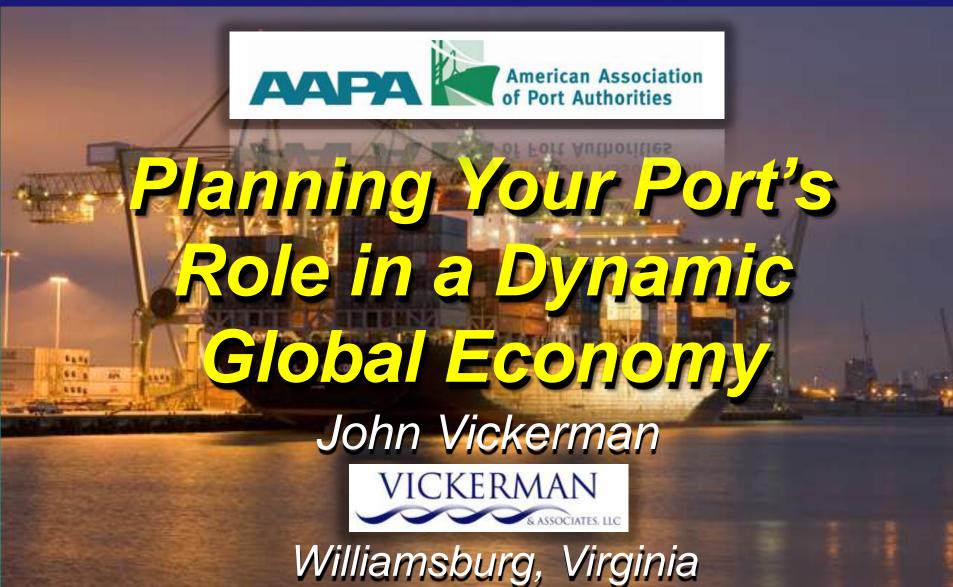
### 2011 AAPA Commissioners Seminar

Port Governing Board Members & Port Commissioners
Beau Rivage Resort, Biloxi, MS
May 17, 2011





# Functional Classification of Global Maritime Cargoes



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### American Association of Port Authorities

# International Port External Industry Pressures Driving Today's Logistics



# More than <u>98%</u> of everything we consume, wear, eat, drive and construct is brought to us via ships through the North American port system.







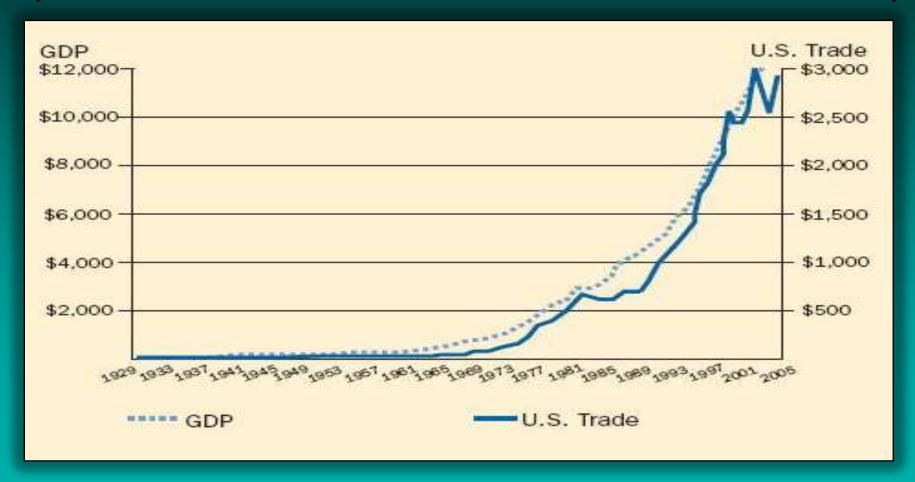
### Our Quality of Life is Directly Related to Our Participation in Global Trade & Transportation





# Relationship Between US Trade and US Prosperity – 1930 to 2005

(US Trade & Gross Domestic Product - \$ Billions)



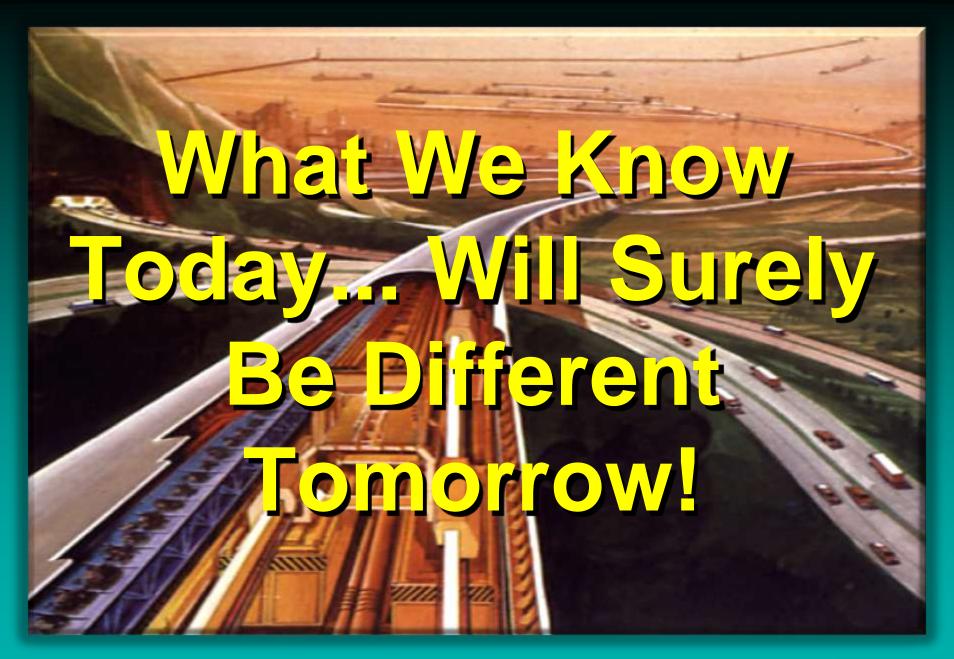






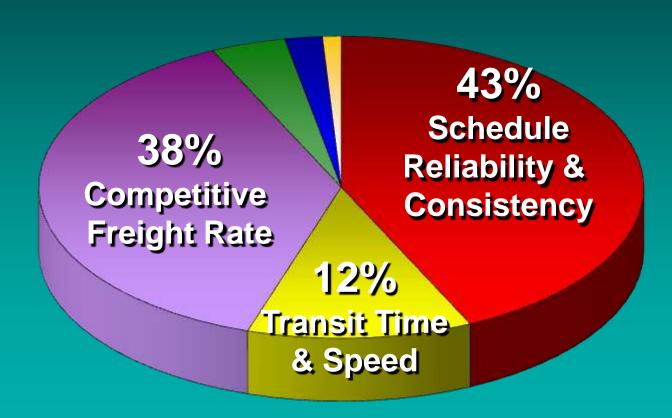


# **US Navy Fast Frigate Circa 2045**





# Poll of the Top 1000 "Blue Chip" Multinational Shipper Priorities





# Today's Logistics Truth: "The customer wants more and is willing to pay less for it."





### American Association of Port Authorities

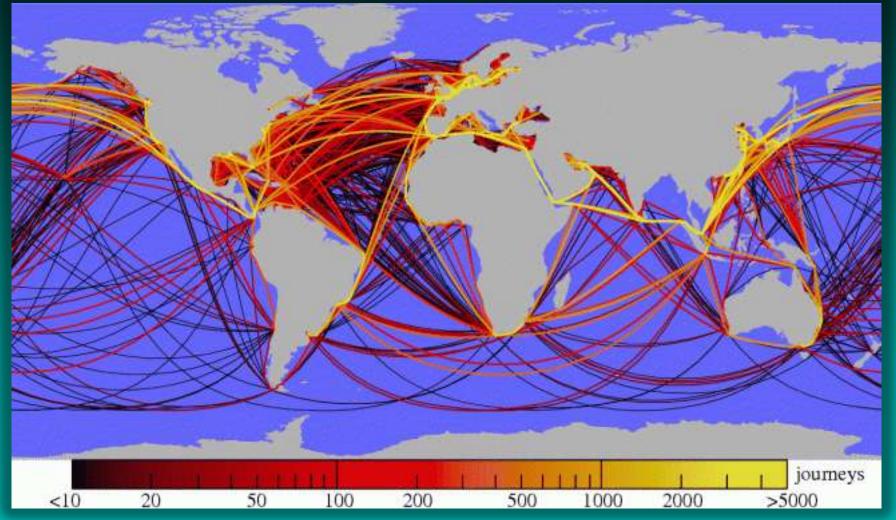
# Today's Trade Logistics Driving World Change



### Global Shipping Routes Plotted by AIS GPS

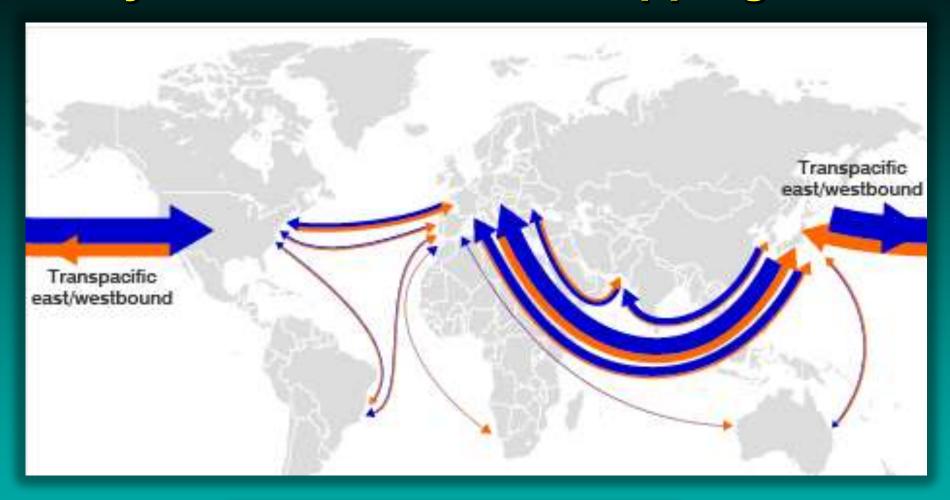
2010 Busiest Routes:

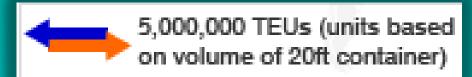
(1) Panama Canal, (2) Suez Canal, (3) Shanghai Port





### Today's Main Container Shipping Routes







### Shorter – Faster Arctic Ocean Route

2+ Months A Year Using Convoys



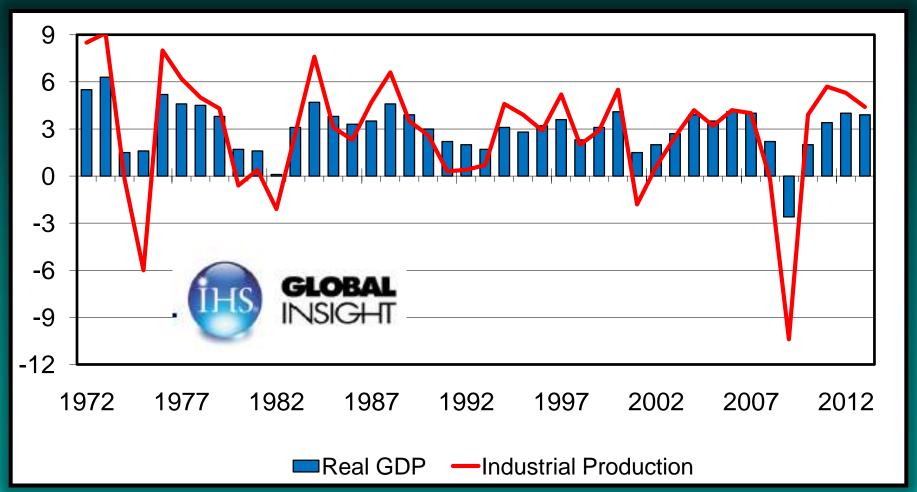






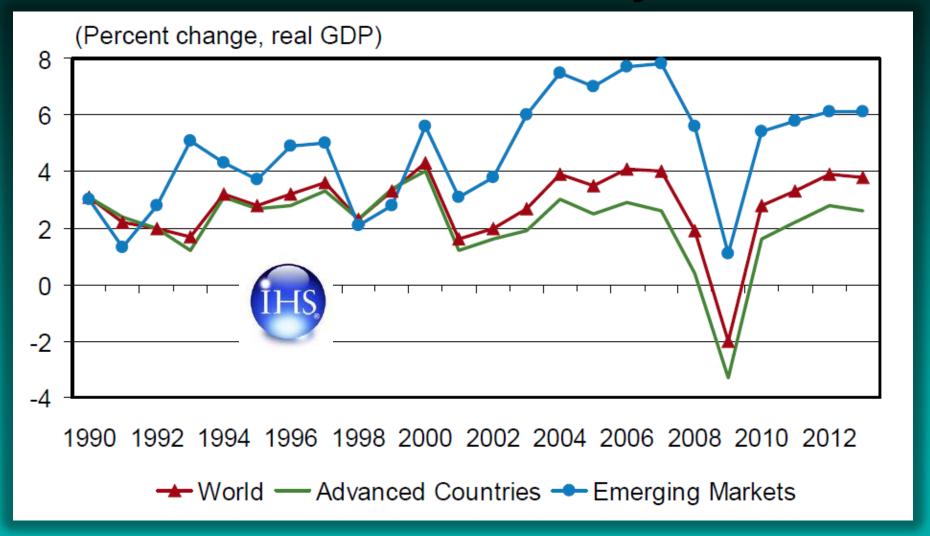
## The World Economy Has Suffered the Worst Recession of the Postwar Era

(Percent Change)





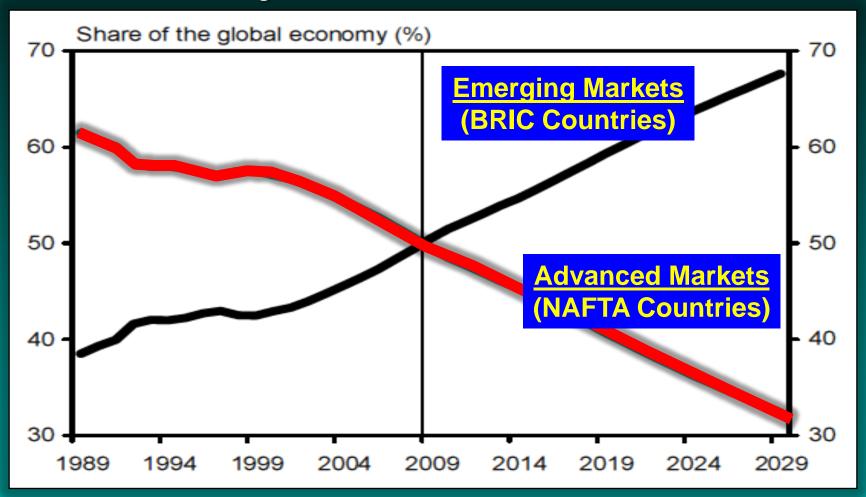
# **Emerging Markets Lead the Global Recovery**



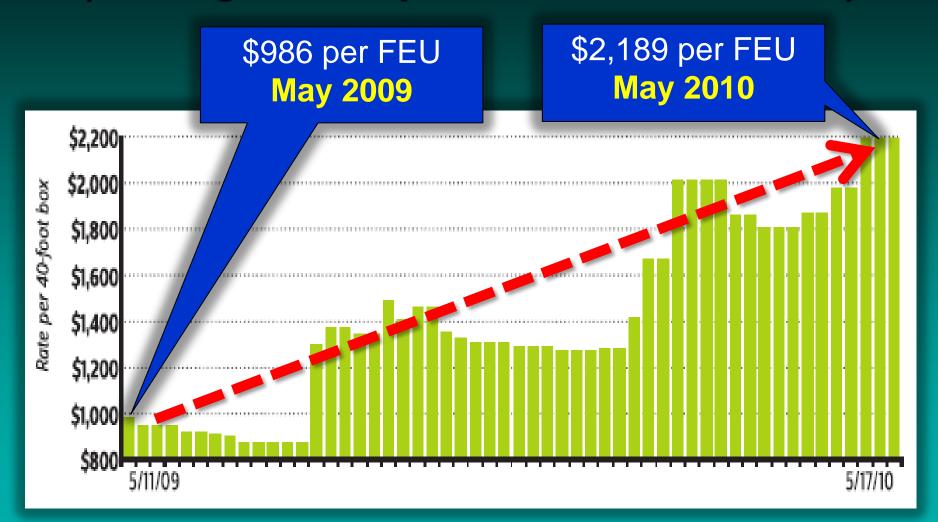


### A Turning Point in Global Economic History

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...



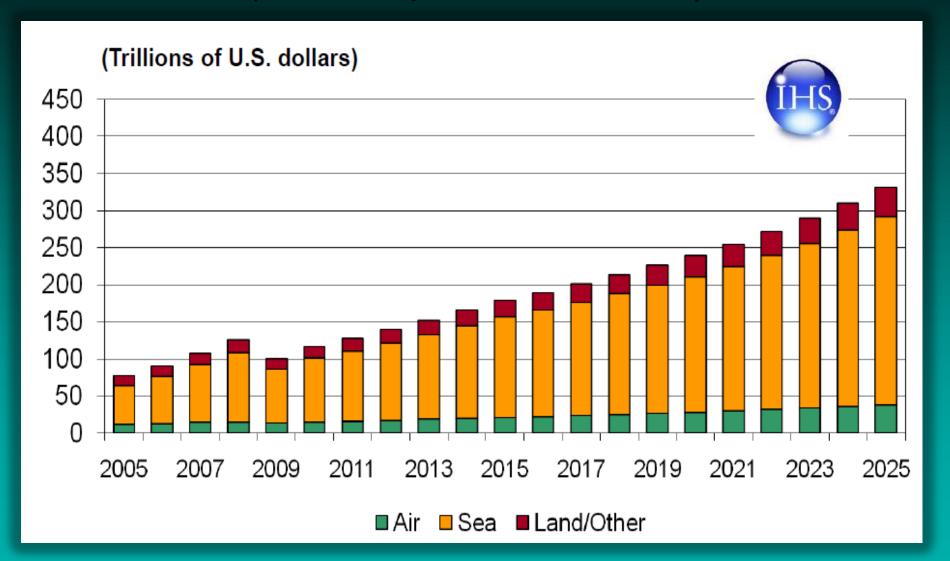
# 2009 - 2010 Container Rate Benchmark (Average FEU Spot Rate in US Dollars)





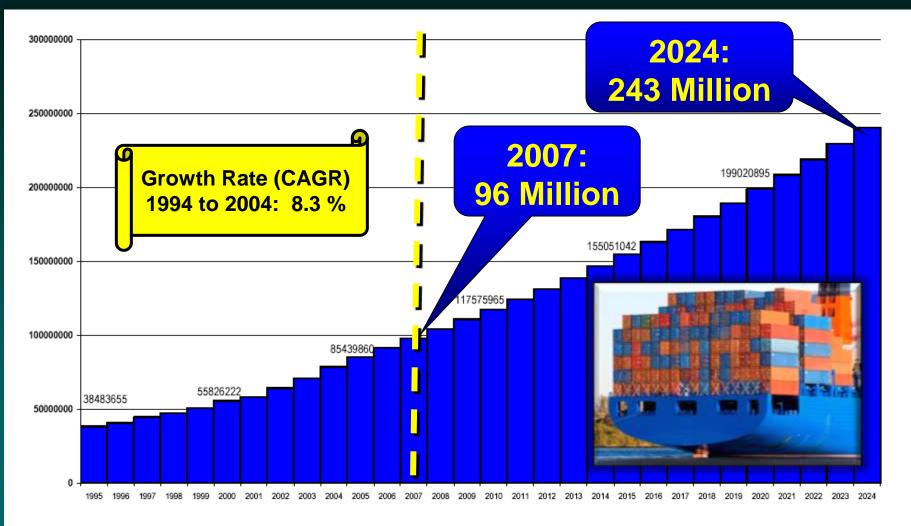
### **Growth in Global Merchandise Trade**

(Intra Europe Trade Excluded)

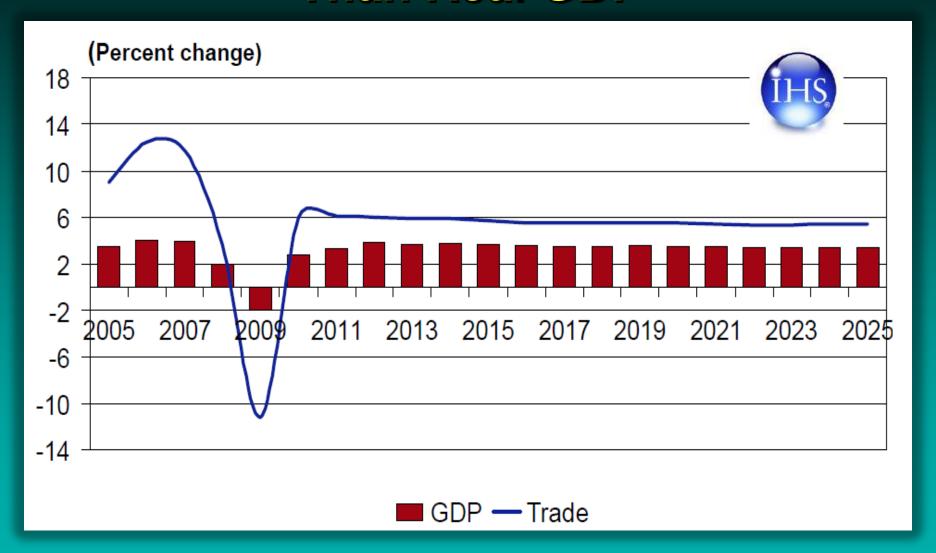




### World Container Forecast to 2024 in TEUs (186% Increase in Next 20 Years)

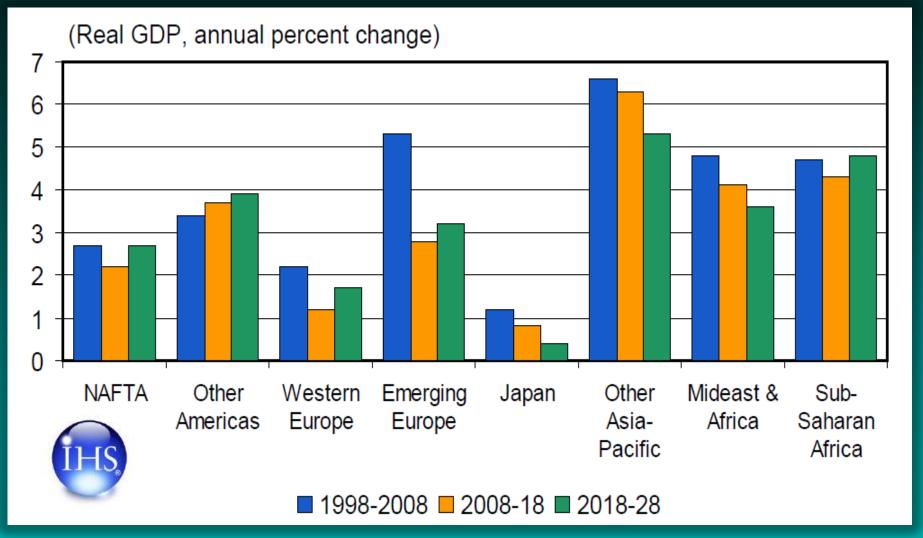


# World Trade Typically Grows Faster Than Real GDP





# Long Term World Economic Growth by Region





### The World's Top 20 Ports Posted a 15.1% Volume Growth in 2010 (2009 Rank in Brackets)

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

**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** 



**Chinese Ports** 



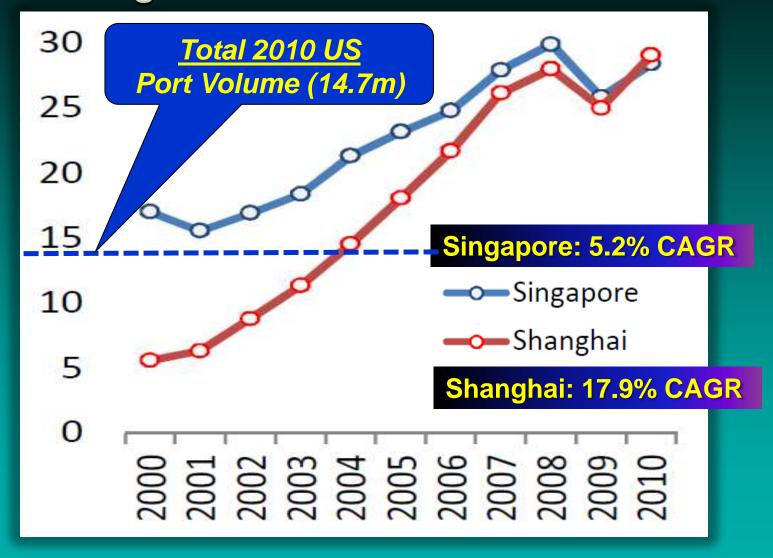
Source: Alphaliner Newsletter Volume 2011 Issue 5

### **China Breaks Container World Record**

Of the 10 busiest ports in the world in 2010, Nine are in Asia; of the top 10, Six are on the Chinese mainland

Chinese Ports hit an all-time monthly high of 12.44 Million TEUs in May 2010 with Six of the Top 10 Chinese Ports reporting Record Volumes.

### Singapore vs. Shanghai Container Volumes 2000 through 2010 Volumes in Millions of TEUs



### 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)









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# ne Astounding Ocean Marine Carrier Industry Comeback

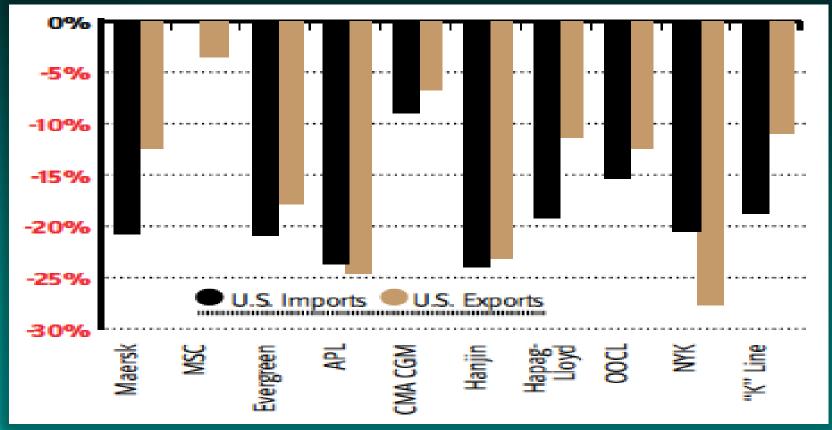






### In 2009 the Ocean Carriers Lost \$10 Billion Every Six Months

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:** Container Carriers Most Profitable Performance in History - \$14B in Profit

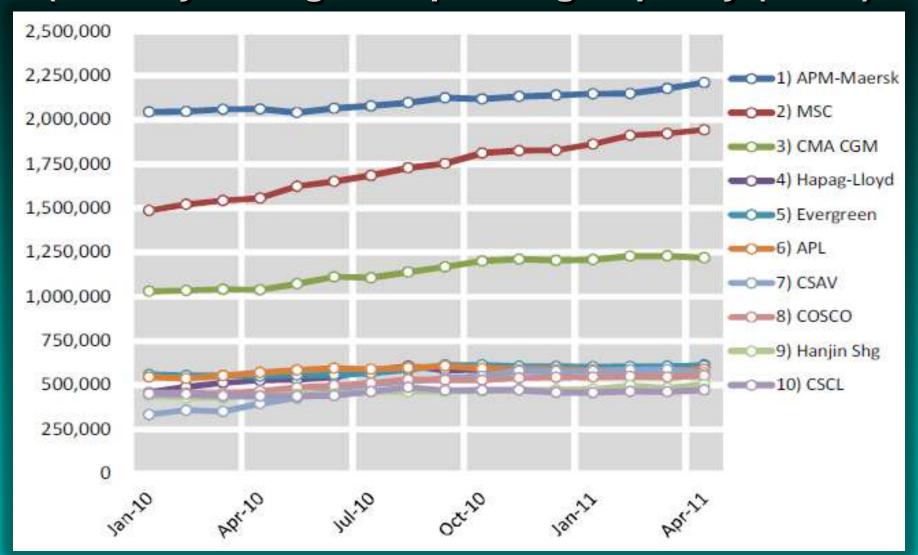


2010: Total Revenues Rising 42%; Total Container Handlings Increased by 14%; Freight Rates Increased 26%

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Source: Alphaliner Newsletter Volume 2011 Issue 16

### **2011 Top Containership Carriers**(Monthly Change in Operating Capacity (TEUs)





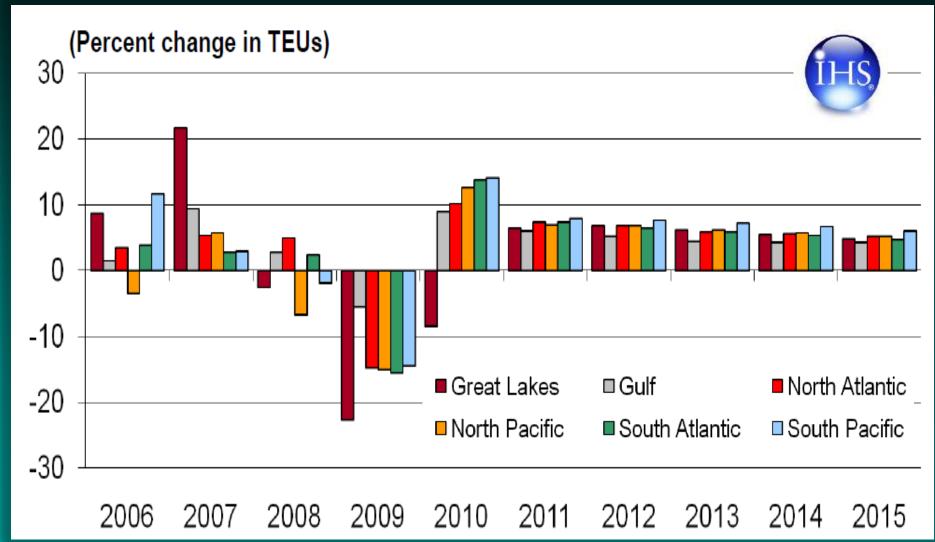


### American Association of Port Authorities

### North American Cargo Demand Trends (Dé jà vu Experience)

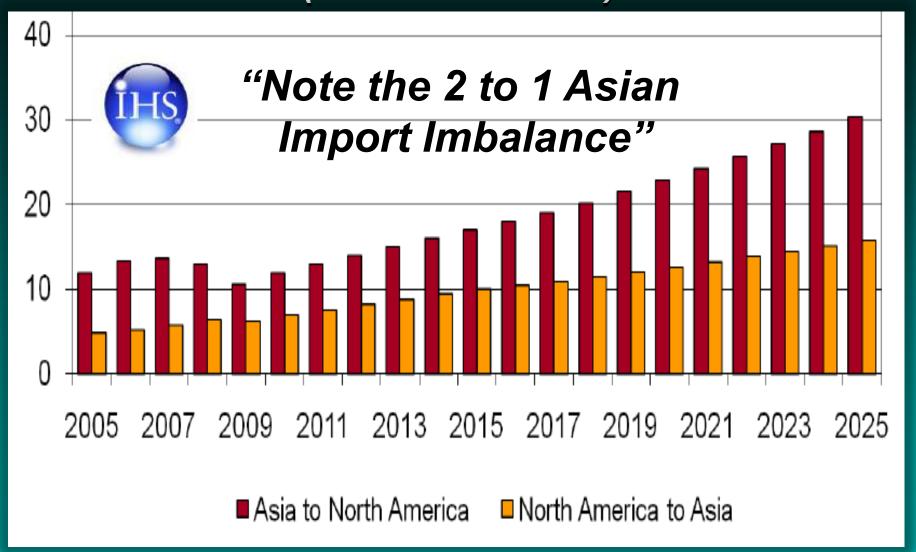


# Container Growth Rates by North American Coast

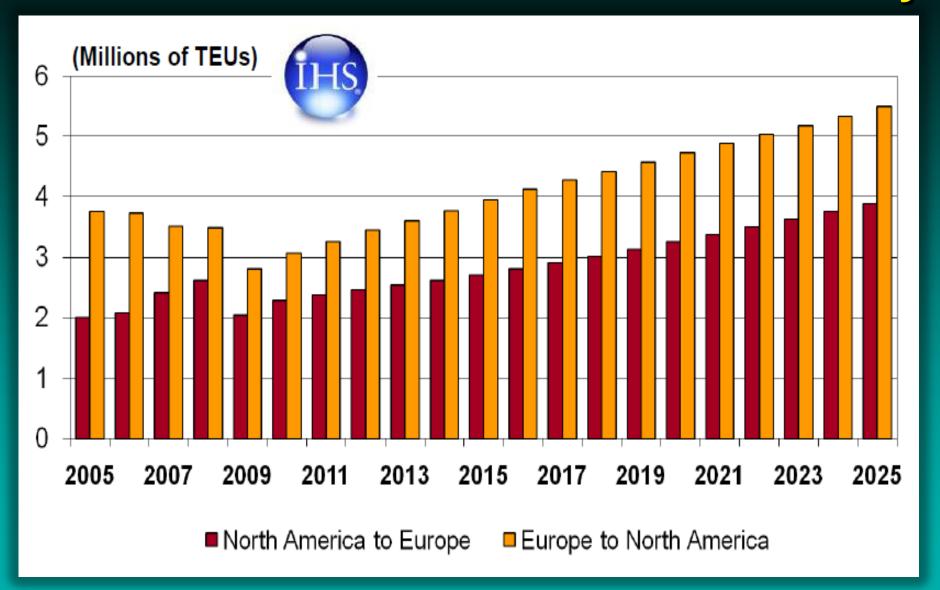




# Transpacific Container Trade Recovery (Millions of TEUs)



#### Transatlantic Container Trade Recovery

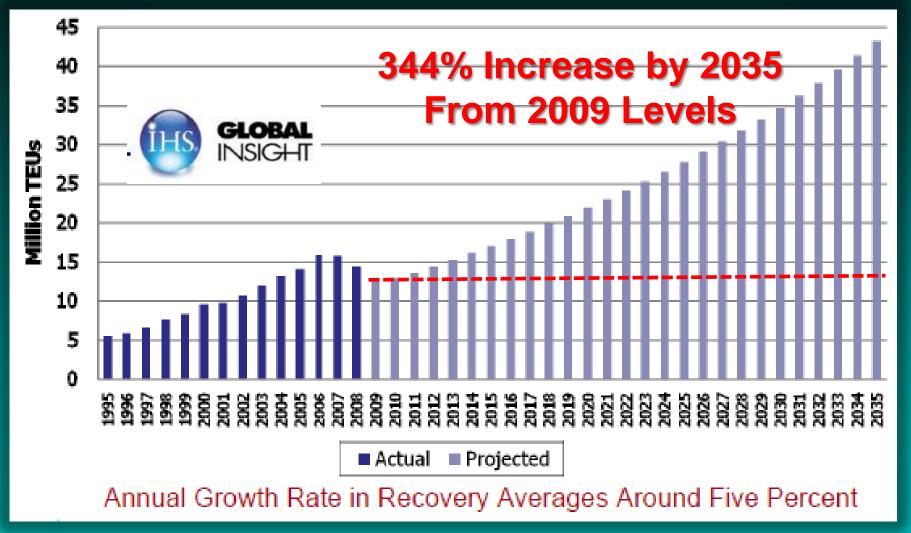






## San Pedro Bay (POLA +POLB) Container Volume Forecast





#### North American Emerging Mega-Regions

Future US Growth Areas







U.S. Intermodal Rail Flow

Expanded Asian Panama Canal 2014 Flows Western Centroid Sh

**Eastbound:** All Water Flow

Eastbound: US Intermodal Rail Flow



### Southeast Asian Manufacturing Centroid Shift



With Manufacturing Centroid Shifts Into Vietnam and/or India, The North American East Coast will **See Dramatically More Westbound Suez Traffic** 



Copyright @ 2010

# Hong Kong - New York: Panama vs. Suez Canal Transit Times & Distances



In Nautical Miles at 22 Knots

Approx. \$425,000 Per Transit (8,000 TEUs)



Source: Dataloy Distance Tables



#### **Suez Canal Container Vessel Convoy Traffic**

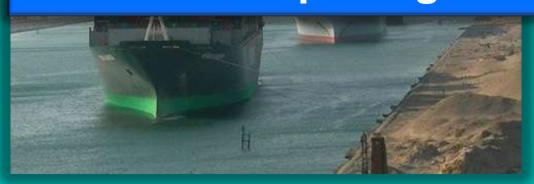
(Ships Currently Transit the Suez Canal in 3 Daily Convoys)





#### 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.





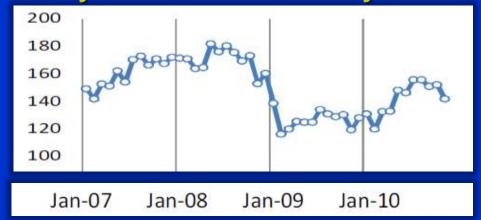
# Khamsah Abū Sultān Jabal 'Uwaubid Navigation 30000

#### **Suez Canal Operations**



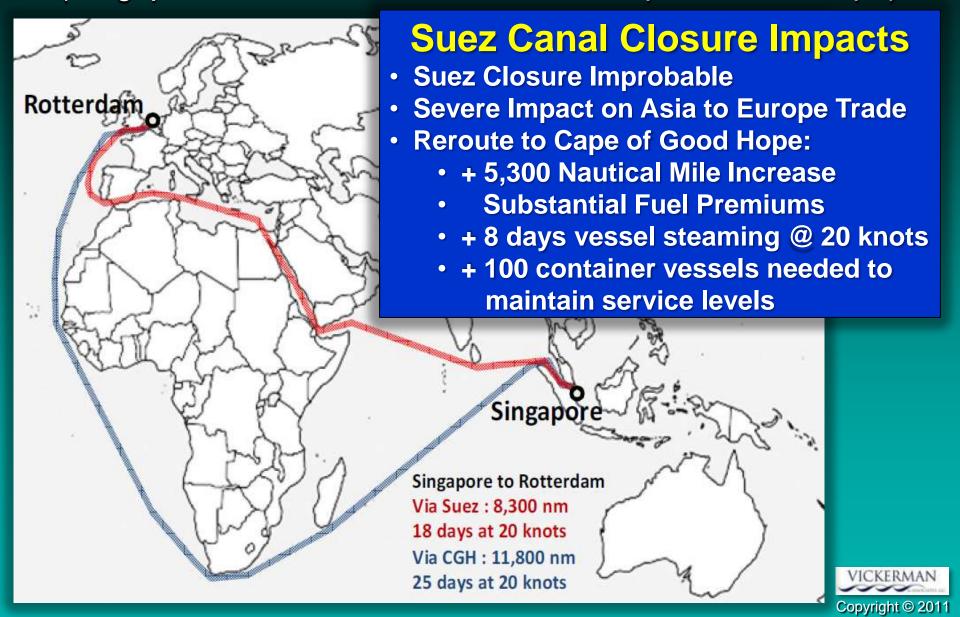
#### **Suez Canal Operations:**

- Suez Canal Closed Twice Before:
  - 1956 1957 (6 months)
  - 1967 1975 "Six Day Arab-Israeli War"
- Heavy military presence along the Canal
- UN Peacekeeping force at the Suez
   Canal is reported to be 90 % U.S. Military
- Weekly Vessel Transit History:



#### **Suez Canal Closure Implications:**

(Singapore to Rotterdam Via Suez vs. Cape of Good Hope)





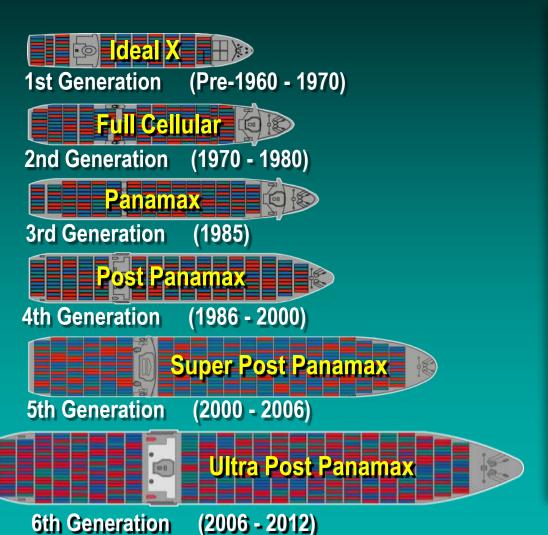
American Association of Port Authorities

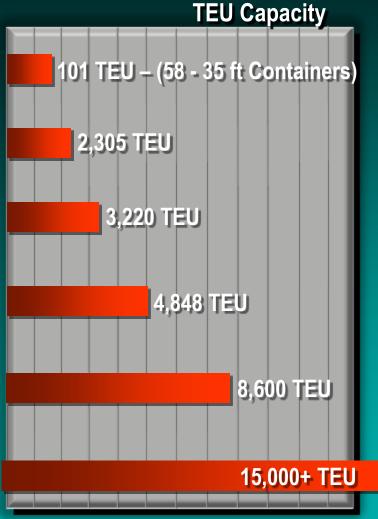
# Maritime Vessel Technology Trends





#### **World Container Ship Evolution**







# Madison Maersk (3,928 TEUs) in the Panama Canal

(Current Max Panamax Vessel Approx. 4,800 TEUs)







#### A.P. Moller-Maersk L Class M/S Emma Maersk

(15,000 TEU Vessel - 22 Containers Wide)





Length: 1,302 ft, Width: 207 ft, Net Cargo: 123,200 tons

Quay Cranes: 10, Engine: 14 in-line cylinders diesel engine (110,000 BHP)

Cruise Speed: 31 mi/h, Full Crew: 13, Construction cost - US \$145 M+

Source: Maritime World Logistics Inc...



#### 2010: Evergreen Orders 100 New Containerships, delivery 2010-2012



32 vessels of a new type with a capacity of 8,000 TEUs each 20 additional S-type (7,024-TEU) ships 20 additional U-type (5,364-TEU) ships 20+ 2,000-TEU feeder ships of a new type

Source: JOC April, 9 2010



# MSC Daniela 15,000+ TEUs World's Largest Container Ship

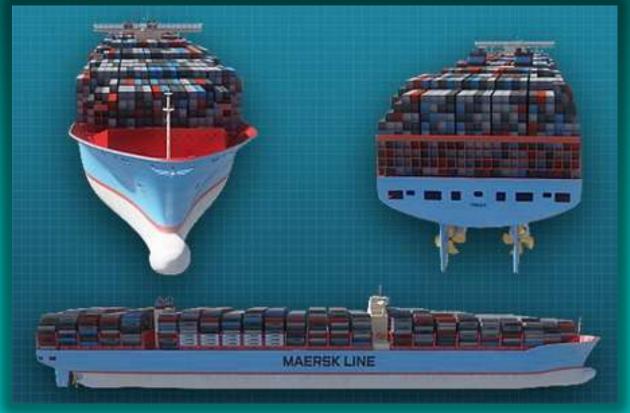
Built by Samsung Shipbuilding & Heavy industries Co. Ltd in South Korea and delivered to Mediterranean Shipping Company in December 2009. She is the largest container ship ever built.





#### February 2011: A.P. Moller-Maersk Orders 30 – 18,000 TEU Container Vessels "Largest in the World"

Daewoo Shipbuilding & Marine Engineering has won a US\$2 billion order from A P Moeller-Maersk to build 10 vessels of 18,000 TEU capacity each. Daewoo is in talks with Maersk to build a further 20 ships of same capacity for a total order worth \$6 billion, Korean firm's biggest ever single order



Source: Cargonews Asia - e-Cargo news Asia February 18, 2011





#### February 2011: A.P. Moller-Maersk Orders 30 – 18,000 TEU Container Vessels "Largest in the World"









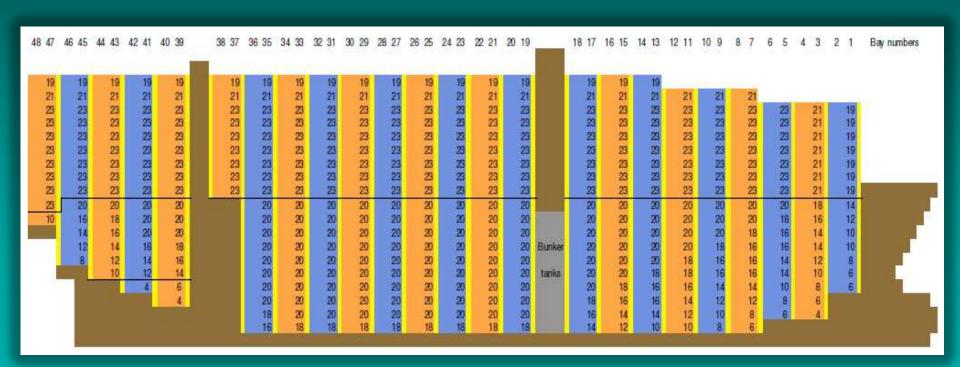
23 Containers Wide – 9 Tiers Above the Hatch





# Maersk Line EEE Class Capacity Analysis

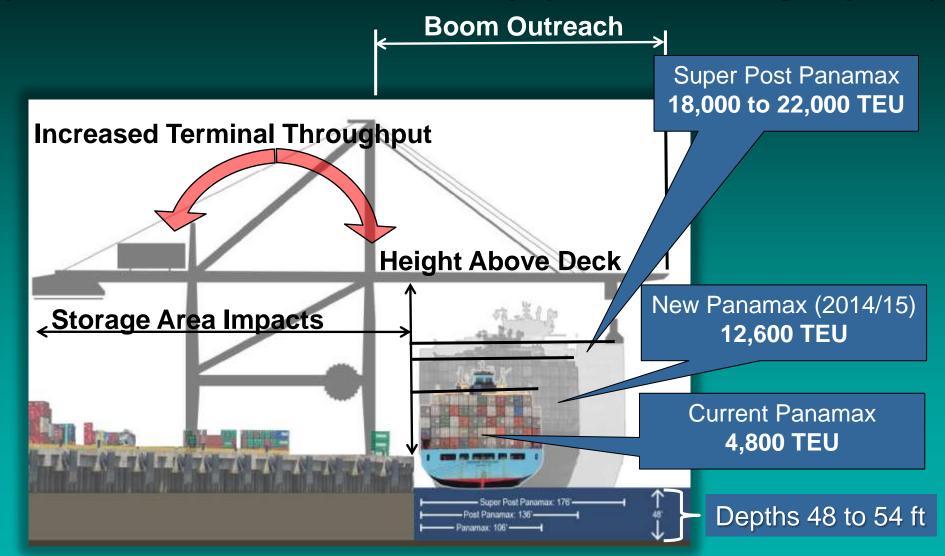
Total Capacity = 8,077 FEU Containers = 18,054 TEUs Capacity Above the Hatch = 4,639 FEU HC (9 High Tiers) Capacity Under the Deck: 3,438 FEU HC = 7,685 TEUs





#### **Vessel Size Expansion - Terminal Impacts**

(Port Terminal Infrastructure & Equipment Geometry Impacts)





# 21,000 TEU Ultra Large Twin Engine Container Ship - 2011







Source: Alphaliner Newsletter Volume 2011 Issue 4

#### **Future 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

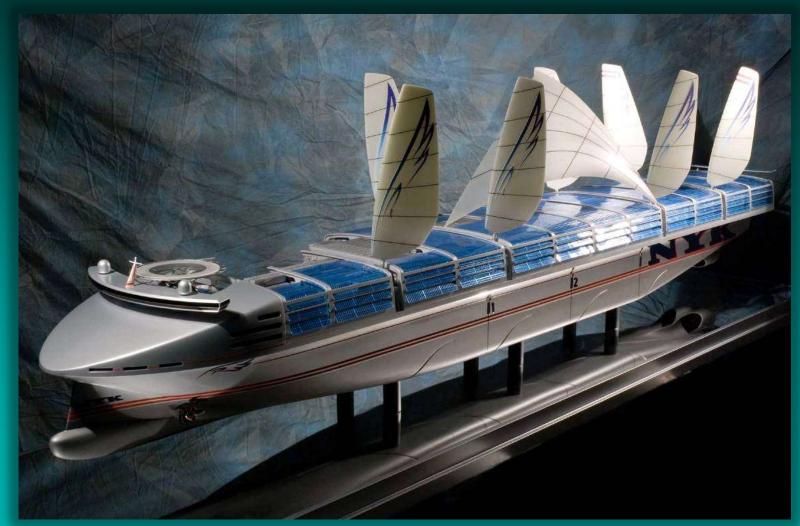
Deadweight Tonnage = 220,000 Long Tons

Draft = up to 54 ft

Far Exceeds the 2014/15 Panama Third Lane Capacity









### NYK LOGISTICS NYK Super Eco Ship



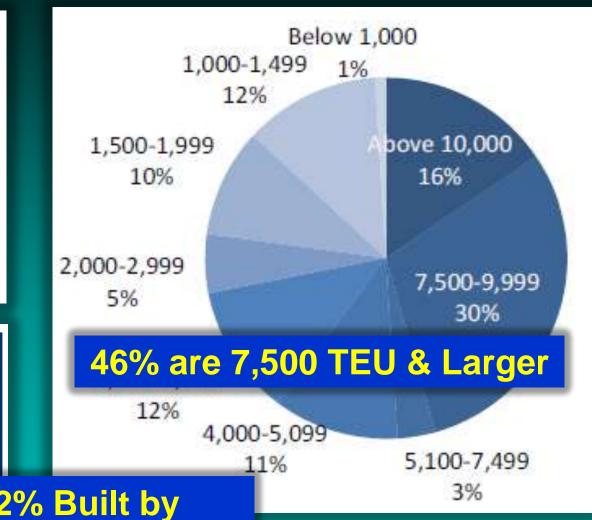
#### 2010 - 2011 New Containership Orders

(Size Range, Order Percentage, & Country of Built)

Size Range	Units Ordered
Above 10,000	32
7,500-9,999	62
5,100-7,499	7
4,000-5,099	23
3,000-3,999	24
2,000-2,999	11
1,500-1,999	20
1,000-1,499	25
Below 1,000	2

Country	Units	TEU
S Korea	127	1,038,123
China	62	269,338
Philippines	8	30,400
Taiwan	6	
Japan	2	92

Germany



S. Korea & China ner Newsletter

Volume 2011 Issue 17





American Association of Port Authorities

# Panama Canal Expansion: New Capacity



#### **The Panama Canal Circa 1914**





#### Panama Canal Expansion





More than 14,000 ships a year pass

# A \$5.25 Billion Investment in a 3<sup>rd</sup> Set of Locks Equating to 16% of Panama's National GDP



Pacific Ocean & Caribbean Sea carrying \$275 million tons of Cargo and \$100 billion in container shipping

Source: ACP Data



#### **FY 2009 Panama Canal Route Traffic**

(Millions of Long Tons)



1915 - 2010

Total Number of Transits: 1,000,972 Amount of Cargo: 8,587,711,605 LT

Source: ACP Data



## 2010 Weekly Panama Canal Through Transits vs. Non-Transit Feeder Services



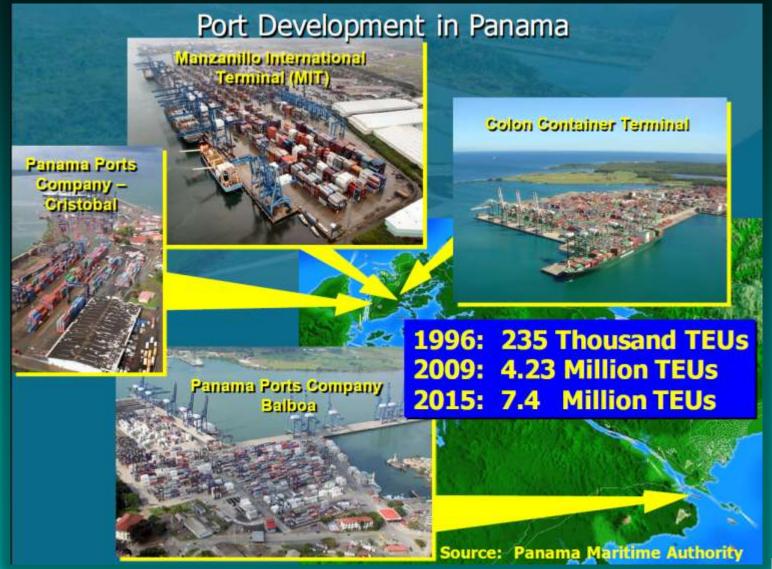


Weekly Through Transits
Feeder Services – No Transit

Source: ACP and Compare, 2008 Data



#### Panama Maritime Authority Becomes A Major Transhipment Center



# Non-Transit Panama Canal "Feeder Services" May Be the Real Boom from the Canal Expansion





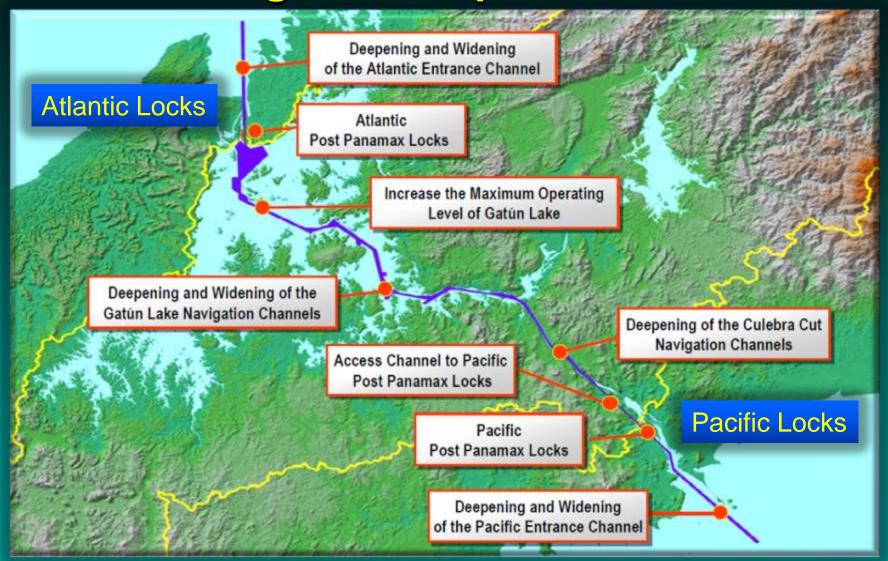
Weekly Through Transits
Feeder Services – No Transit

Source: ACP and Compare, 2008 Data





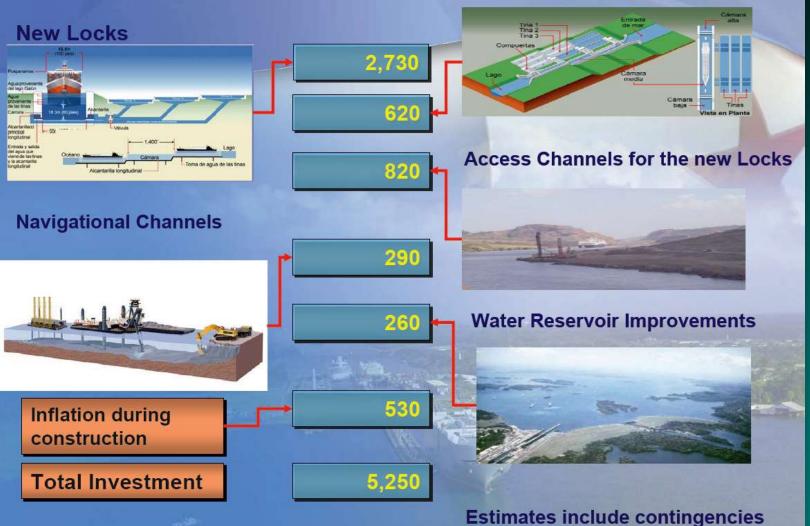
# Panama Canal Expansion Program Components



### Cost Estimates for the Project (in million U.S. dollars)



#### **Water Saving Basins**

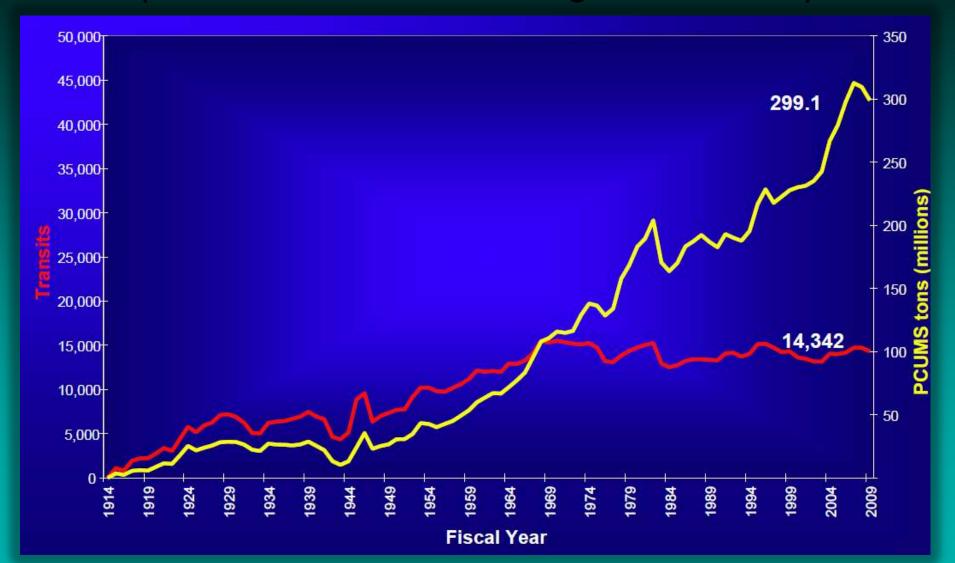


Source: ACP Financial Data



#### Panama Canal Transit & Tonnage Traffic

(Transits and PCUMS Tonnage 1914 to 2009)

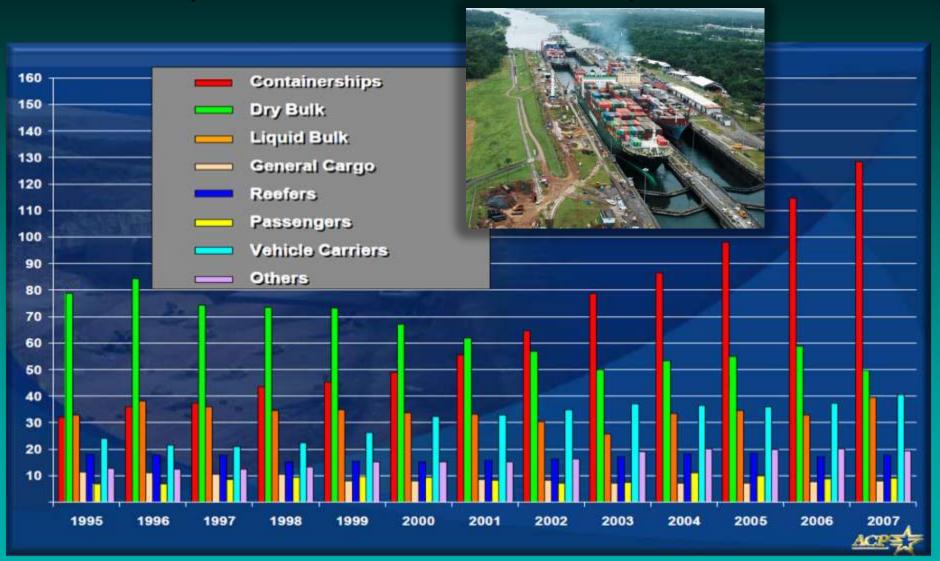


Source: ACP Data





### PC/UMS Vessel Type By Market Segment (In Millions – FY 1995 to 2007)



#### 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





# **2025 Summary of Canal's Financial Results** (To 2025 In Millions of Dollars – Annual Fees)



#### Summary of the Expanded Canal's Financial Results

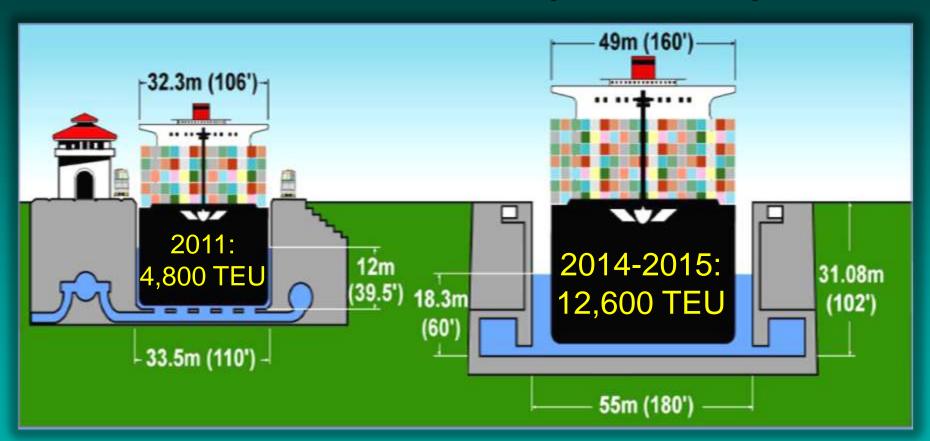
Financial Results <sup>1</sup>		Year 2005	Year 2025	Annual average growth rate
PCUMS Tons <sup>2</sup>		279	508	3.0%
Transit Revenue	546%	Increase	6,101	8.9%
Other Revenues		92	125	1.5%
Total Revenues		1,209	6,227	8.5%
Operating Costs		444	1,016	4.2%
Fee per Net Ton <sup>3</sup>		218	668	6.5%
Public Services Fees <sup>3</sup>		2	2	0.0%
Depreciation		61	231	6.8%
Net Income	890%	<b>Increas</b>	4,310	11.6%

Source: ACP Financial Data





#### Panama Canal Third Lane Expansion Capabilities



# 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

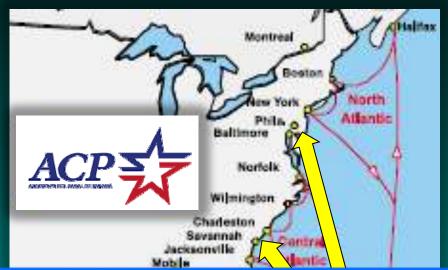




# The Container Ship Colombo Express (8750 TEU)



# 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!





#### Southeast Louisiana Asian Routing Comparison – Shanghai to New Orleans







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# Panama Canal **Expansion**: Current Construction Status

(January 2011)

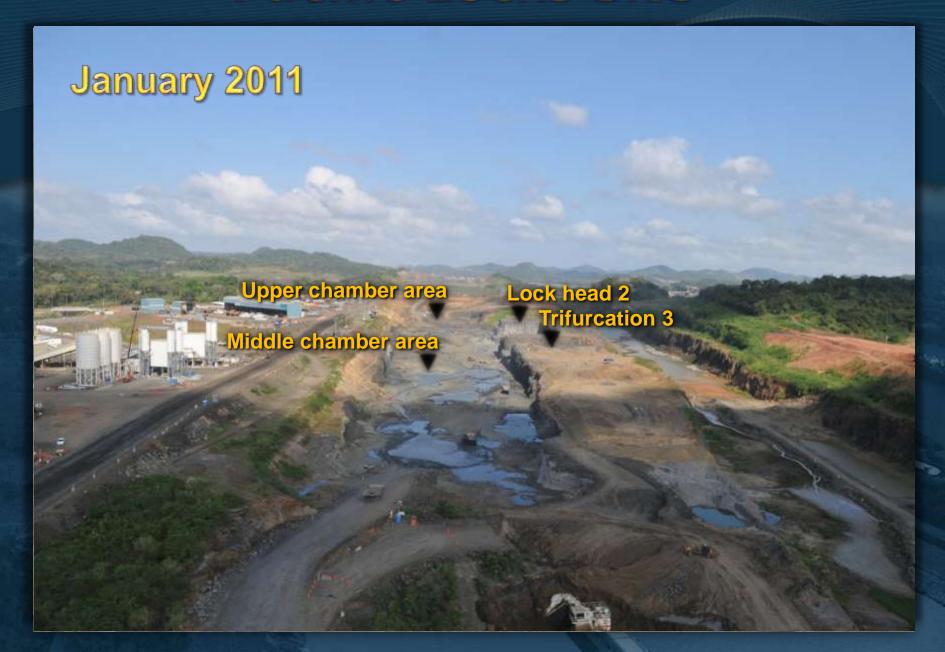


### Pacific Locks Site





#### **Pacific Locks Site**



#### **Pacific Locks Site Construction**



#### **Pacific Locks Site Construction**









#### **Pacific Locks Site - Finished**



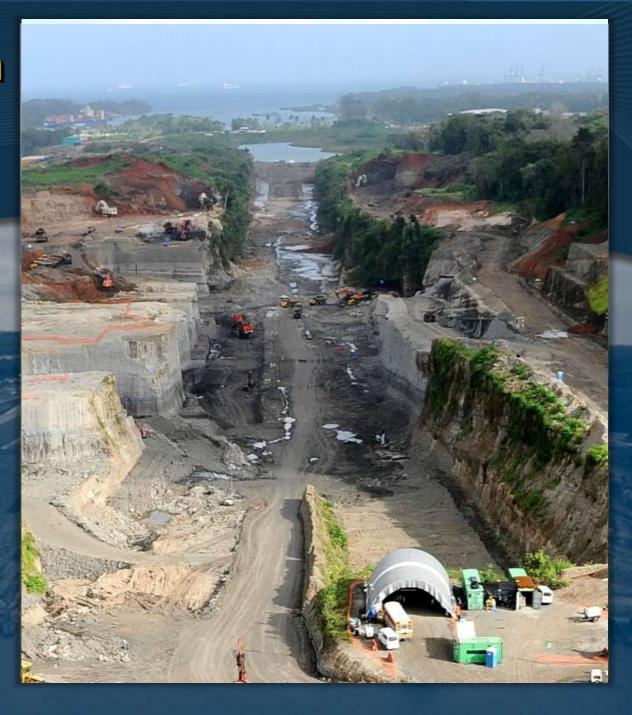


# Construction Progress

October 2009

**June 2010** 

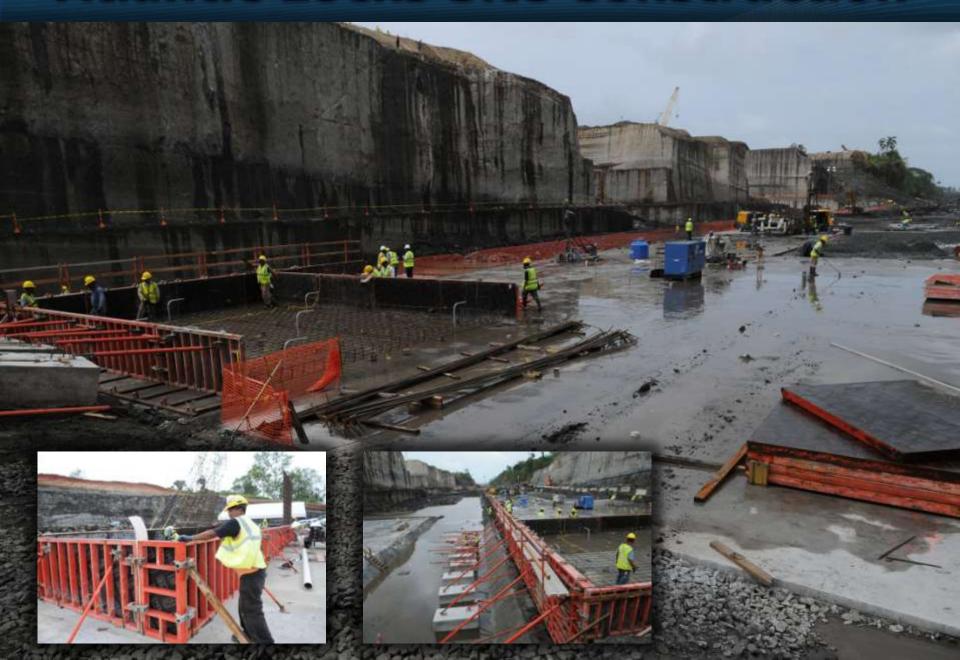
January 2011



#### **Atlantic Locks Site Construction**



#### **Atlantic Locks Site Construction**



#### **Atlantic Locks Site: Finshed**







# Panama Canal Expansion: Predictions & Impacts



# Scale Economies: Panama Canal Vessel Deployment US East Coast Market Reach

4,000 TEU - 51% US Market

8,000 TEU - 66% US Market







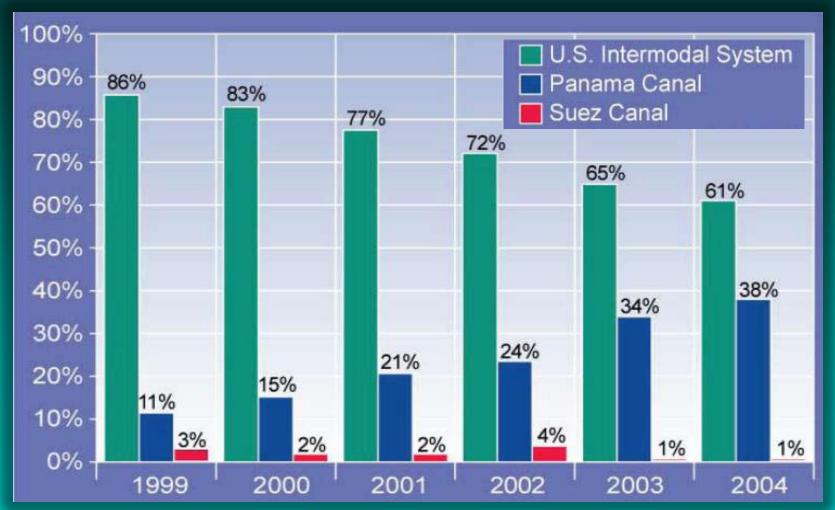
Assumptions: \$400/MT Bunker; 2011 ACP Canal Tolls; 2010 Ship Charter Rates; Inland Move by Rail

Copyright © 2011



### Panama Canal Gained Market Share in US Intermodal Transcontinental Container Trade

(1999 to 2004 - Asia to USEC)



Source: ACP Data Base, PIERS, AAR



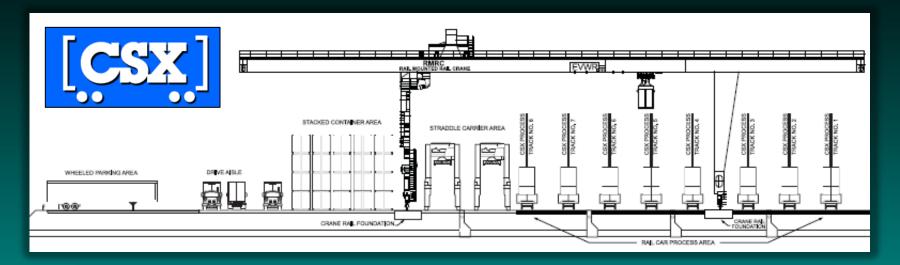
# The Primary North American Competitor to the Panama Canal is the Class I Rail Intermodal System

(Potential Increased Service Offerings and System Capacity)

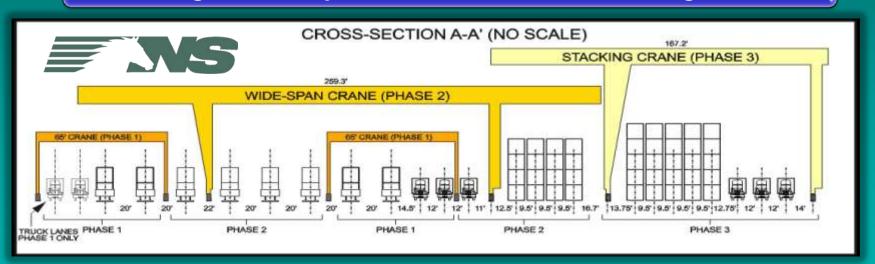




#### Emerging US Green Inland Port Technologies



#### CSX High Density Intermodal Crane Configuration



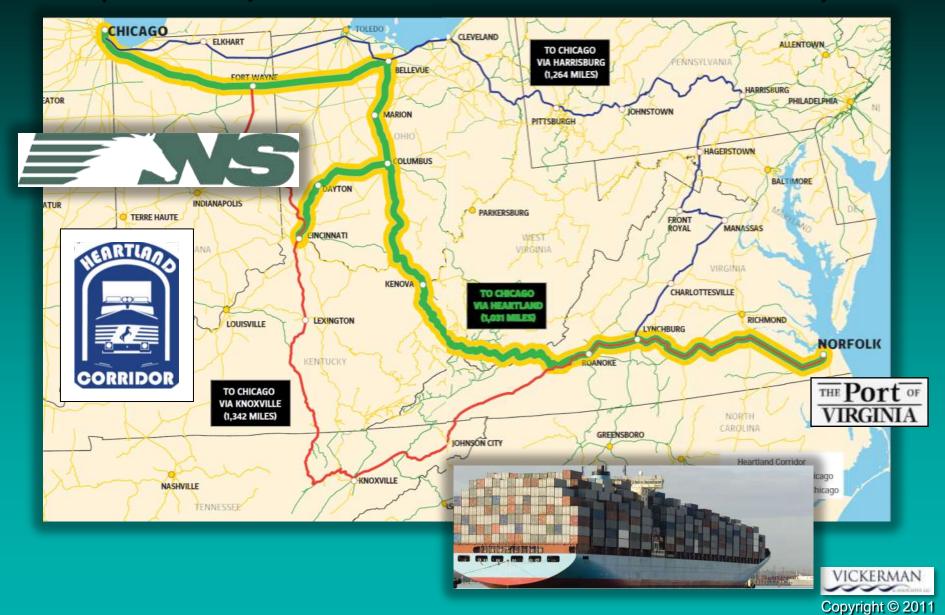
NS High Density Nested Crane Configuration





#### **Norfolk Sothern Heartland DST Corridor**

(Carrier Opinions on the corridor are undecided)



#### \$842 Million CSX National Gateway



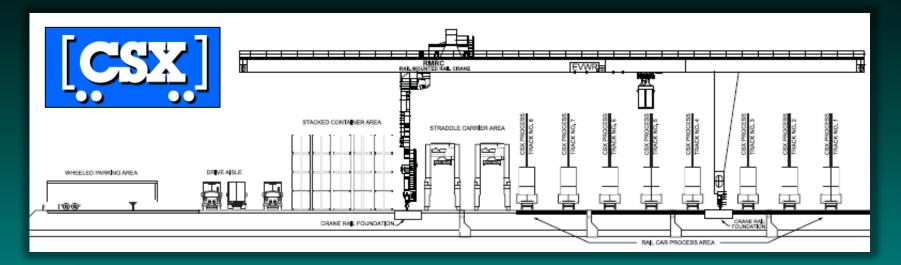


# **CSX Rail Mounted Gantry (RMG) Cranes North Baltimore Ohio Rail Logistics Hub**

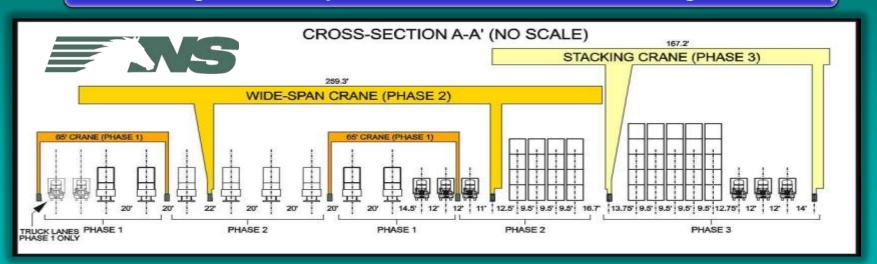




#### Emerging US Green Inland Port Technologies

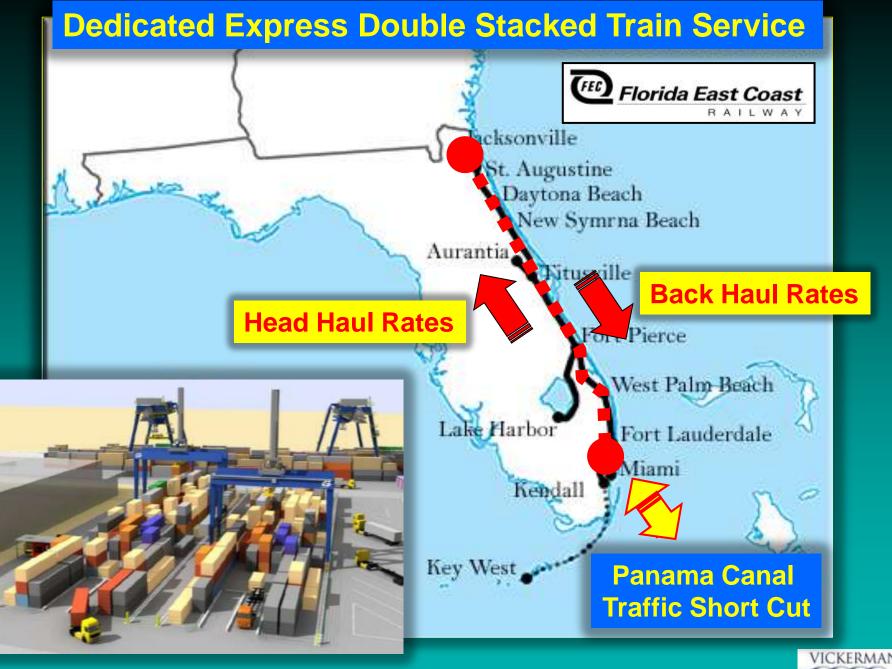


#### CSX High Density Intermodal Crane Configuration

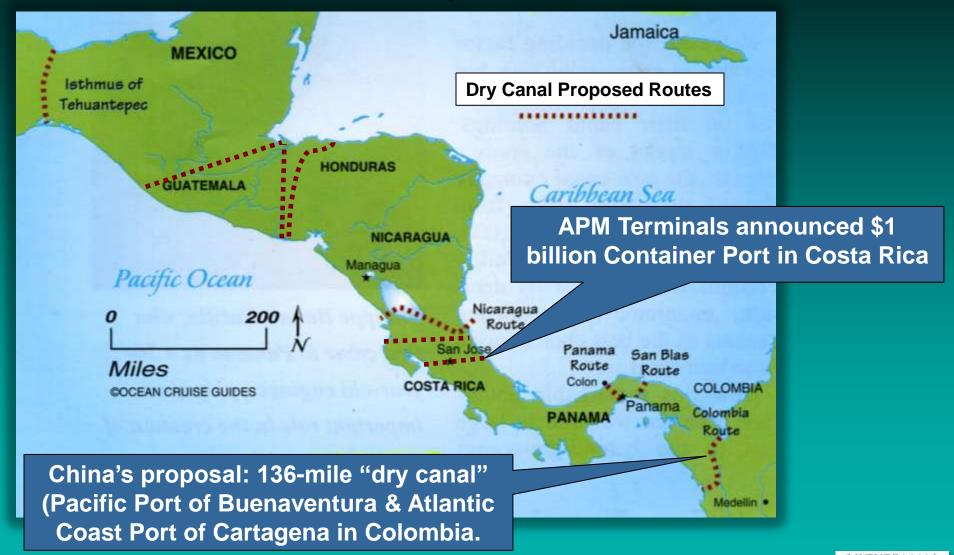


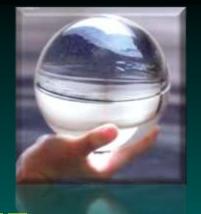
NS High Density Nested Crane Configuration





# Alternative "Dry Canal" Proposals to Counteract Anticipated Canal Fees/Costs





# 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:

✓ 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?

- ✓ 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!



#### American Association of Port Authorities

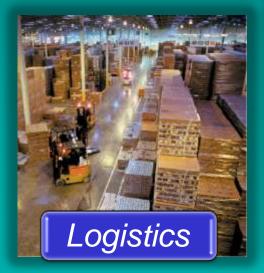
# Inland Ports: Defined - A Convergence of Logistic Trends



# Inland Ports Defined A Convergence of Logistics Trends















American Association of Port Authorities

# Inland Ports: Europe's Current Strategy Applications





# Rotterdam World Gateway- EUROGATE Builds an Inland Container Port Network

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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 <u>first time</u> 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 Alblasserdam €38 million, open by end-2012)



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# 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





#### 2011 AAPA Commissioners Seminar

Port Governing Board Members & Port Commissions
Beau Rivage Resort, Biloxi, MS

May 17, 2011

