006 - 2012)
- Ultra Post Panamax

TEU Capacity
- 101 TEU – (58 - 35 ft Containers)
- 2,305 TEU
- 3,220 TEU
- 4,848 TEU
- 8,600 TEU
- 15,000+ TEU

Copyright © 2012
Madison Maersk (3,928 TEUs) in the Panama Canal

(Current Max Panamax Vessel Approx. 4,800 TEUs)
Maersk’s New 30 Vessels (ordered) are 4 Times the Current Size of the Panama Canal & 1.5 times the Size of the Expanded Panama Canal

<table>
<thead>
<tr>
<th>Year</th>
<th>Class</th>
<th>TEU</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>Triple-E Maersk Class</td>
<td>18,000</td>
</tr>
<tr>
<td>2006</td>
<td>Emma Maersk Class</td>
<td>15,500</td>
</tr>
<tr>
<td>1997</td>
<td>Sovereign Maersk class</td>
<td>8,100</td>
</tr>
<tr>
<td>1996</td>
<td>Regina Maersk class</td>
<td>7,100</td>
</tr>
</tbody>
</table>

23 Containers Wide – 9 Tiers Above the Hatch
21,000 TEU Ultra Large Twin Engine Container Ship - 2011

Source: Alphaliner Newsletter Volume 2011 Issue 4
Containership Orders – Country of Build
(Orders Since January 2010)

Source: Alphaliner Newsletter Volume 2011 Issue 21
Record New Container Ship Delivery > 10,000 TEUs
(11 Vessels now 13,000 to 14,000 TEUs)

132 New Containerships > 10,000 TEUs

Source: Alphaliner Volume 2012 Issue 14
The Size of Container Ships to Come
(Average Containership size by Trade Route)

Expect Much Larger Containerships

Source: Alphaliner Volume 2012 Issue 14
Largest Container Vessel to Dock at a North American Port – March 21, 2012

MSC Fabiola (12,562 TEUs) at the Port of Oakland Built in Korea 2010

Length Overall (LOA): 366.08M - 1,201 Ft
Breadth: 48.2M – 158 Ft
Maximum water draft (fully loaded): 15.50M - 50.85 Ft
Deadweight Tonnage: 146,093 metric tons

25% Larger Than Any Other North American Vessel Call

Future Mega Container Vessel Characteristics:

Capacity = up to **22,000 TEUs**

Deck Stow: **23 wide & 7-9 Containers above hatch**

Length = up to **1,445 ft (4.5 Football Fields)**

Beam = up to **194 ft**

Deadweight Tonnage = **220,000 Long Tons**

Draft = up to **54 ft**

*Far Exceeds the 2014/15 Panama Third Lane Capacity*
Vessel Size Expansion - Terminal Impacts
(Port Terminal Infrastructure & Equipment Geometry Impacts)

Source: Georgia Ports Authority and Vickerman & Associates

New Panamax (2014/15) 12,600 TEU
Current Panamax 4,800 TEU
Super Post Panamax 18,000 to 22,000 TEU
Depths 48 to 54 ft

Increased Terminal Throughput
Height Above Deck
Storage Area Impacts

Boom Outreach
Future Container Vessel: NYK Super Eco Ship
Panama Canal Expansion: New Capacity
Panama Canal Historical Tonnage Traffic

Source: ACP Data
Panama Canal Current
Width: 13 Containers Across
Panama Canal Third Lane Expansion
Circa December 2014/January 2015
Panama Canal Expansion

More than 14,000 ships a year pass through the 50 mile long 1914 manmade Link between the Pacific Ocean & Caribbean Sea carrying 275 million tons of Cargo and $100 billion in container shipping.

A $5.25 Billion Investment in a 3rd Set of Locks Equating to 16% of Panama’s National GDP

Source: ACP Data
Panama Canal Expansion Program Components

Source: ACP Information
Panama Canal Transit & Tonnage Traffic
(Transits and PCUMS Tonnage 1914 to 2009)

Source: ACP Data
The Panama Canal is a Vital Link for US Grain Exports

Source: Fearnleys Research
A Larger Share of Other Vessels Will be Able to Transit the Canal - Fully Loaded

Crude Oil - 0% to 42%

LNG - 10% to 90%

Dry Bulk - 55% to 80%
Panama Canal Third Lane Expansion Capabilities

2011: 4,800 TEU

2014-2015: 12,600 TEU

Source: ACP Expansion Project
The New Post Panamax Capacity Favors All - Water Service Routes with the Following Vessel Characteristics:

- Vessel Capacity: 9,000 to 10,000 TEUs
- Vessel Draft: 46 to 50 feet (tropical fresh water)
- Required Port Channel Depths: 50 to 54 feet
- LOA: 1,000 to 1,200 feet
- Beam: 140 to 160 feet
The Container Ship Colombo Express
(8750 TEU)
Today Only The Port of Virginia Can Handle The New 2015 Panamax Vessels Fully Loaded

Source: Virginia Port Authority (VPA) October 2011
Port Authority of New York & New Jersey Entrance Channel & Harbor Dredging Program
($1.6 Billion Program, Completion December 2014)
Raising of the Bayonne Bridge
(Estimated at $1 billion)

**Future** Clearance: 214 ft

**Current** Clearance: 155.3 ft

Maximum Vessel: 7,000 TEUs

Existing Level 64 feet
Panama Canal
Future Transit
Revenues & Canal Alternatives
Typical Container Vessel Service Route
Asia to USEC: Weekly Service with 8 - 4,320 TEU Vessels
Generating 104 Yearly Transits and $150 million in Annual Canal Transit Fees

Source: ACP Data
### Summary of the Expanded Canal’s Financial Results

- **To 2025 In Millions of Dollars – Annual Fees**

<table>
<thead>
<tr>
<th>Financial Results(^1)</th>
<th>Year 2005</th>
<th>Year 2025</th>
<th>Annual average growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCUMS Tons(^2)</td>
<td>279</td>
<td>508</td>
<td>3.0%</td>
</tr>
<tr>
<td>Transit Revenue</td>
<td></td>
<td>6,101</td>
<td>8.9%</td>
</tr>
<tr>
<td>Other Revenues</td>
<td>92</td>
<td>125</td>
<td>1.5%</td>
</tr>
<tr>
<td>Total Revenues</td>
<td>1,209</td>
<td>6,227</td>
<td>8.5%</td>
</tr>
<tr>
<td>Operating Costs</td>
<td>444</td>
<td>1,016</td>
<td>4.2%</td>
</tr>
<tr>
<td>Fee per Net Ton(^3)</td>
<td>218</td>
<td>668</td>
<td>6.5%</td>
</tr>
<tr>
<td>Public Services Fees(^3)</td>
<td>2</td>
<td>2</td>
<td>0.0%</td>
</tr>
<tr>
<td>Depreciation</td>
<td>61</td>
<td>231</td>
<td>6.8%</td>
</tr>
<tr>
<td>Net Income</td>
<td></td>
<td>4,310</td>
<td>11.6%</td>
</tr>
</tbody>
</table>

**546% Increase**

**890% Increase**

Source: ACP Financial Data
Alternative “Dry Canal” Proposals to Counteract Anticipated Canal Fees/Costs

APM Terminals announced $1 billion Container Port in Costa Rica

China’s proposal: 136-mile “dry canal” (Pacific Port of Buenaventura & Atlantic Coast Port of Cartagena in Colombia.)
Non-Transit Panama Canal “Feeder Services” May Be the Real Boom from the Canal Expansion

Source: ACP and Compare, 2008 Data
Panama Maritime Authority Becomes A Major Transhipment Center

Port Development in Panama

Manzanillo International Terminal (MIT)

Colon Container Terminal

Panama Ports Company – Cristobal

Panama Ports Company Balboa

Source: Panama Maritime Authority

1996: 235 Thousand TEUs
2009: 4.23 Million TEUs
2015: 7.4 Million TEUs
Panama Canal Expansion Impacts: Prediction Scenarios
Panama Canal Vessel Deployments Will Determine New US Logistics Patterns

The Distance to New Orleans and Savannah Via the Panama Canal

A Competitive & Robust Landside Access to the Gateway Port’s Inland Market will be a Key Success Factor!
The Primary North American Competitor to the Panama Canal is the Class I Rail Intermodal System

(Potential Increased Service Offerings and System Capacity)

Source: USDOT Maritime Administration (MARAD) 2009
Post 2015 Expanded Canal: Predicting the Future Impacts for the US East & Gulf Coasts?

IF:

✓ West Coast Ports & Rail become/remain congested…
✓ East Coast Ports Accommodate the big ships…
✓ Canal Cost Remains Price Competitive with Suez…
✓ Cargo Trade Volumes Continue to Increase…
✓ Canal’s infrastructure keeps pace with Growth…

Then:

✓ Global Carriers will route as much traffic via the expanded Panama Canal as it can handle…
Post 2015 Expanded Canal: Predicting the Future Impacts for the US East & Gulf Coasts?

IF:

✓ Panama Canal Tolls are Set to Maximize Revenue and not Container Volumes…
✓ East Coast Ports Can’t Accommodate the big ships – Channel Draft & Terminal Impacts…
✓ Class I Railroads Exert Their “Pricing Flexibility”…
✓ All-Water Time is not competitive for High Value Time Sensitive Intermodal Landbridge Cargo…

Then:
✓ The Panama Canal Market Shift to the East and Gulf Coast May Not Occur at All!
Panama Canal Large Vessel Market Penetration into the US Midwest
Shanghai to North American Destination Transit Times:
(Ocean Transit and Rail Land-Bridge Routings in Days)

Source: Based on Prologis data
Panama Canal’s Designation of “Prime” and “Competitive” Canal Markets Destinations
Dramatic Market Penetration in 2015

Panama Canal *Economies of Scale* with permit
deeper market penetration into the US

Reachable Market:
- 46% of US Population
- 63% of US Population

4,000 TEU ship, all-water.
8,000 TEU ship, all-water.

Indiana at the Epicenter

West Coast Cost Advantage
East Coast Cost Advantage

Source: PB Consultants - CSX Transportation May 12, 2011 - Director of Strategic Analysis
Market Penetration - High Value Goods
($300,000 Per Container – i.e.: Shoes)

Source: PB Consultants - CSX Transportation May 12, 2011 - Director of Strategic Analysis
Cargo Will Flow “Downhill” to the “Lowest Cost - Best Service Levels” (Total Logistics Costs From Origin to Destination)

More Competitive Regions will End up with the Cargo
Inland Ports: Defined – A Convergence of Logistic Trends
Inland Ports Defined
A Convergence of Logistics Trends

- Short Sea Shipping Technology
- Intermodal Rail
- Logistics
- Automation
- Distribution Center
Inland Ports: Europe’s Current Strategy Applications
Rotterdam World Gateway - EUROGATE Builds an Inland Container Port Network

ECT Main Terminal

Maasvlakte 2 Plan

European Shortsea Network

Short Sea Container Inland Port
The Dutch Transport Ministry and Port of Rotterdam Authority (PoRA) signed a Founding Agreement on June 29, 2009.

The Town of Alblasserdam, East of Rotterdam will get a Container Transferium (CT), a Inland Port Container Transfer Facility to be operated by Binnenlandse Container Terminals Nederland (BCTN).

“This is the first time the Port Authority has promoted such a partnership. PoRA to promote transport by rail and water and to shift containers from road to the other modes of transport in order to reduce the number of trucks in the road.”
Dutch Transport Ministry Inland Port Container Transferium (CT) Strategy

(Noord River, Town of Alblaserdam €38 million, open by end-2012)
Dutch Transport Ministry Inland Port Container Transferium (CT) Strategy

(Noord River, Town of Alblasserdam €38 million, open by end-2012)
Emerging Major Inland Port Logistics Centers
Throughput Capacities in Millions of TEUs
BNSF Logistics Park, Joliet, IL

A New Model For Freight Logistics Centers

Wal-Mart’s New 3.4 million SF (78 acres under roof) Import Distribution Center

The Cost of This Import Distribution Center was Paid for by the Savings in Truck Drayage Between the Warehouse & the Intermodal Rail Terminal
The Inland Port:

“With Integrated JIT Delivery: The Inland Port Can Greatly Increase a Region's Freight System Capacity”
Thank You