2011 Facilities Engineering Seminar – New Orleans, LA

Panel I:
North American Economic Trade Outlook for the Port Industry

Presented By

M. John Vickerman

Principal

VICKERMAN & ASSOCIATES, LLC

Williamsburg, Virginia

BACK TO THE FUTURE

International Port External Industry Pressures Driving Today's Logistics

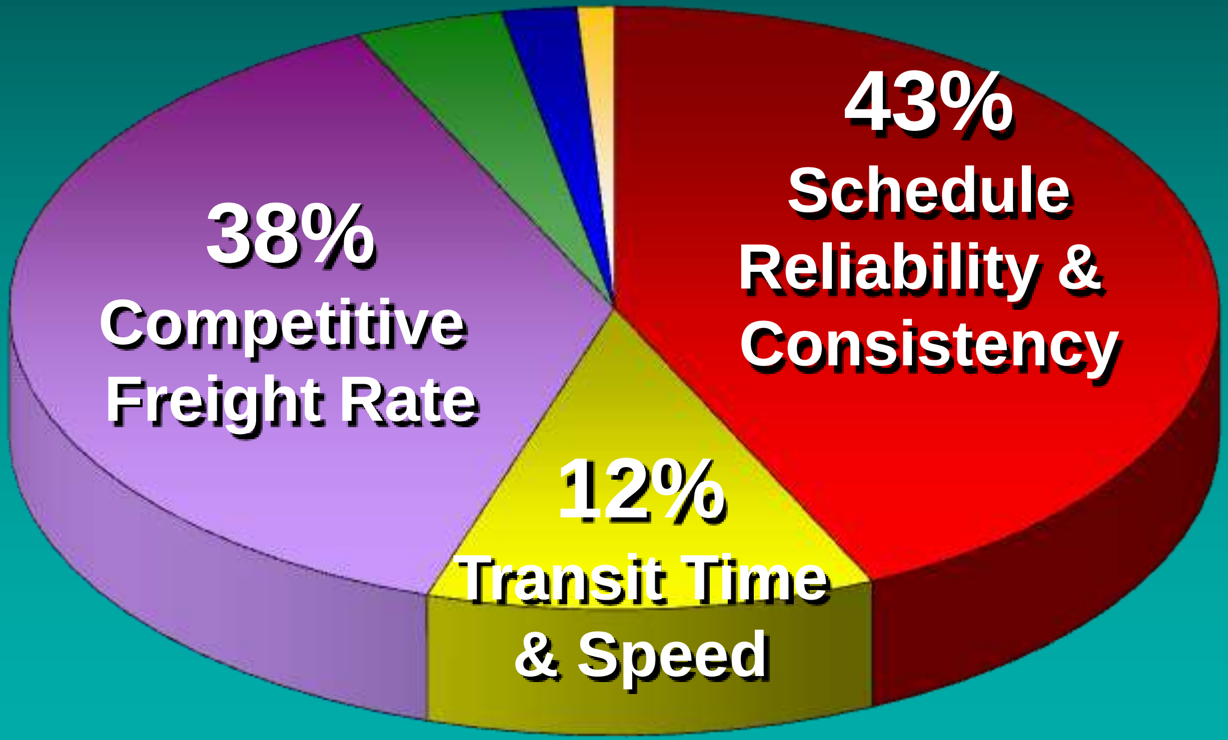
More than 98% of everything we consume, wear, eat, drive and construct is brought to us via ships through the North American port system.

VICKERMAN

To Be Competitive Today…

Marine/Intermodal Terminals Must <u>Reduce</u> Throughput <u>Cost</u> & <u>Increase</u> Cargo <u>Velocity</u> <u>Securely and as Stewards of the Environment</u>

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



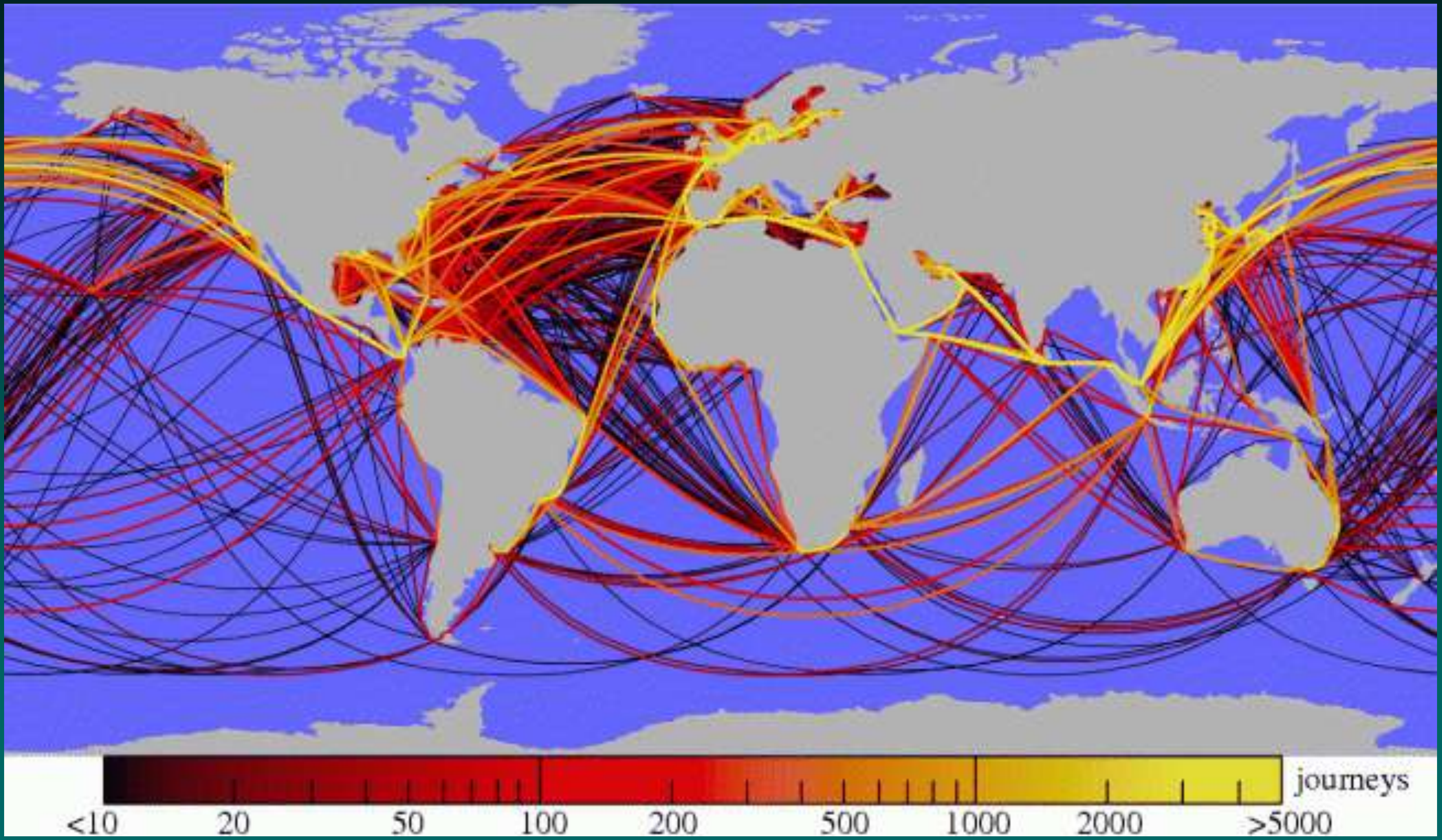
Today's Logistics Truth:

"The customer wants more and is willing to pay less for it."

International Maritime Cargo Demand Trends

Global Shipping Routes Plotted by AIS GPS

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

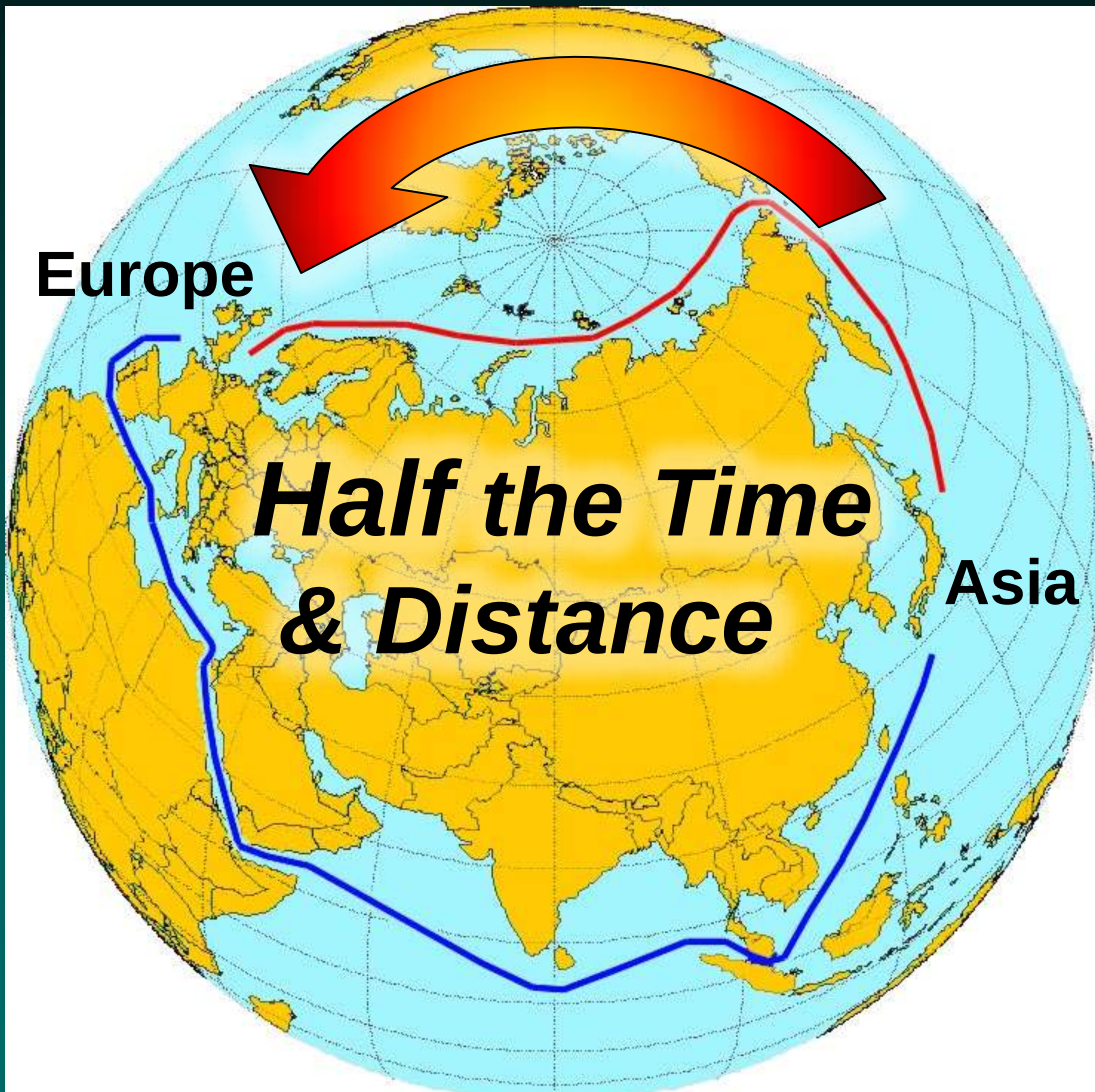


Source: Wired Science January 2010 Journal of the Royal Society: Interface

VICKERMAN

Shorter – Faster Arctic Ocean Route

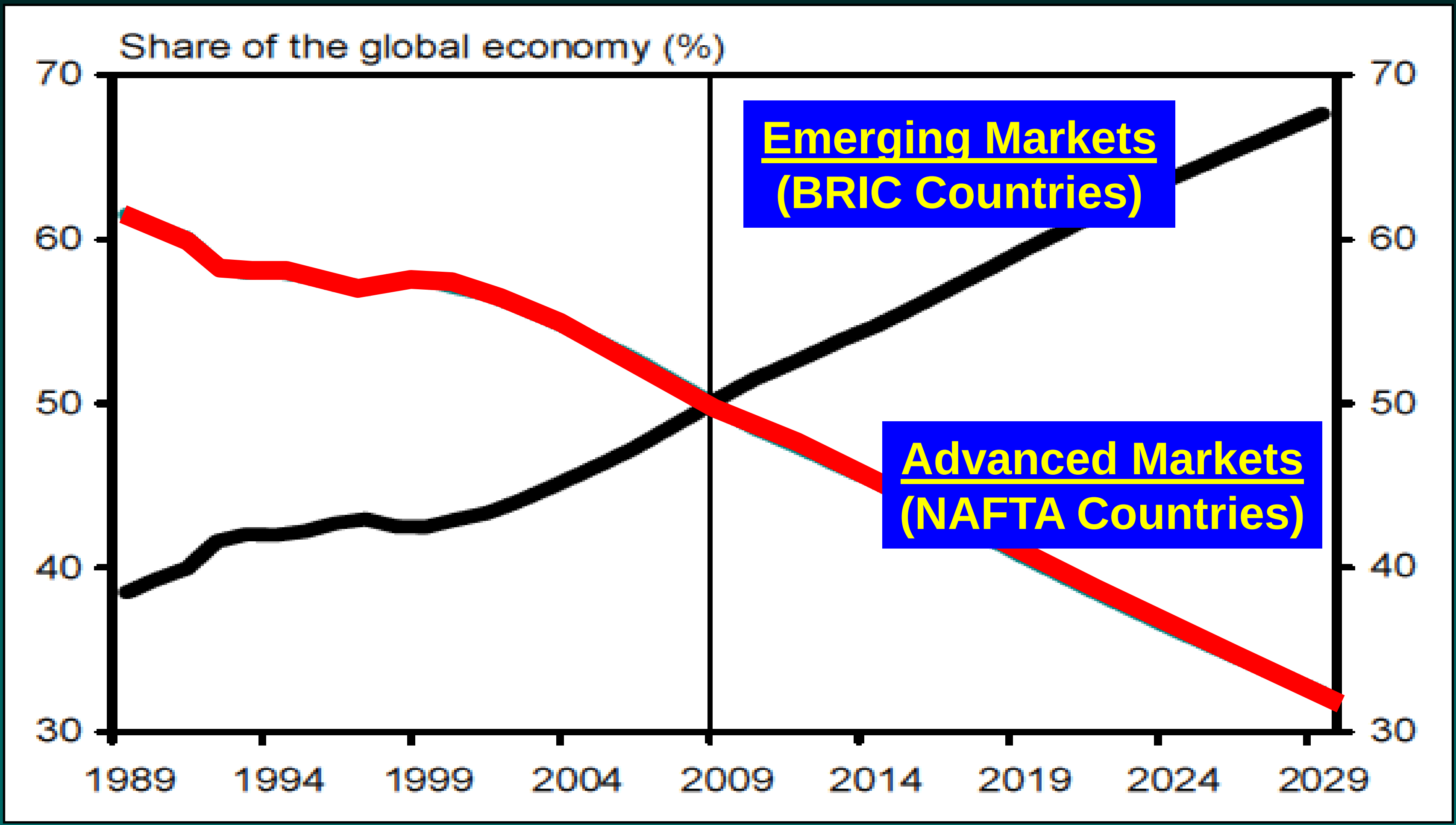
2+ Months A Year Using Convoys



VICKERMAN

A Turning Point in Global Economic History

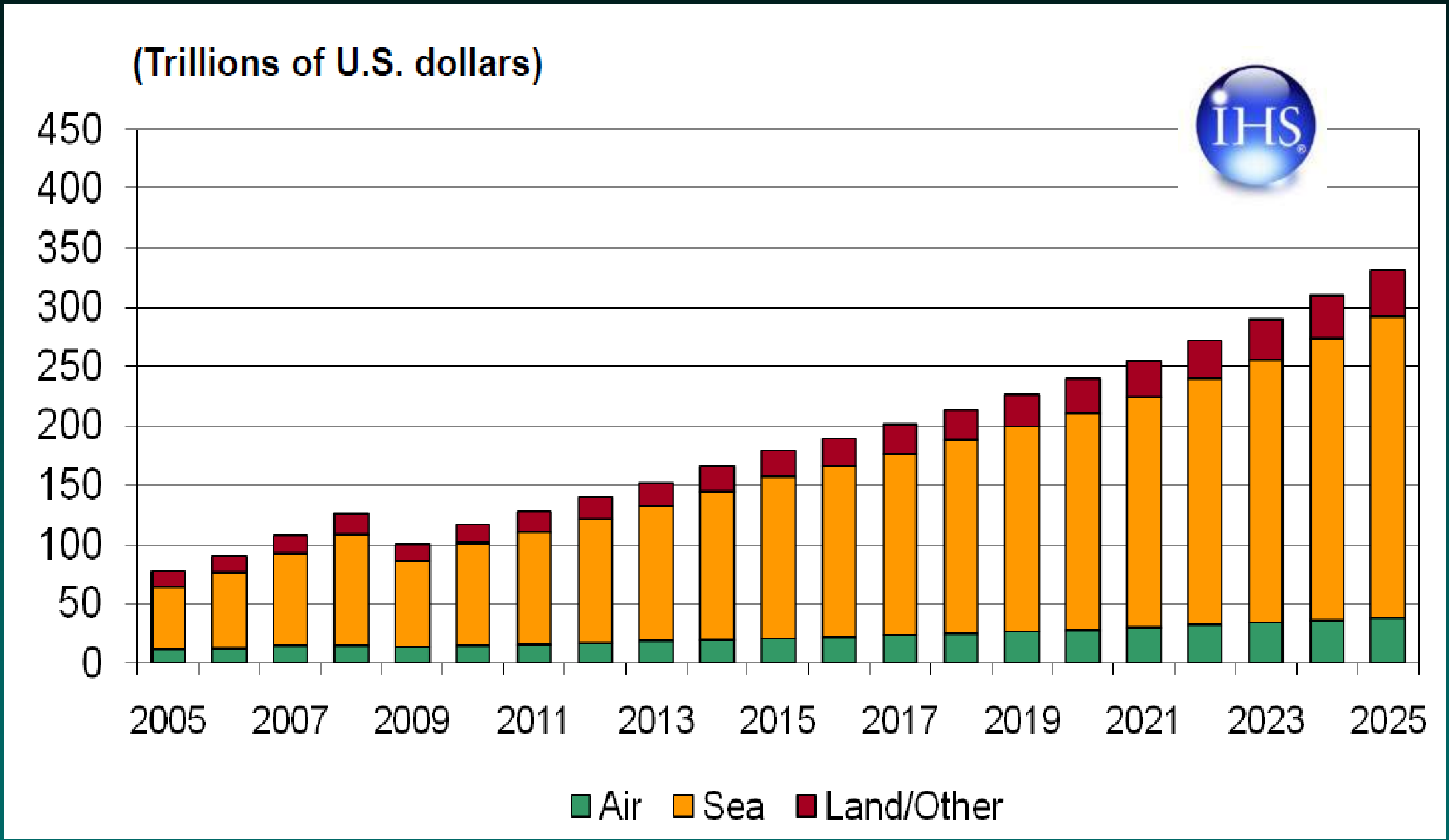
The Advanced Economies Will Decline From 2/3 share of the Global Economy to a 1/3 Global Share. The Global Economy Will See Higher Average Pace of Growth in the Future…



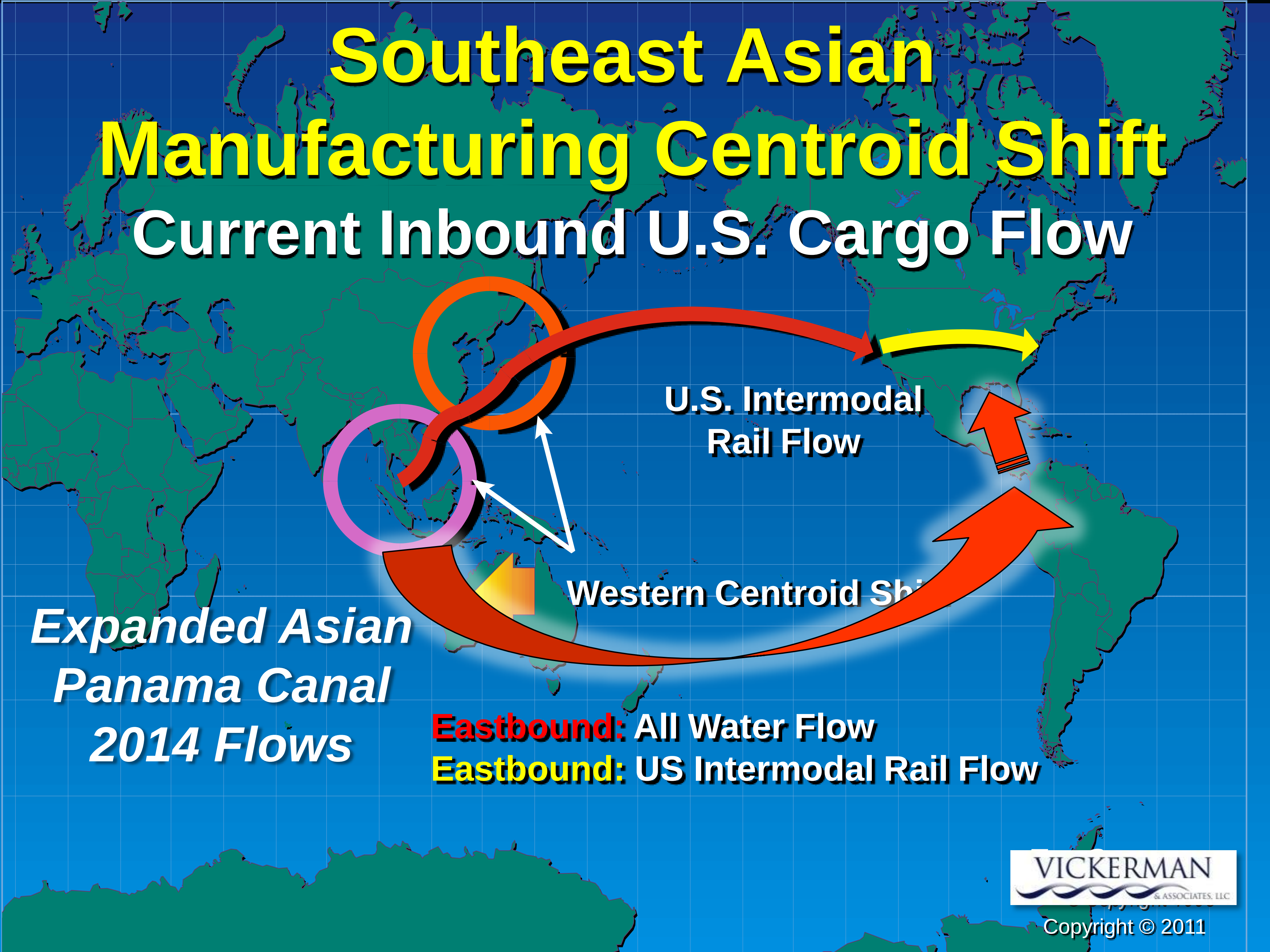
Source: IMF - Forecast by TD Economics, December 2009

Growth in Global Merchandise Trade

(Intra Europe Trade Excluded)



Source: IHS Global Insight – World Trade Service


Southeast Asian
Manufacturing Centroid Shift
Current Inbound U.S. Cargo Flow
U.S. Intermodal
Rail Flow
Western Centroid Sh
Expanded Asian
Panama Canal
2014 Flows
Eastbound: All Water Flow
Eastbound: US Intermodal Rail Flow
VICKERMAN
& ASSOCIATES, LLC
Copyright © 2011

Southeast Asian Manufacturing Centroid Shift

Cu Flow

U.S. In
Rail Fl

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

VICKERMAN & ASSOCIATES, LLC

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.

VICKERMAN

The Growing Asian Import Trade Challenge

China Breaks Container World Records

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.

The World's Top 20 Ports Posted a 15.1% Volume Growth in 2010

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

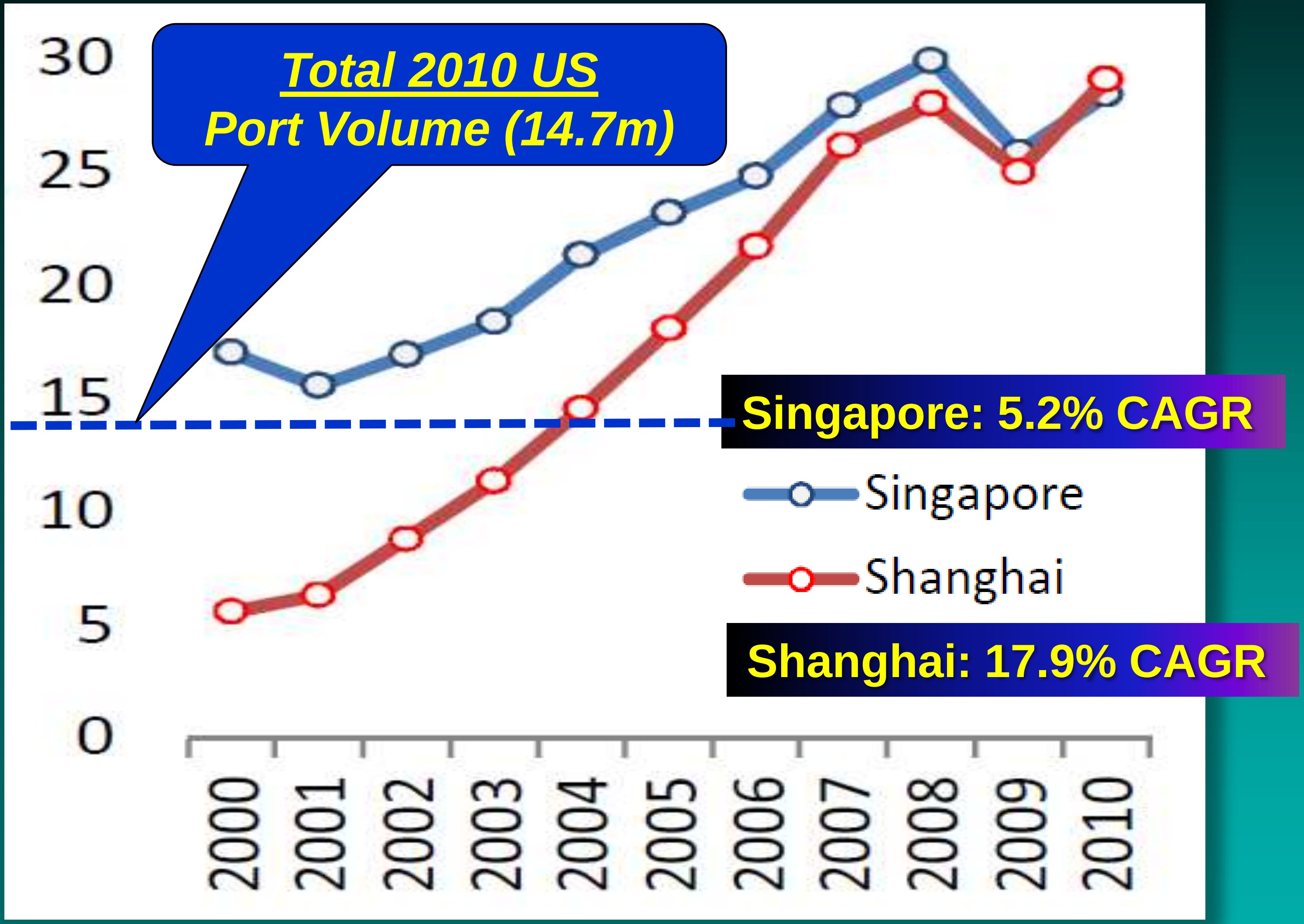
Chinese Ports

Source: Alphaliner Newsletter Volume 2011 Issue 5

VICKERMAN

Singapore vs. Shanghai Container Volumes

2000 through 2010 Volumes in Millions of TEUs



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)

VICKERMAN

Global Market Economic Shifts

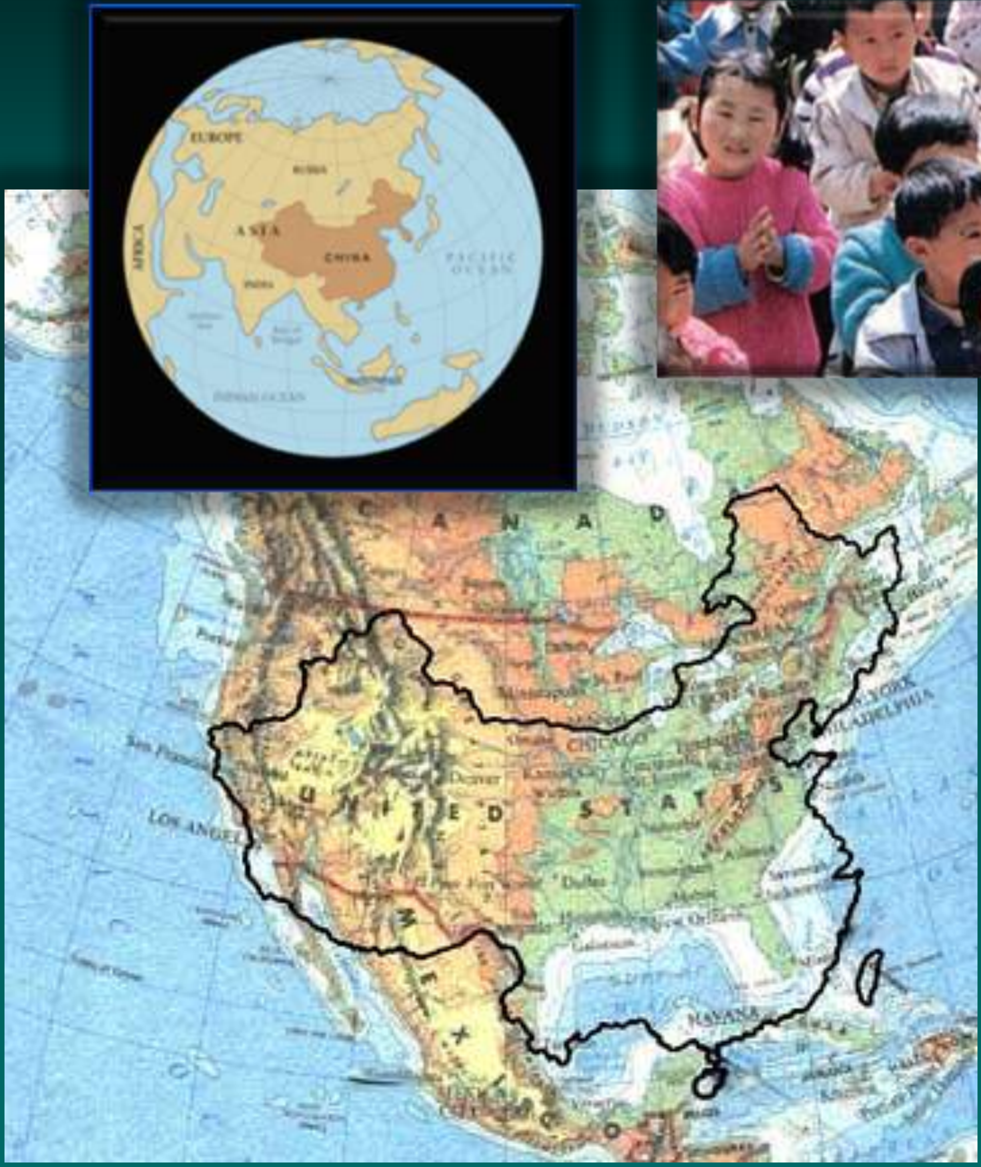
	2000	2010	2020	2030	2040	2050	
#1	USA/CA	USA/CA	USA/CA	USA/CA	USA/CA	CHINA	#1
	Japan	Japan	CHINA	CHINA	CHINA	USA/CA	#2
	Germany	Germany	Japan	Japan	INDIA	INDIA	#3
							#5
							#6
#7							
#8	Brazil	INDIA	Russia	France	Germany	Germany	
#9	INDIA	Russia	Italy	Brazil	France	France	
	Russia	Brazil	Brazil	Italy	Italy	Italy	

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

Source: HIS Global Insight

VICKERMAN

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

20 Mile New Port Access Bridge Constructed in 3 yrs

VICKERMAN

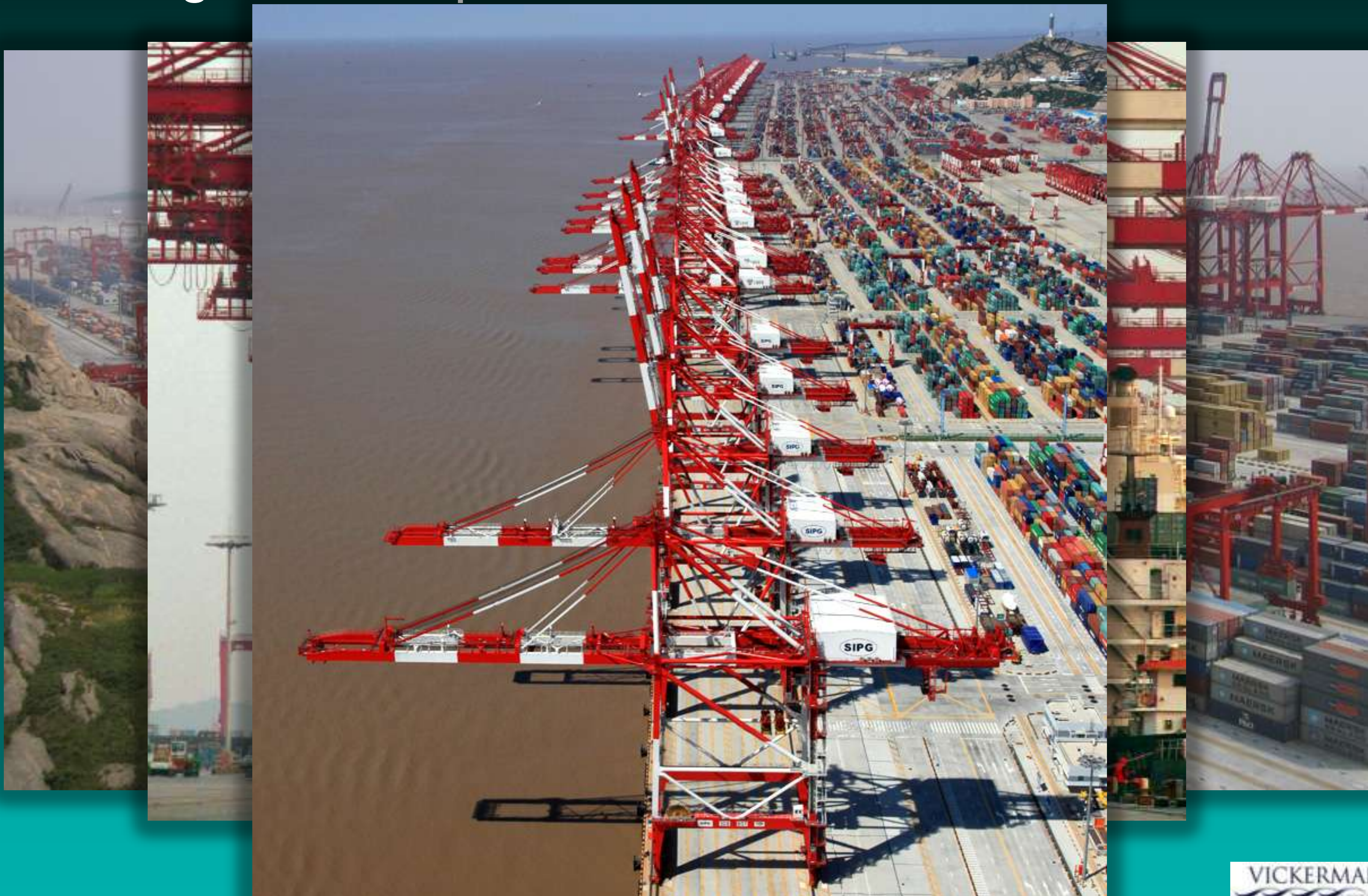
Shanghai International Shipping Center

Yangshan Deep Port - 20 Mile Bridge Access

VICKERMAN

Shanghai Yangshan Deep-Water Harbour

Yangshan Deep Port – 54 Berths East China Sea



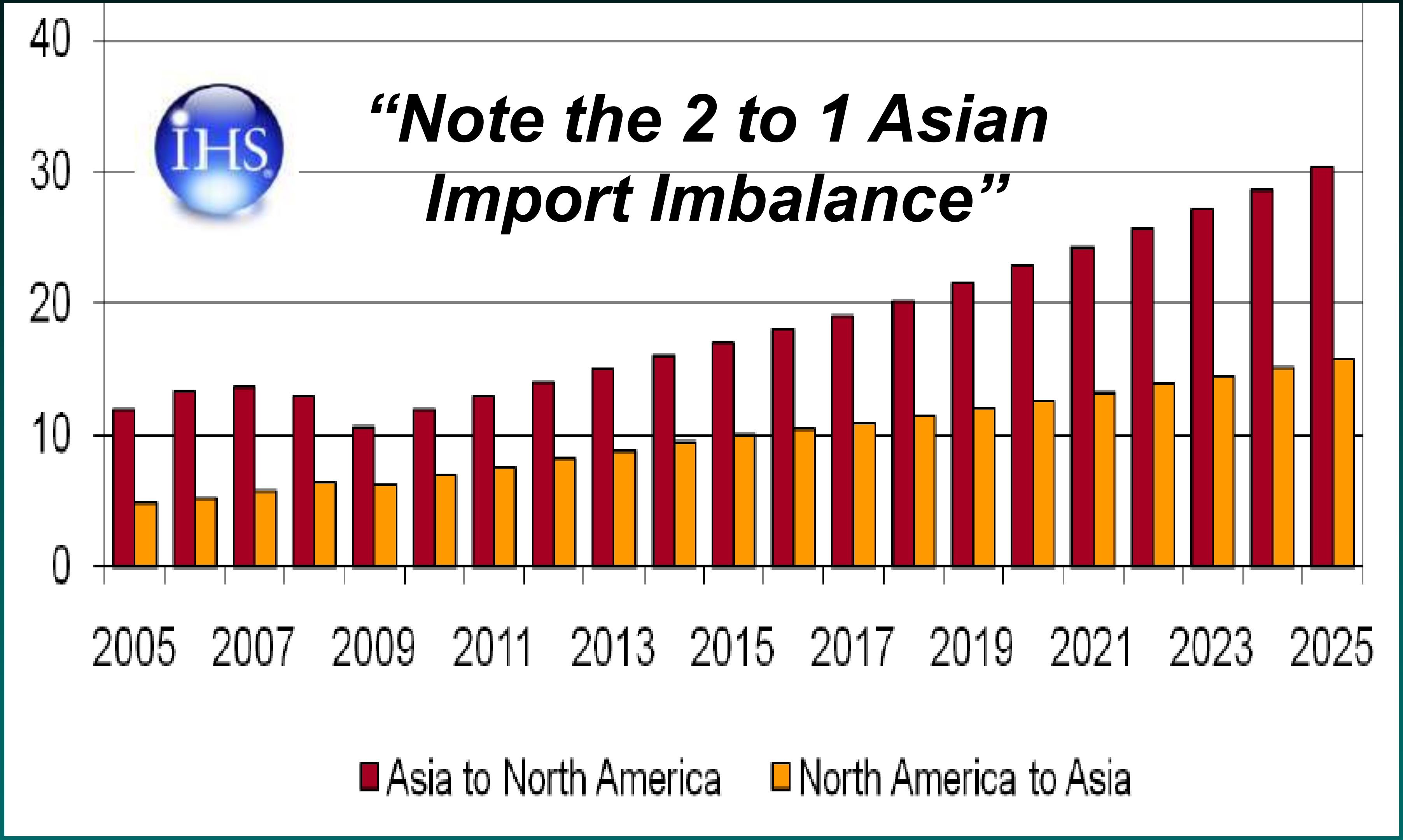
North American Cargo Demand Trends

(Dé jà vu Experience)

VICKERMAN

Transcapific Container Trade Recovery

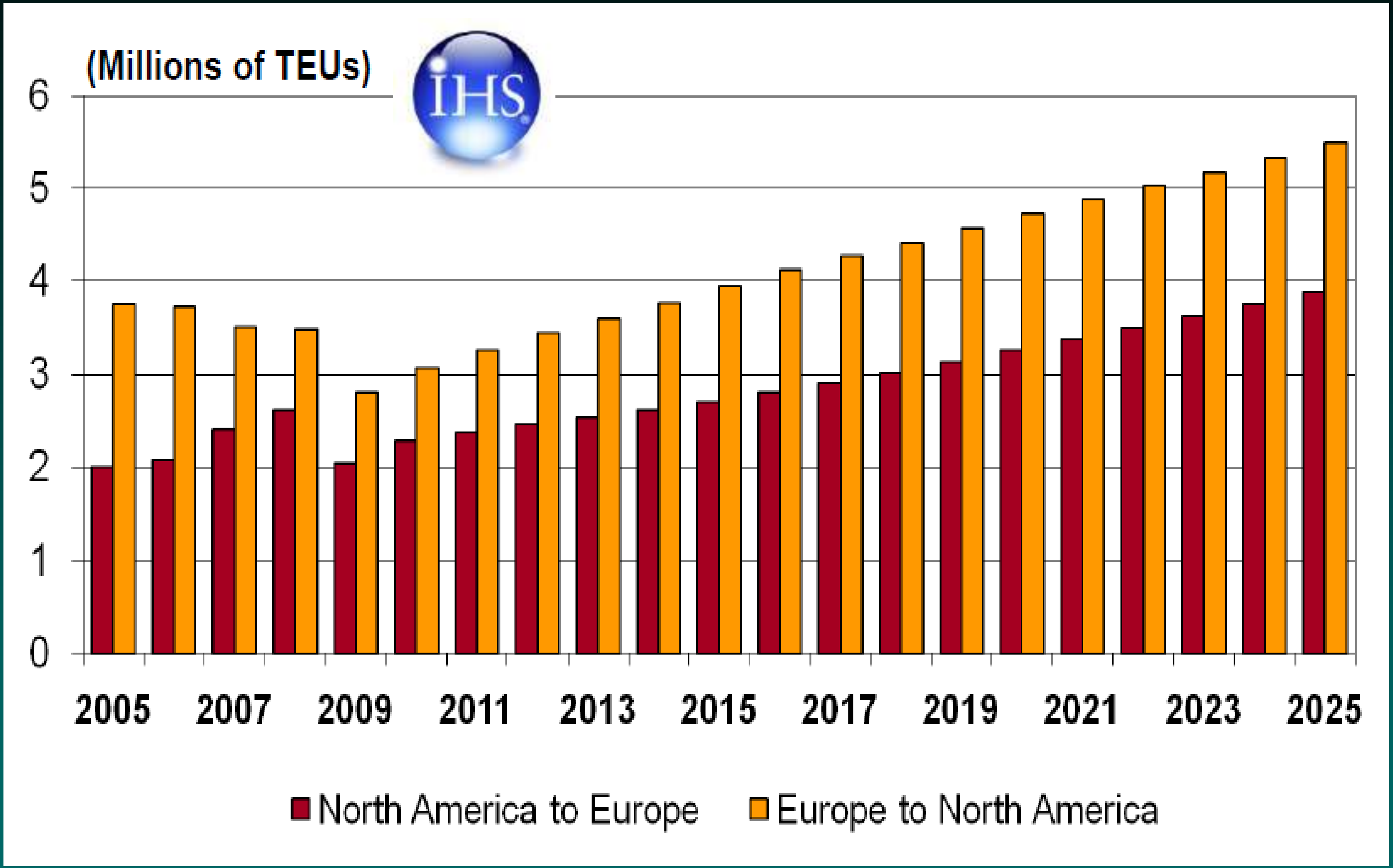
(Millions of TEUs)



Source: IHS – Global Insight -The Global Outlook – October 14, 2010

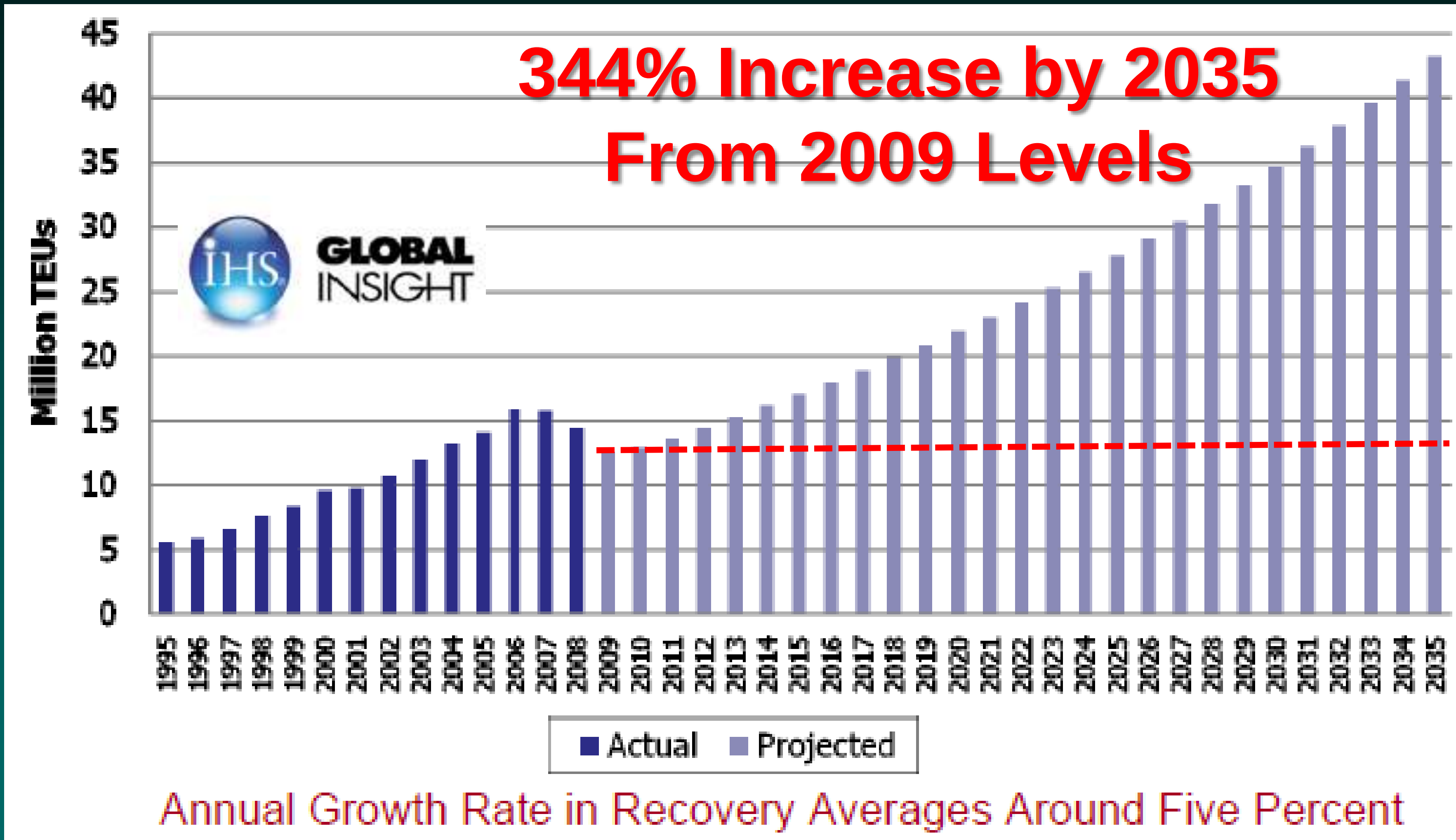
VICKERMAN

Transatlantic Container Trade Recovery



Source: IHS – Global Insight -The Global Outlook – October 14, 2010

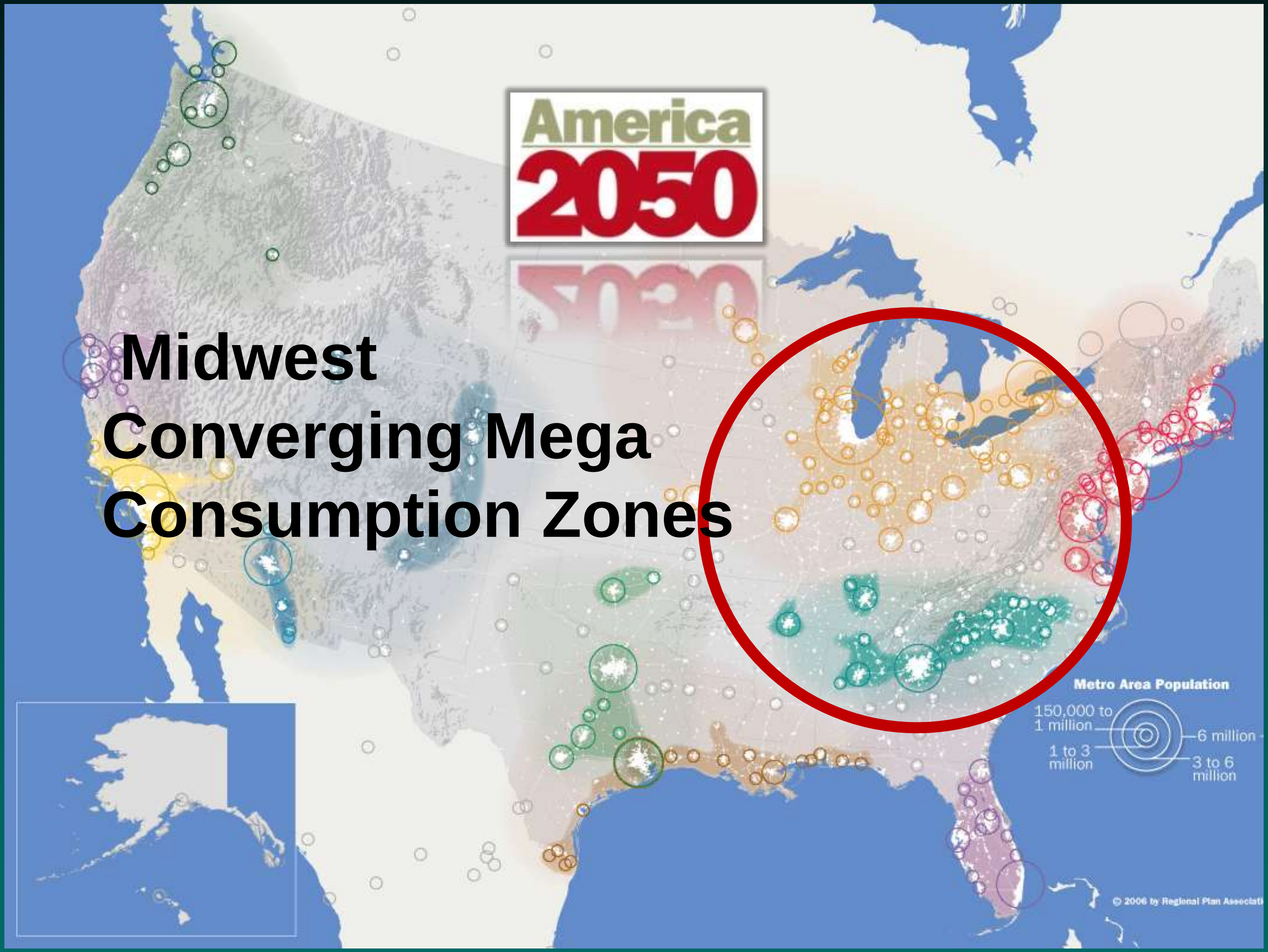
San Pedro Bay (POLA +POLB) Container Volume Forecast



Source: IHS Global Insight 2010 Forecast

North American Emerging Mega-Regions

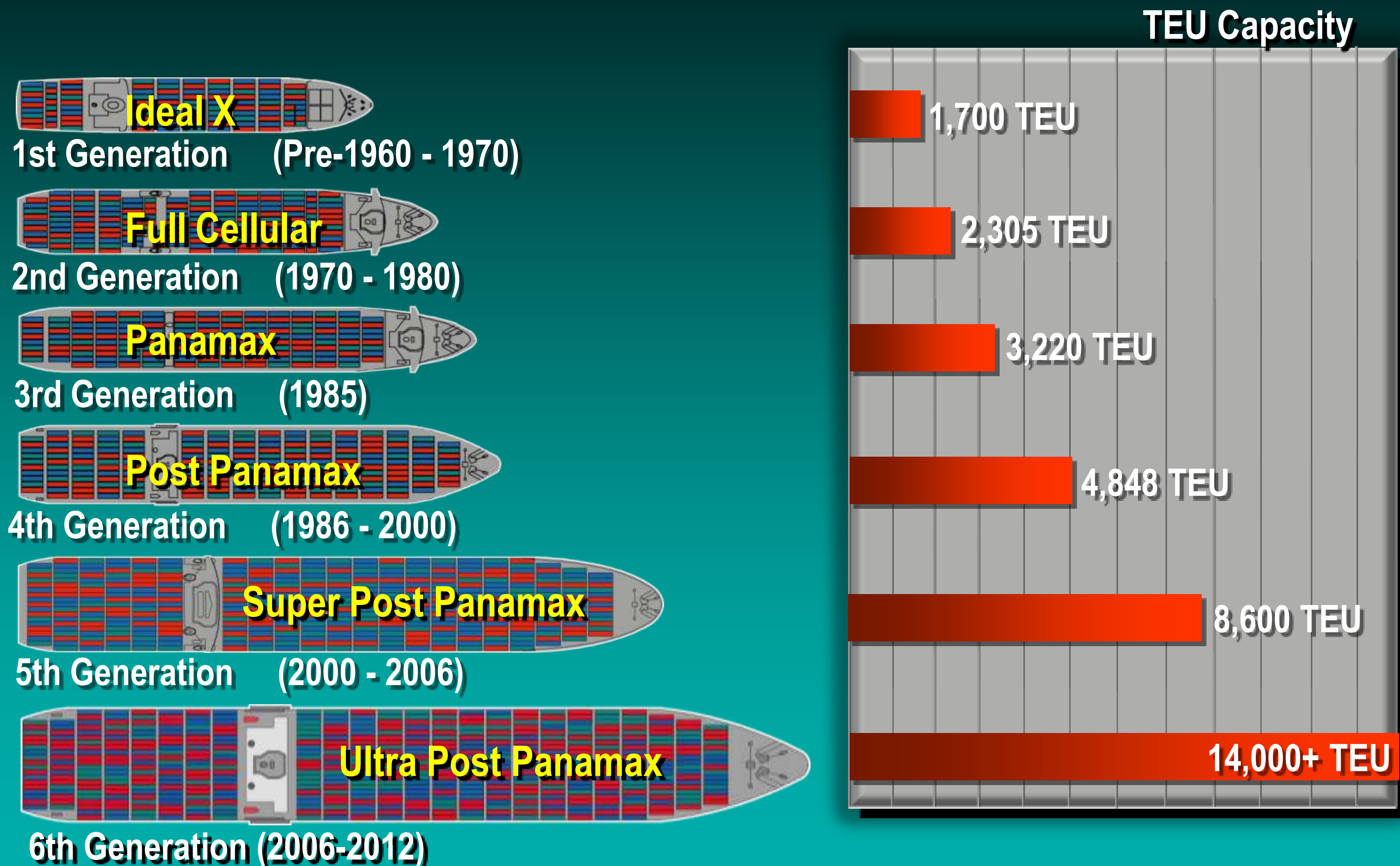
Future US Growth Areas



Source: America 2050 Prospects - Regional Plan Association

Maritime Vessel Technology Trends

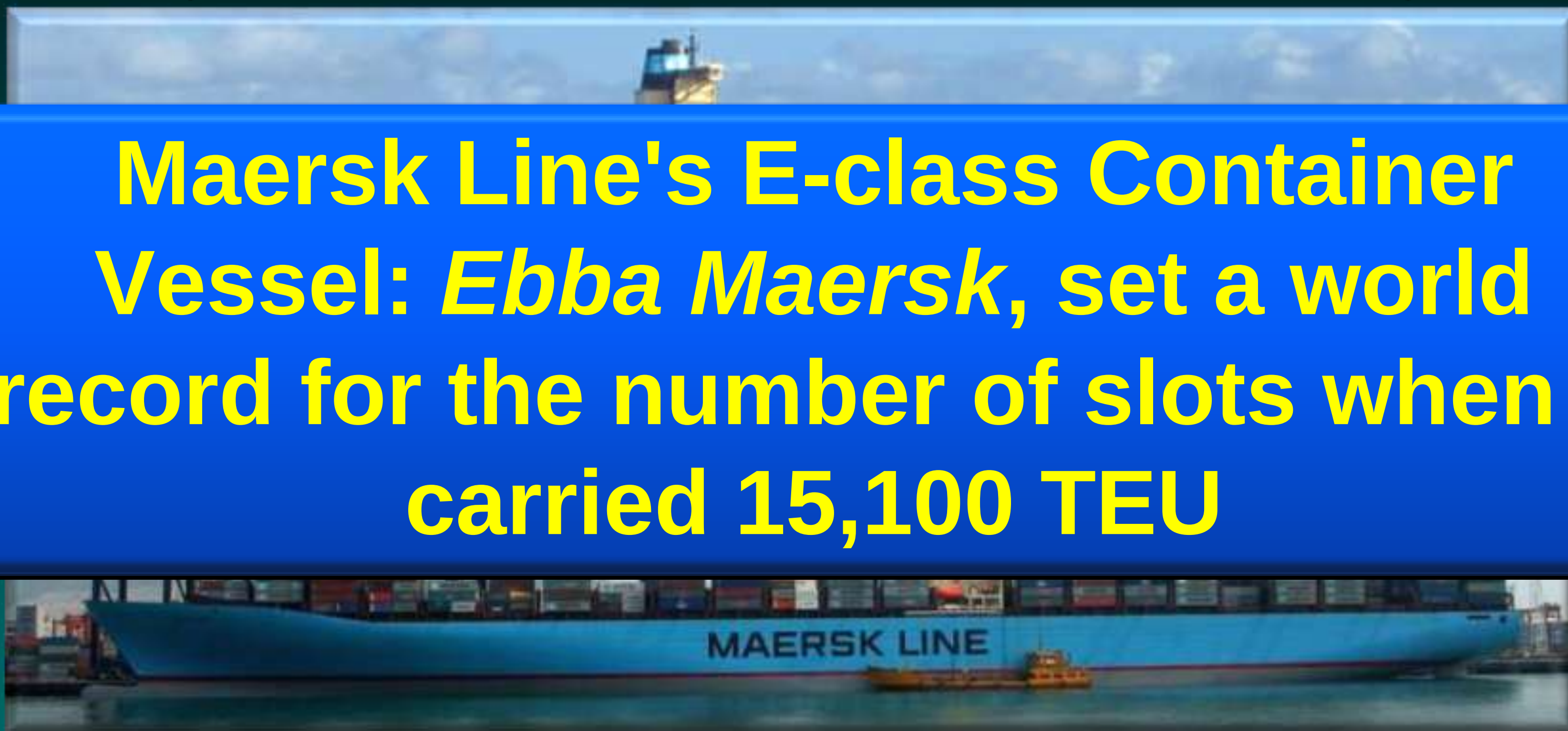
World Container Ship Evolution



MAERSK

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

(15,000 TEU Vessel - 22 Containers Wide)



Maersk Line's E-class Container Vessel: *Ebba Maersk*, set a world record for the number of slots when it carried 15,100 TEU

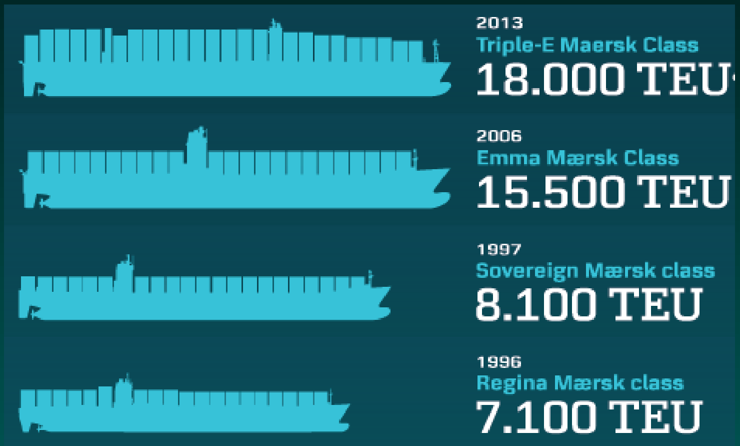
Length: 1,302 ft, Width: 207 ft, Net Cargo: 123,200 tons
Quay Cranes: 10, Engine: 14 in-line cylinders diesel engine (110,000 BHP)
Cruise Speed: 31 mi/h, Full Crew: 13, Construction cost - US $145 M+

Source: Maritime World Logistics Inc. January 2007

VICKERMAN

MAERSK LINE, LIMITED

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

VICKERMAN

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

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***

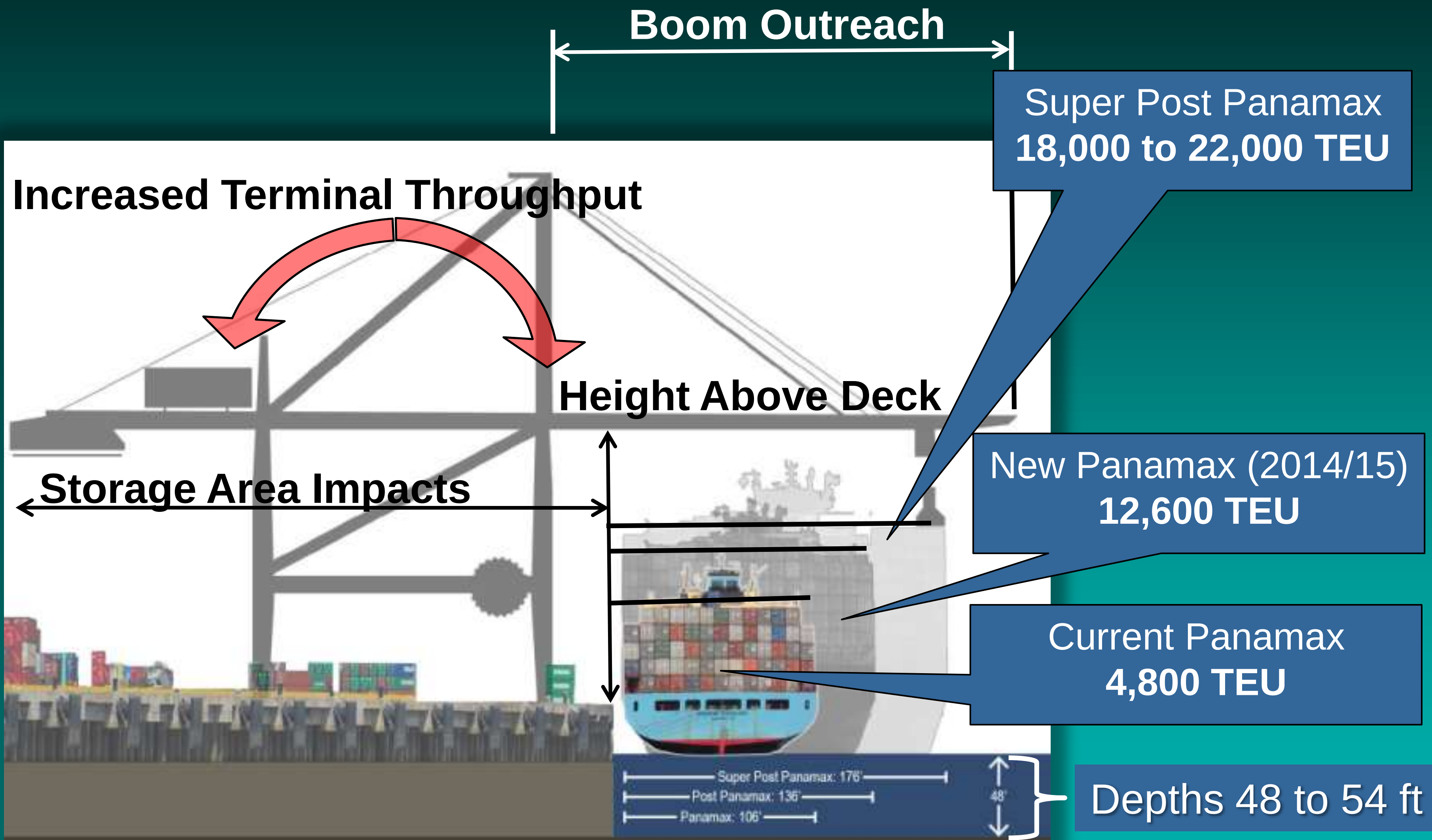
*Draft = up to **54 ft***

Far Exceeds the 2014/15 Panama Third Lane Capacity

VICKERMAN

Vessel Size Expansion - Terminal Impacts

(Port Terminal Infrastructure & Equipment Geometry Impacts)



Source: Georgia Ports Authority and Vickerman & Associates

VICKERMAN

NYK Super Eco Ship

NYK Super Eco Ship

Panama Canal Expansion: New Capacity

Panama Canal Today

The Autoridad Del Canal de Panama

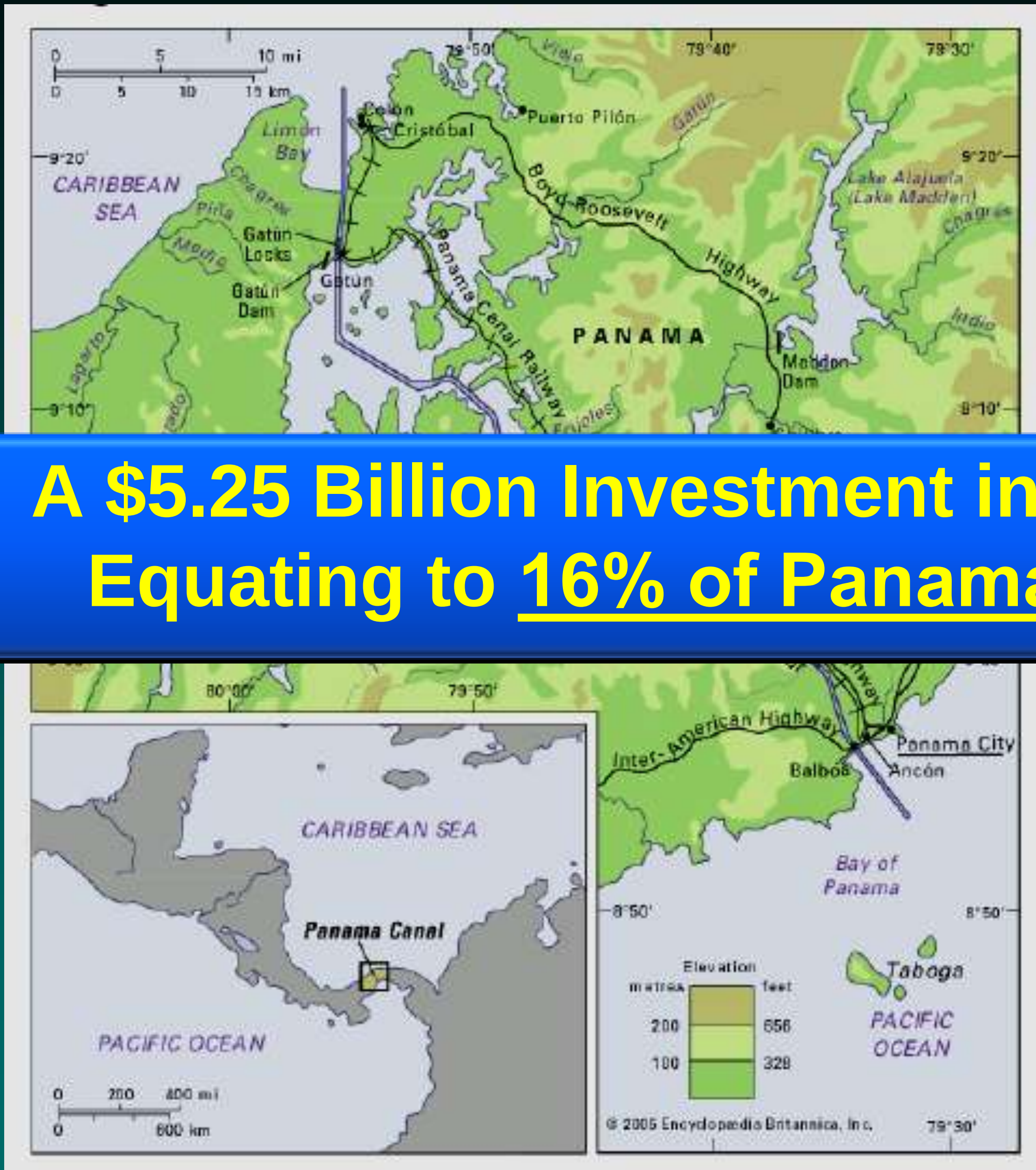
Panama Canal Third Lane Expansion Circa December 2014/January 2015

The Panama Canal will more than Double Its Capacity by 2014

Post 2014 Panama Canal

The Autoridad Del Canal de Panama

Panama Canal Expansion



ACP

The Autoridad Del Canal de Panama

More than **14,000 ships** a year pass through the **50 mile**

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

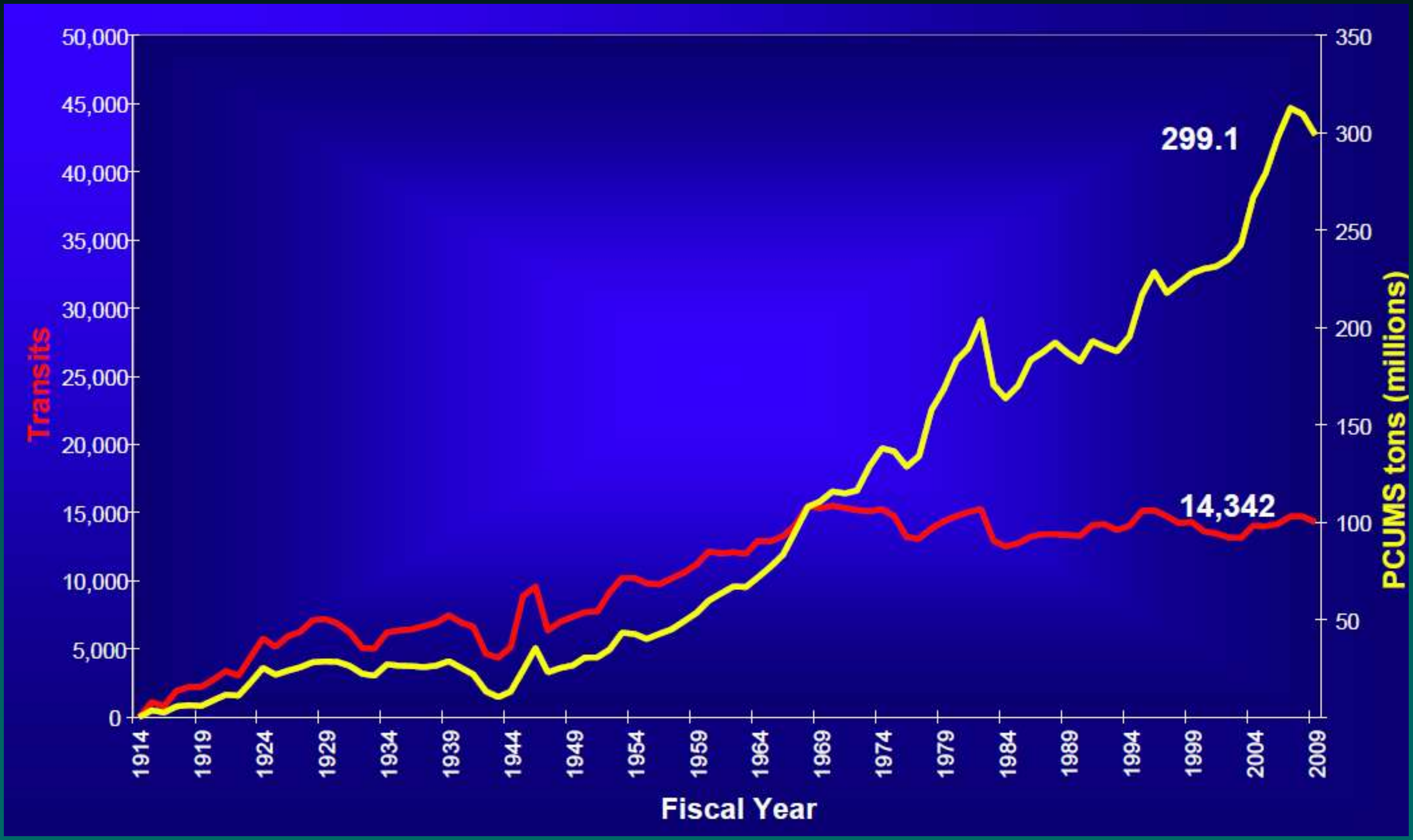
Pacific Ocean & Caribbean Sea carrying **275 million tons of Cargo and $100 billion in container shipping**

Source: ACP Data

VICKERMAN

Panama Canal Transit & Tonnage Traffic

(Transits and PCUMS Tonnage 1914 to 2009)

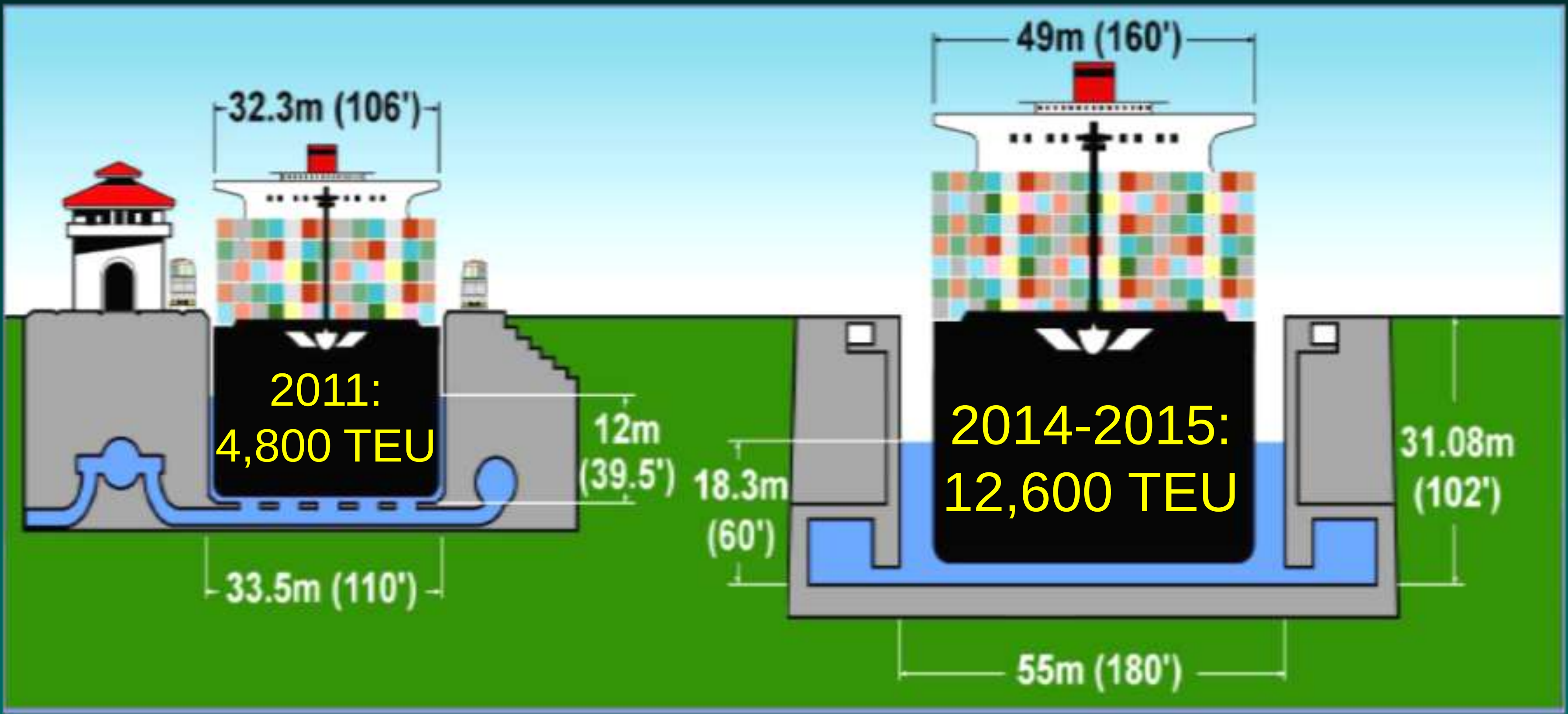


Source: ACP Data

VICKERMAN

The Autoridad Del Canal de Panama

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**

VICKERMAN

The Container Ship Colombo Express (8750 TEU)

VICKERMAN

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)

ACP

Summary of the Expanded Canal's Financial Results

Financial Results[1]	Year 2005	Year 2025	Annual average growth rate
PCUMS Tons[2]	279	508	3.0%
Transit Revenue	[illegible]	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[3]	218	668	6.5%
Public Services Fees[3]	2	2	0.0%
Depreciation	61	231	6.8%
Net Income	[illegible]	**4,310**	**11.6%**

546% Increase

890% Increase

Source: ACP Financial Data

VICKERMAN

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.

VICKERMAN

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

VICKERMAN

Panama Maritime Authority Becomes A Major Transhipment Center

Source: Panama Maritime Authority

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 <u>Competitive & Robust</u> Landside Access to the Gateway Port's <u>Inland Market</u> 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

VICKERMAN

$47 million Tiger II Port of Miami – FEC On-Dock Intermodal Container Transfer Terminal

Exhibit 1 Summary of Project Construction and Total Cost (*)	($)
Item	**Cost**
Bridge Reconstruction	$3,500,000
POM Rail Intermodal Apron	$15,284,000
POM Intermodal Rail Line Tracks	$3,983,000
Port Lead (4.40 miles)	$21,840,800
Total Cost of Construction	**$44,607,800**
Equipment Purchase	$2,300,000
Total Rail and Intermodal Facility Project Cost	**$46,907,800**

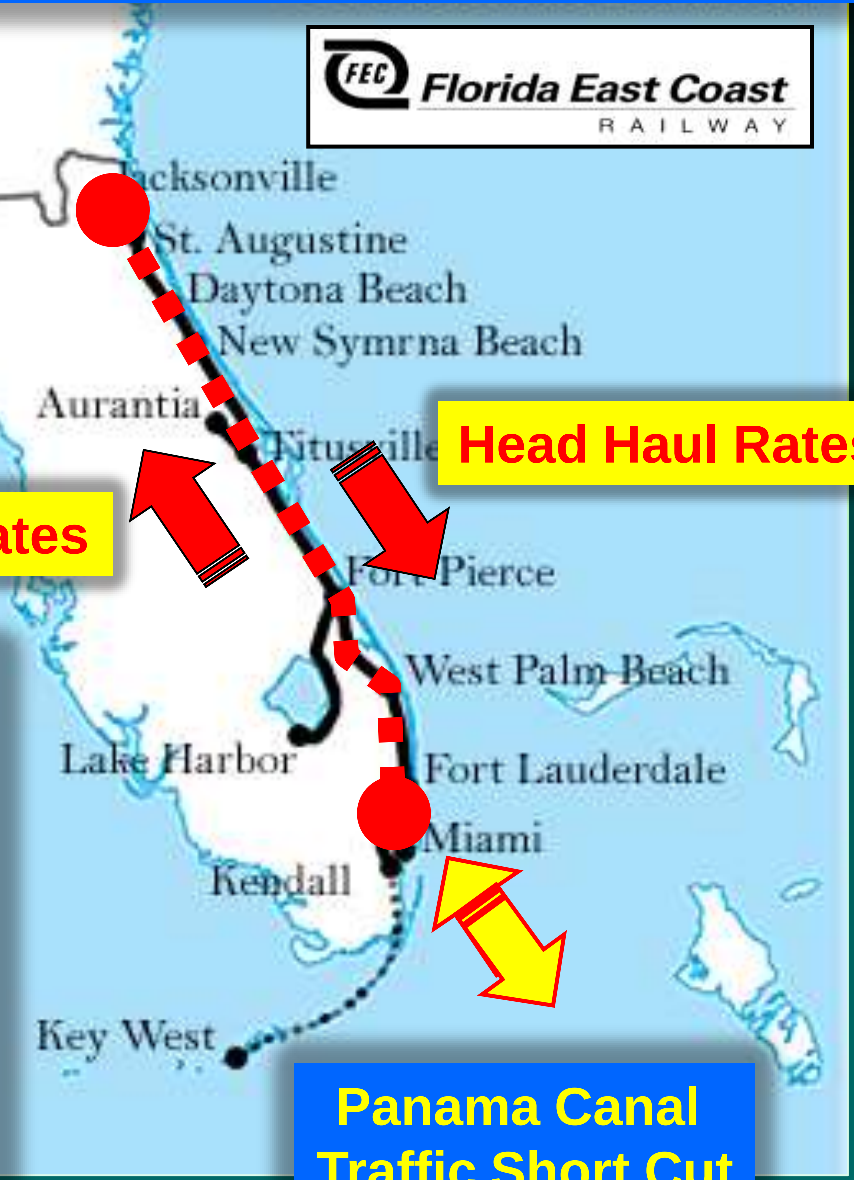
(*)A detailed analysis of these costs is included in the Appendix "F"

VICKERMAN

Panama Canal Vessel Deployments Will Determine New US Logistics Patterns

The Round trip Distance to Miami Via the Panama Canal is Could Substantially Cut the North American Delivery Costs….

Dedicated *Express* Double Stacked Train Service



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…**

VICKERMAN

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!**

Panel I:

North American Economic Trade Outlook for the Port Industry

Thank You