The Outlook for the Suez Canal Route & the Asian Trade “Tsunami”

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US Maritime Trade: Current Course & Direction?

Cargo Demands, Capacity, Funding, & Productivity Concerns

North American Ports
North American Maritime Trade: Constant Bearing-Decreasing Range
“The Perfect Storm”: China Imports
Mainland China Container Growth (CAGR)

Mainland China Container Port Throughput

<table>
<thead>
<tr>
<th>Year</th>
<th>Port Throughput (000TEU)</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>18059</td>
<td>30.1%</td>
</tr>
<tr>
<td>2000</td>
<td>23480</td>
<td>17.1%</td>
</tr>
<tr>
<td>2001</td>
<td>27480</td>
<td>35.4%</td>
</tr>
<tr>
<td>2002</td>
<td>37210</td>
<td>27.3%</td>
</tr>
<tr>
<td>2003</td>
<td>47360</td>
<td>25.9%</td>
</tr>
<tr>
<td>2004*</td>
<td>59673</td>
<td></td>
</tr>
</tbody>
</table>

5 Yr Average = 27.2%
China is Leading a Global Economic Rebound becoming the World’s Manufacturing Powerhouse

• Global manufacturing is now centered in China.
• China will double its GDP by 2010 and quadruple it by 2020.
• By 2008 China will be the second largest global trading country.
• China’s cargo, including Hong Kong loadings accounts for 70% of the total Pacific cargo flows.
• China’s container volumes will increase from 60 million TEUs to over 100 million TEUs by 2010.
China’s Ministry of Railways Signed a 5 year Cooperation Agreement with the US BNSF Railroad for Intermodal Rail Development

- Develop China’s high volume efficient intermodal network
- $242 billion program to 2020
- High volume intermodal freight corridors to major ports
- On-dock & near-dock intermodal transfer yards at ports
- Ministry to build 18 mega-terminals with 7 at seaports
Southeast Asian Manufacturing Centroid Shift

Current Inbound U.S. Cargo Flow

U.S. Intermodal Rail Flow

Western Centroid Shift

Eastbound: All Water Flow
Eastbound: US Intermodal Rail Flow
The Suez Canal “Back Flow”
U.S. Intermodal Freight Transportation System is an essential component of our national commercial economy.

This system is at risk...
The North American Freight Paradox: The Nation’s Ports and Their Intermodal Linkages are Experiencing the “Best of Times and the Worst of Times” in Terms of Growth and Demands on Capacity
US Port Capacity Concerns are the Tip of Our Freight Logistics Challenge
International Maritime Cargo Forecast Trends
World Bank’s 2010 “Global Economic Prospects”

World Output will Increase 33% in 10 years

- 2000: $30 Trillion
- 2010: $40 Trillion
2001 World Container Gateways

“The World’s Top 12 Gateways”

Hong Kong Alone is Equal to the Top Seven US Container Ports

31 M TEUs by 2011

Source: AAPA, Containerisation International Yearbook

Rank 1 2 3 4 5 6 7 8 9 10 11 12

Hong Kong 17.1
Singapore 18.1
Kaohsiung 8.2
Rotterdam 7.0
Busan 6.4
Shanghai 6.3
Hamburg 4.2
Antwerp 3.7
Dubai 3.6
Manila 2.8
 NY/NJ 2.7

US Ports

Source: AAPA, Containerisation International Yearbook

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The Container Industry Continues to Consolidate...

- Total number of slots
- Slots controlled by top 20 carriers
- Slots controlled by 4 global alliances

Years: 1984, 1995, 2000

1984:
- Total: 1,976
- Top 20 carriers: 744
- Global alliances: 1,232

1995:
- Total: 5,053
- Top 20 carriers: 2,244
- Global alliances: 2,809

2000:
- Total: 8,180
- Top 20 carriers: 4,850
- Global alliances: 3,330

Percentages:
- 1984: 744 / 1,976 = 37.7%
- 1995: 2,244 / 5,053 = 44.4%
- 2000: 4,850 / 8,180 = 59.2%
Panama Canal Vessel Forecast Transits

In 1980
Container #4

In 2040
Container #1

Source: Panama Canal Commission/ICF Kaiser, June 1997
Approximately 75% of All General Cargo is Containerized
By 2020 Most US Container Port Gateways Will Double or Triple in Volume

U.S. Containerized Tonnage Forecast

Total 79.2 119.5 188.7 236.6 355.6 7.8%

CAGR

By 2020 Most US Container Port Gateways Will Double or Triple in Volume

Source: DRI/McGraw Hill
2003 US Port Container Throughput by Coast

Source: Computed from Seaports of the Americas – 2003, Containerization International Yearbook - 2003 and port-provided data bases/interviews
International Port Productivity
Global Port Terminal Productivity

North American Ports Are Not As Productive As The Most Productive International Ports By a Factor Of More Than 4 To 1
# Global Marine Terminal Productivity Growth

(Circa 1995 to 2003)
(Throughput measured in TEUs/Acre/Year)

<table>
<thead>
<tr>
<th>Region</th>
<th>1995</th>
<th>2003</th>
<th>5YR CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asian Ports</strong></td>
<td>8,834</td>
<td>18,500</td>
<td>19.9%</td>
</tr>
<tr>
<td><strong>European Ports</strong></td>
<td>2,974</td>
<td>6,800</td>
<td>9.2%</td>
</tr>
<tr>
<td><strong>United States Ports</strong></td>
<td>2,144</td>
<td>3,900</td>
<td>9.0%</td>
</tr>
<tr>
<td><strong>US West Coast Ports</strong></td>
<td>3,567</td>
<td>4,300</td>
<td>10.9%</td>
</tr>
<tr>
<td><strong>US Gulf Coast Ports</strong></td>
<td>2,816</td>
<td>4,000</td>
<td>3.7%</td>
</tr>
<tr>
<td><strong>US East Coast Ports</strong></td>
<td>1,281</td>
<td>3,300</td>
<td>10.3%</td>
</tr>
</tbody>
</table>

Source: 1995 & 2003 CI Yearbooks, Seaports of the Americas, Port Data
2003 International Port Productivity
Top 10 Ports in Millions of TEU Throughput

Source: Computed from Seaports of the Americas – 2003,
Containerization International Yearbook - 2003 and port-provided data bases/interviews
2003 US Port Productivity Top 10 Ports in TEUs of Throughput

Source: Computed from Seaports of the Americas – 2003, Containerization International Yearbook - 2003 and port-provided data bases/interviews
2003 Potential US Port Productivity
Top 10 Ports in TEU Throughput

Source: Computed from Seaports of the Americas – 2003, Containerization International Yearbook - 2003 and port-provided data bases/interviews
Can US Marine Terminals Handle the Forecasted Freight Volumes ?...
75% of the 16 Ports Studied will have Significant Capacity Problems by 2010
Port Authority NY/NJ Long Range Regional Container Forecast (TEUs)

- **Low (40' Channels)**
- **Base (45' Channels)**
- **High (50' Channels)**

**Planning Year**
- 1995
- 2000
- 2010
- 2020
- 2030
- 2040

**Current Capacity**

Source: PANY/NJ
Ports of Los Angeles and Long Beach Container and Intermodal 2020 Forecast

1996 - 2000 = 4.8% CAGR
2000 - 2020 = 6.2% CAGR

“Cargo will quadruple, a 320% change”

57% Imports

Container

Intermodal Rail

5% Intermodal Split

2X

Current Capacity

(Worse Case: Asian Crisis Steady-State)
San Pedro Bay Ports of Los Angeles and Long Beach

Container Growth Implications:

“At current growth and per acre productivity, in 18 years the two Ports will require 3,624 new acres of container terminal”*

* Source: Port of Long Beach
Container Vessel Evolution & Trends
World Container Ship Evolution

**1st Generation** (Pre-1960 - 1970)
- 1,700 TEU

- 2,305 TEU

**3rd Generation** (1985)
- 3,220 TEU

**4th Generation** (1986 - 2000)
- 4,848 TEU

**5th Generation** (2000 - 2005)
- 7,598 TEU
Today’s Mega Ships - Measuring Up

- **Reginia Maersk** – 1043 Ft, 140 Ft wide, 6000+ TEUs
- **Eiffel Tower** – 990 feet
Madison Maersk (3,928 TEUs) in the Panama Canal
2003 New Build Orders

Expansion of World Post-Panamax Container Fleet

- 5,000+ TEUs
- 4,000 – 4,999 TEUs
- 3,000 – 3,999 TEUs
- 2,000 – 2,999 TEUs
- 1,000 – 1,999 TEUs
- <1,000 TEUs

63% “Mega Ships”

Source: 2004 Containerisation International Yearbook
AP Moller Odense Shipyard
Ultra Post Panamax Vessels

KNUD MAERSK In the Suez
(Regina Class: 6,000 TEU)
(Sovereign (S) Class: 6,600 TEUs)

Total S Class Fleet = 31 vessels (Delivery 2004)
Could the last vessels be super-sized to 10,500 TEUs ??
Mega Container Vessel Trends


The Reality:

- Regina Maersk: 6,000 TEU
- Sovereign Maersk: 6,600 TEU
- 20-Wide Planned: 8,000 TEU

Near Term Possible: 10,000 – 15,000 TEU (Suez-Class)
January 7, 2004...
Hapag-Lloyd’s new class of 8,600-TEU containerships by Hyundai Heavy Industries. Three 8,600-TEU "mega container ships," with the first to be delivered in 2007 and the remaining two in 2008. The 100,000 dwt ships will be 335 meters (1,099 feet) long, 43 meters (141 feet) wide, and a maximum speed of 25.2 knots.
The 15,000 TEU Containership

“...the ship is a flight of fancy... but such a ship is within the current state of the shipbuilder’s art...”

R. G. McLellan, P&O Containers
The 15,000 TEU Containership

LOA. = 400 m (1,312 ft.)
Draft = 14 m (46 ft.)
BEAM = 69 m (226 ft.)

Panamax Dimensions
28 Wide
13 Wide

Panamax Dimensions
Container Ship-in-a-Slip Concept
The 18,000 TEU Malaccamax
Reported Predictions/Benefits

• By 2010 on Asia-Europe Trade Route
• 30% Cheaper than 4800 TEU Panamax Vessel, primarily due to “Economies of Scale”
• US$40/TEU Savings

Source: Dynamar Consultancy, Rotterdam
USDOD Agile Port
Information Technology (IT) Developments
The Agile Port Concept is not a new technology...

...It is a way of managing and organizing information to reduce container port terminal dwell time & increase terminal capacity.
Agile Port Concepts
Integrating Vessel and Rail Information Systems
IT Data/Information Integration

Consist Data

Container Vessel

Consist Data

Data/Info Management

Double Stacked Train

Major Terminal & Systems Benefits
USDOD Agile Port Technology
Full Scale IT Demonstration Project

Hyundai Terminal
Washington United Terminals
Port of Tacoma
July 2003

Potential: Doubling the Terminal Capacity without Building Anything
46th Annual Research & Policy Forum

Panel Session:
Shifting Patterns of Global Trade

The Outlook for the Suez Canal Route – Asian Tsumami

Thank You