Planning Your Port’s Role in an Uncertain Future

Presented By
M. John Vickerman
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
US Navy Fast Frigate Circa 2045
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
Current North American Port Capital Spending
2011 International Gross Fixed Capital Formation as a Percent of GDP

(US is 32nd in the World - Below OECD Nations)
ASCE 2013 Report Card for America’s Infrastructure

Ports: C
Railroads: C+
$18.3 billion US Public Ports
Port Capital Expenditures - 2017

- North Atlantic: 32%
- South Atlantic: 11%
- Gulf Coast: 22%
- Great lakes: 10%
- North Pacific: 24%
- South Pacific: 1%

Source: AAPA News Release June 2012 – AAPA Member Survey
$27.6 billion *Private Sector* Port Capital Expenditures - 2017

Source: AAPA News Release June 2012 – AAPA Member Survey
$46 billion Public + Private Port Capital Expenditures - 2017

Source: AAPA News Release June 2012 – AAPA Member Survey
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.
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
Poll of the Top 1000 “Blue Chip” Multinational Shipper Priorities

- Competitive Freight Rate: 38%
- Schedule Reliability & Consistency: 43%
- Transit Time & Speed: 12%
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
- Lumber, Paper, Steel, Autos

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

Lumber, Paper, Steel, Autos

Sacks, Cartons, Crates, Drums, Pallets, Bags

Grain, Sand & Gravel, Scrap Metal, Coal/Coke, Clinker, Fertilizer

Containers, Lift On/Lift Off (Lo/Lo), Roll On/Roll Off (Ro/Ro)

LNG, Petroleum, Molasses, Chemicals, Vegetable Oil

Break Bulk

Neo-Bulk

Containerized

Liquid Bulk

Dry Bulk
The TEU (Twenty Foot Equivalent Unit)

“The Port & Container Shipping Unit of Measure”

1 TEU = One 20 ft. ISO Container
1 FEU = 2 TEUs = One 40 ft. Container
What is the Value of a Single Container Load?
(Example 40 ft. Container, FEU)

1,890 Cases @ $25.50/Case = $48,195

432,000 Packs @ $4.00/Pack = $1,728,000

10,000 Pairs @ $30/pair = $300,000

315 20” TVs @ $299/TV = $94,185

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

Europe

Asia
Emerging Markets Lead the Global Recovery

Source: IHS Global Insight – World Trade Service
Historical Global Container Market Demand
(Millions of TEUs)

North American Growth Lags Other Global Regions

Source: Drewry Shipping Consultants
2025 World Container Port Market Demand
(Millions of TEUs)

10% CAGR from 1990 - 2008
(9.1%) global volume loss for 2009
Recovery in 2010 with 14.8% growth
50% projected rise 2009-2015

Source: Drewry Shipping Consultants October 2011

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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
Southeast Asian Manufacturing Centroid Shift

Current Inbound U.S. Cargo Flow

U.S. Intermodal Rail Flow

Western Centroid Shift

Expanded Asian Panama Canal 2014 Flows

Eastbound: All Water Flow
Eastbound: US Intermodal Rail Flow
With Manufacturing Centroid Shifts Into Vietnam and/or India, The North American East Coast will See Dramatically More Westbound Suez Traffic
2015 Suez Canal Pricing Strategy:
The Suez Canal has an opportunity to competitively alter global shipping patterns by undercutting 2015 Panama Canal new pricing strategy.
The Growing Asian Import Trade Challenge
Of the 10 busiest ports in the world in 2011, 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.

These Two Ports are Larger Than All North American Ports Combined.
# Global Container Port Throughput Growth Rate (11 Main Ports 2008 to 2012)

<table>
<thead>
<tr>
<th>Port</th>
<th>1Q 2012 TEU</th>
<th>Growth 1Q12/10</th>
<th>2011 TEU</th>
<th>Growth 11/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shanghai</td>
<td>7,570,000</td>
<td>4.0%</td>
<td>31,739,900</td>
<td>9.2%</td>
</tr>
<tr>
<td>Singapore</td>
<td>7,536,900</td>
<td>6.6%</td>
<td>29,937,700</td>
<td>5.3%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>5,616,000</td>
<td>2.7%</td>
<td>24,384,000</td>
<td>2.9%</td>
</tr>
<tr>
<td>Shenzhen</td>
<td>5,025,900</td>
<td>-1.2%</td>
<td>22,578,275</td>
<td>0.3%</td>
</tr>
<tr>
<td>Busan</td>
<td>4,097,000</td>
<td>9.8%</td>
<td>16,184,706</td>
<td>14.0%</td>
</tr>
<tr>
<td>Ningbo</td>
<td>3,787,100</td>
<td>11.9%</td>
<td>14,686,200</td>
<td>11.7%</td>
</tr>
<tr>
<td>Qingdao</td>
<td>3,513,300</td>
<td>9.6%</td>
<td>13,020,000</td>
<td>8.9%</td>
</tr>
<tr>
<td>Guangzhou</td>
<td>3,247,300</td>
<td>12.1%</td>
<td>14,400,000</td>
<td>13.4%</td>
</tr>
<tr>
<td>LA/LB</td>
<td>3,181,424</td>
<td>0.6%</td>
<td>14,001,602</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Rotterdam</td>
<td>2,780,439</td>
<td>-3.9%</td>
<td>11,876,921</td>
<td>6.5%</td>
</tr>
<tr>
<td>Tianjin</td>
<td>2,774,700</td>
<td>5.1%</td>
<td>11,500,000</td>
<td>14.1%</td>
</tr>
<tr>
<td>Total 11 Ports</td>
<td>49,130,063</td>
<td>5.0%</td>
<td>204,309,304</td>
<td>7.0%</td>
</tr>
</tbody>
</table>

Source: Alphaliner Newsletter Volume 2012 Issue 17
China-US: Twin Engines of the World

Population:
US: 314 million
China: 1,344 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
“Second Longest Ocean Bridge in the World”
Shanghai Yangshan Deep-Water Harbour
Yangshan Deep Port – 54 Berths East China Sea
Shanghai International Shipping Center
Yangshan Deep Port & Logistics Park

Shanghai Port Set a 2011 Record by Handling over 30 million TEUs
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>
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</thead>
<tbody>
<tr>
<td>China</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>3.20</td>
<td>3.66</td>
</tr>
<tr>
<td>Hong Kong</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>India</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>0.71</td>
<td>0.78</td>
</tr>
<tr>
<td>Indonesia</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>Japan</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>South Korea</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>Malaysia</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>Philippines</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>Singapore</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>Taiwan</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>
</tr>
<tr>
<td>Thailand</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>Vietnam</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
By 2015/16, the ASEAN Economic Community Will Form a Single Regional Common Market with One Manufacturing Base

In 2011, U.S. exports to ASEAN nations broke records – exceeding $76 billion for the first time.
Association of Southeast Asia Nations (ASEAN) 2015 ASEAN CONNECTIVITY

47 **Seaports** Will Be Built Across ASEAN by 2015/16
The Rise of the ASEAN Economies
Vietnam – Has Become the Apparel Distribution Capital of the World – The “Apparel Shipper”

Vietnam - Ho Chi Minh City, (Saigon) Bitexco Financial Tower
North American Cargo Demand Trends

(Déjà vu Experience)
2011 Top 10 US Port Container Volume (1,000s of TEUS)

Source: AAPA 2011 North American Container Traffic – Port Rankings
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

Source: IHS – Global Insight - The Global Outlook – October 14, 2010
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
U.S. Manufacturered 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.
US Agricultural Trade Value Forecast

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

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Billion dollars

Exports
Imports

2008 - 2009 Recession

Source: USDA Agricultural Projections to 2021, February 2012.
USDA, Economic Research Service.
San Pedro Bay (POLA +POLB) Container Volume Forecast

344% Increase by 2035 From 2009 Levels

Source: IHS Global Insight 2010 Forecast
North American Emerging Mega-Regions

Future US Growth Areas

Midwest Converging Mega Consumption Zones

Source: America 2050 Prospects - Regional Plan Association
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
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.

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
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**

- 2013
  - Triple-E Maersk Class
  - 18,000 TEU

- 2006
  - Emma Maersk Class
  - 15,500 TEU

- 1997
  - Sovereign Maersk class
  - 8,100 TEU

- 1996
  - Regina Maersk class
  - 7,100 TEU

23 Containers Wide – 9 Tiers Above the Hatch
CMA-CGM’s Marco Polo – 16,020 TEUs
Built by Daewoo Shipbuilding and Marine Engineering (DSME) in South Korea – January 2013

, 396 metres in length, 54 metres in width, and boasts a draft of 16 metres
CMA-CGM’s Marco Polo – 16,020 TEUs

Built by Daewoo Shipbuilding and Marine Engineering (DSME) in South Korea – January 2013
21,000 TEU Ultra Large Twin Engine Container Ship - 2011

23 Containers Wide

Source: Alphaliner Newsletter Volume 2011 Issue 4
# Containership Orders – Country of Build

(Orders Since January 2010)

<table>
<thead>
<tr>
<th>Country</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>S Korea</td>
<td>139</td>
</tr>
<tr>
<td>China</td>
<td>64</td>
</tr>
<tr>
<td>Taiwan</td>
<td>16</td>
</tr>
<tr>
<td>Philippines</td>
<td>12</td>
</tr>
<tr>
<td>Romania</td>
<td>4</td>
</tr>
<tr>
<td>Japan</td>
<td>2</td>
</tr>
<tr>
<td>Germany</td>
<td>1</td>
</tr>
</tbody>
</table>

Size Range:
- Below 1,000
- 1,000-1,499
- 1,500-1,999
- 2,000-2,999
- 3,000-3,999
- 4,000-5,099
- 5,100-7,499
- 7,500-9,999
- Above 10,000

- 92%

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

**Vessel Size Expansion - Terminal Impacts**

*Port Terminal Infrastructure & Equipment Geometry Impacts*

- **New Panamax (2014/15)**: 12,600 TEU
- **Current Panamax**: 4,800 TEU
- **Super Post Panamax**: 18,000 to 22,000 TEU

**Storage Area Impacts**

**Increased Terminal Throughput**

**Depth**: 48 to 54 ft

*Source: Georgia Ports Authority and Vickerman & Associates*
Slow Steaming & Fuel Oil Consumption
(8,500 TEU Vessels)

Source: Alphaliner Newsletter Volume 2012 Issue 14
Global Idle Containership Fleet 2009 to 2012 – Expected to Decrease 2013

Idle containerships above 5,000 TEU

Size (teu)
- Over 7,500
- 5,000-7,499

Source: Alphaliner Newsletter Volume 2012 Issue 17
Future Container Vessel: NYK Super Eco Ship
Future Container Vessel: NYK Super Eco Ship
MS Oasis of the Seas:
(6,360 passengers, 2,100 crew:
361m LOA, 66m wide,
standing at a height of 72m)
MS Oasis of the Seas:
(6,360 passengers, 2,100 crew:
361m LOA, 66m wide,
standing at a height of 72m)
New Era of LNG Vessels is on the Horizon:
Will LNG be the Fuel of the Future for Shipping?
TODAY: Viking Energy, an LNG-powered offshore supply boat – Courtesy of Eidesvik
These ships will be the largest ships in the world powered primarily by Liquefied Natural Gas (LNG).
TOTE Orders Two New LNG Powered Container Ships & Two RO/RO Conversions: Largest LNG Powered Ships in the World

Two 839-foot Orca-class vessels to liquefied natural gas-diesel dual fuel operation for Seattle-Alaska service and two 764-foot new-builds for the Florida-Puerto Rico trade
Kawasaki Heavy Industries
9,000 TEU container ship
Fuelled by LNG

A new type of LNG tank that provides more space for container cargo.
Germanischer Lloyd (GL) & IHI Marine United Inc. (IHIMU) Concept Study 13,000 TEU Container Vessel Fuelled by LNG

The eFuture 13000C design (©IHIMU)
LNG Vessel Bunkering: North American Ports Are Not Prepared...
Panama Canal Expansion: New Capacity
Panama Canal Historical Tonnage Traffic

Source: ACP Data
The Panama Canal Circa 1914
Panama Canal Current
Width: 13 Containers Across
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 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 2012 Tolls: Annual Revenue for Container Ships in US $ millions & % Canal Share

Total Toll Revenue: $1.85 billion

- Container: 51.9%
- Bulk: 26.6%
- Tanker: 10.6%
- Reefer: 2.7%
- Other*: 8.2%

Source: Panama Canal Authority www.pancanal.com
Panama Canal Third Lane Expansion Capabilities

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 New Panama Canal Workhorse*
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
Maersk Line’s Boycotts the Panama Canal
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
Emerging New Caribbean Transhipment Center
Yearly Container Movement through the Panama Ports

- Total
- Colon Container Terminal
- Manzanillo International Terminal
- Panama Ports, Co. Balboa
- Panama Ports, Co. Cristobal
- PSA (Panama International Terminal)
Non-Transit Panama Canal “Feeder Services” May Be the Real Boom from the Canal Expansion

Source: ACP and Compare, 2008 Data
The Panama Canal Expansion Will Move the Caribbean Transhipment Center Point to Panama
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
## 2025 Summary of Canal’s Financial Results

(To 2025 In Millions of Dollars – Annual Fees)

<table>
<thead>
<tr>
<th>Financial Results</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>

Source: ACP Financial Data

\(^1\) Includes interest income and rent.

\(^2\) Does not include adjustments for taxation, capital expenditures, or capital losses.

\(^3\) Includes net of net loss on sales and leases.
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.)
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!
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
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 Regions Freight System Capacity”
The Unsolicited Proposal to Purchase All of Virginia’s Ports
In April 2012, APMT submitted an Unsolicited Conceptual Proposal to the Commonwealth of Virginia via the 1995 Virginia Public-Private Transportation Act (PPTA) to purchase all of the Port of Virginia's port terminal operations for $4 billion over a 48 year period.
For the First Time in North America, Should a Private Ocean Carrier Control All of a Public Port Authority’s Facilities and Assets?
APM Terminals Operates 10 Major Container Terminals within US Port Authorities
(5 Terminals on the East Coast)

Major Container Terminal Operation

Source: APMT Data
Special Report: Review of Recent Reports on the Virginia Port Authority’s Operations
Consider the Airport Comparison:

If Delta Airlines, the largest airline in the world, operated all the operations and gates at the Richmond Airport, what would United, US Air, American, Jet Blue, and Air Canada do? What would be the impact to competitor flights and services at the airport?
Thank You